

areas with poor air quality by using CASTNET to track local air quality and assess how pandemic-related policies and changes in economic activity have affected air quality.

EPA works closely with tribal governments to build tribal air monitoring capacity through partnerships with the CASTNET program. Since 2002, CASTNET has added seven sites on tribal lands, including two new sites in the northwest U.S. By expanding tribal partnerships, CASTNET can fill important spatial gaps in ambient and deposition monitoring while simultaneously integrating sites operated by tribes into a national program. Tribes will benefit from dedicated tribal monitoring sites that build tribal technical skills, provide near-real time air quality data to the community, and provide environmental data that help tribes assess the impacts of air pollution on cultural or natural resources on tribal lands.

To support modernization efforts, CASTNET will use the existing network infrastructure to fill in gaps in continuous measurements necessary to evaluate changes in atmospheric chemistry and global climate impacts on air quality and deposition. The Program is well-situated to measure background or regional levels of air toxics (e.g., ethylene oxide) and persistent chemicals of concern (e.g., PFAS compounds). Measuring speciated reactive nitrogen will provide valuable data that states can use to determine which species are driving PM formation and make more informed decisions on emission control strategies. Furthermore, continuing to expand capacity while modernizing the CASTNET infrastructure ensures data can be made available in near-real time to address short-term changes in air quality resulting from meteorological conditions, such as temperature inversions, or natural disasters, such as wildfires.

This program also is responsible for managing EPA's Long-Term Monitoring (LTM) program, which was created to assess the health of lakes and streams in response to changes in deposition of atmospheric pollutants. Today, it ensures that the Clean Air Act continues to be effective in reducing the impact of atmospheric pollutants (e.g., strong acid anions) on surface waters in New England, the Adirondack Mountains, the Northern Appalachian Plateau (including the Catskill mountains), and the Blue Ridge region. This program is operated cooperatively with partners in state agencies, academic institutions, and other federal agencies. The LTM surface water chemistry monitoring program provides field measurements for understanding biogeochemical changes in sulfur, nitrogen, acid neutralizing capacity, aluminum, and carbon in streams and lakes in relation to reductions in pollutant emissions and a changing climate. The LTM program is one of the longest running programs at EPA, providing a longitudinal dataset based on sampling and measurements since 1983.

This program also supports the Clean Air Allowance Trading Programs, which are nationwide and multi-state programs that address air pollutants that are transported across state, regional, and international boundaries. Programs designed to control SO₂ and NO_x include Title IV (the Acid Rain Program) of the Clean Air Act, the Cross-State Air Pollution Rule (CSAPR), the CSAPR Update (which was revised in 2021 in response to a court remand). The infrastructure for the Clean Air Allowance Trading Programs also supports implementation of other state and federal programs to control SO₂, hazardous air pollutants, and greenhouse gases.

Both the CSAPR and the CSAPR Update Rule require 27 states in the eastern U.S. to limit their emissions of SO₂ and/or NO_x in order to reduce or eliminate the states' contributions to fine

agencies to ensure that particulate matter (PM) hot-spot analyses are conducted in a manner consistent with the transportation conformity regulation and guidance.

One of EPA's priorities is to fulfill its statutory and court-ordered obligations. In FY 2023, EPA will continue to conduct the periodically required "technology reviews" of NESHAP and conduct required risk assessments for MACT-based NESHAP. EPA will enhance risk assessment capabilities to better identify and determine impacts on communities. The Agency also will transition to an approach to share air toxics data faster and more regularly to the public, allowing for increased transparency and the ability to see trends and risks over time. By 2023, EPA will start reporting the most current air toxics data each year in the annual Air Trends Report and an online interactive tool instead of the current three to four-year cycle and provide that data at increased spatial resolution. EPA will prioritize work with an emphasis on meeting court-ordered deadlines and also incorporate environmental justice considerations as part of the decision-making process.

EPA will continue to provide information and assistance to states and communities through documents, websites, webinars, and training sessions on tools to help them provide input to environmental justice assessments that can inform risk reduction strategies for air toxics. EPA will continue to communicate effectively to, and collaborate with, communities with environmental justice concerns to address air toxics issues. EPA will continue its multi-pollutant air quality management work with state and local areas, factoring environmental justice into prioritization efforts, including providing tools to support state, tribal and local governments in strategy development. EPA will continue to look at multiple pollutants in an industrial sector and identify ways to take advantage of the co-benefits of pollution control. The focus of these efforts is to address an individual sector's emissions comprehensively and to prioritize regulatory efforts to address the sources and pollutants of greatest concern to overburdened communities. In developing sector and multi-pollutant approaches, EPA is building innovative solutions that address the differing and cumulative nature of the multiple pollutants and associated industrial sectors.

In FY 2023, EPA will continue to work with internal and external stakeholders to improve ambient air quality monitoring networks and measurement techniques to fill data gaps and to provide better input to estimation of population exposure to criteria and toxic air pollutants. To ensure data quality, EPA will continue to implement and manage independent quality assurance programs for national monitoring networks as well as for federal and commercial laboratories that produce ambient air monitoring data.

In FY 2023, EPA will continue to work with partners to improve emissions factors and inventories, including the National Emissions Inventory. This effort includes gathering improved activity data from emissions monitoring and using geographic information systems and satellite remote sensing systems, where possible, for key point, area, mobile, and fugitive sources, and global emission events.

layers enabling assessment of environmental justice factors to inform response decision making.

Environmental Cleanup and Infrastructure Remediation. Remediating chemical, biological, and radiological contamination released over wide areas including indoor and outdoor areas, critical infrastructures, or impacted water systems, is a responsibility for which EPA needs to accumulate operational experience. Such a release can pose a continual challenge with long-standing consequences. Chemical, biological, and radiological environmental contamination that can impact human health and welfare can result from intentional acts or from the increasing severity and occurrence of natural disasters due to climate change. HSRP research aims to fill the most critical scientific gaps in the capabilities of EPA’s response community so that the Agency can make the most informed mitigation and remediation decisions. As the lead federal agency overseeing the water sector, EPA addresses water sector research needs identified by the Water Sector Coordinating Council and the Water Government Coordinating Council’s Critical Infrastructure Partnership Advisory Council.²³

In FY 2023, HSRP will:

- Develop decontamination methods for biological agents that can effectively minimize the risk of transmission from environmental matrices, including research useful to support reducing environmental transmission in pandemic or other naturally occurring outbreaks;
- Develop decontamination methods for chemical agent contaminated areas, including methods for non-traditional agents and opioids;
- Conduct cybersecurity research to assess the impact a cyberattack will have on the drinking water infrastructure;
- Evaluate water system security and assess resilience for wastewater, stormwater, and home plumbing;
- Assess the impact of high consequence pathogens on wastewater treatment plant operations; and
- Develop integrated waste management tools for all hazards with enhancements to estimate waste volumes and social implications of disaster waste and materials management. These tools will incorporate environmental justice data to inform decision making. These tools are developed to be applicable to debris from intentional incidents as well as natural disasters.

Community Engagement and Systems-Based Tools Supporting Resilience Equity. Transitioning research into reliable and field usable capabilities involves ensuring that decision makers and responders have knowledge of and access to the latest information. Effective technical support and decision-support tools will be developed to ensure that information is readily and easily accessible to decision makers and stakeholders throughout response and recovery efforts. In FY 2023, HSRP will:

²³ The Water Sector Coordinating Council is a “self-organized, self-run, and self-governed council” composed of water utilities. The Water Government Coordinating Council is responsible for interagency coordination of efforts related to the water sector.

Statutory Authority:

Intelligence Reform and Terrorism Prevention Act of 2004; Homeland Security Act of 2002; Reorganization Plan No. 3 of 1970, 84 Stat. 2086, as amended by Pub. L. 98–80, 97 Stat. 485 (codified at Title 5, App.) (EPA’s organic statute).

EPA's Quality Program provides support to all EPA organizations that have environmental information operations described in an approved Quality Management Plan (QMP) in implementing EPA's Quality Program. In FY 2023, the Quality Program will:

- Assess organizations that have an approved QMP and identify findings requiring corrective action, areas needing improvement, and leveraging best practices.
- Focus on promoting sound science and ensure scientific integrity by promoting better planning to produce improved environmental information. Evaluate environmental information through use of the QA Annual Report and Work Plan and annual certification by Assistant and Regional Administrators.
- Manage and provide oversight for the IQGs to ensure that information disseminated by or for EPA conforms with the *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility and Integrity of Information Disseminated by the Environmental Protection Agency*²⁹ criteria. The Quality Program will facilitate the development of the Agency's responses to public requests for correction and reconsideration of information disseminated by EPA and report this information to the Office of Management and Budget (OMB). The Quality Program also will continue to focus on implementing recommendations from the Office of Inspector General (OIG) Audit Report, *EPA Needs to Address Internal Control Deficiencies in the Agencywide Quality System*.³⁰ The Program will give priority to implementation of revised Quality Directives for QMPs and Quality Assurance Project Plans, and the IQGs.
- Engage as a resource with EPA's state and tribal partners and environmental justice communities and support the Climate Change Program to ensure QA processes and procedures are in place to protect human health and the environment.

The Agency's S&T resources for IT/DM also will help provide library services through the EPA National Library Network to all EPA employees and environmental information access to the public, as well as support the hosting of EPA's websites and web pages. One EPA Web will continue to manage content and support internal and external users with information on EPA business, support employees with internal information, and provide a clearinghouse for the Agency to communicate initiatives and successes.

In FY 2023, EPA will work to transform the Agency's libraries to meet the needs of the 21st Century. This involves operating in an increasingly online and mobile environment; providing services and resources at the customer's point of need; prioritizing the thorough assessment of print materials to support strategic space usage; utilizing detailed data to ensure print collections are highly relevant to the Agency's needs and centralizing core services; and relying on technology and a team of professional librarians to disseminate information and connect people to resources they need to support the demands of both internal and external requests.

²⁹ For more information, please see: <https://www.epa.gov/quality/guidelines-ensuring-and-maximizing-quality-objectivity-utility-and-integrity-information>.

³⁰ For more information, please see: <https://www.epa.gov/office-inspector-general/report-epa-needs-address-internal-control-deficiencies-agencywide-quality>.

Performance Measure Targets:

EPA's FY 2023 Annual Performance Plan does not include annual performance goals specific to this program.

FY 2023 Change from FY 2022 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$123.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs. This change also includes program increases for critical IT infrastructure and data management programs.

Statutory Authority:

Reorganization Plan No. 3 of 1970, 84 Stat. 2086, as amended by Pub. L. 98–80, 97 Stat. 485 (codified at Title 5, App.) (EPA's organic statute); Federal Information Technology Acquisition Reform Act; Federal Information Security Modernization Act (FISMA); Government Performance and Results Act (GPRA); Government Management Reform Act (GMRA); Clinger-Cohen Act (CCA); Rehabilitation Act of 1973 § 508.

Operations and Administration

Facilities Infrastructure and Operations
Program Area: Operations and Administration
Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2021 Final Actuals	FY 2022 Annualized CR	FY 2023 President's Budget	FY 2023 President's Budget v. FY 2022 Annualized CR
Environmental Programs & Management	\$257,524	\$285,441	\$288,293	\$2,852
Science & Technology	\$65,093	\$67,500	\$68,912	\$1,412
Building and Facilities	\$36,071	\$27,076	\$73,894	\$46,818
Leaking Underground Storage Tanks	\$932	\$836	\$724	-\$112
Inland Oil Spill Programs	\$628	\$682	\$641	-\$41
Hazardous Substance Superfund	\$81,976	\$68,727	\$71,219	\$2,492
Total Budget Authority	\$442,223	\$450,262	\$503,683	\$53,421
Total Workyears	334.2	315.4	325.4	10.0

Total workyears in FY 2023 include 5.4 FTE to support Facilities Infrastructure and Operations working capital fund (WCF) services.

Program Project Description:

Science and Technology (S&T) resources in the Facilities Infrastructure and Operations Program fund the Agency's rent, utilities, and security. The Program also supports centralized administrative activities and support services, including health and safety, environmental compliance and management, facilities maintenance and operations, space planning, sustainable facilities and energy conservation planning and support, property management, mail, and transportation services. Funding for such services is allocated among the major appropriations for the Agency.

FY 2023 Activities and Performance Plan:

Work in this program provides Cross-Agency Mission and Science Support and is allocated across strategic goals and objectives in the *FY 2022 - 2026 EPA Strategic Plan*.

In FY 2023, the Agency requests an investment of approximately \$1.4 million to support agencywide climate sustainability and resiliency initiatives and EPA facilities projects. EPA will continue to invest in the reconfiguration of EPA's workspaces, enabling the Agency to release office space and avoid long-term rent costs, consistent with HR 4465,³¹ the *Federal Assets Sale and Transfer Act of 2016*. EPA is implementing a long-term space consolidation plan that aims to reduce the number of occupied facilities, consolidate and optimize space within remaining facilities, and reduce square footage wherever practical. EPA also will continue working to enhance its federal infrastructure and operations in a manner that increases efficiency. For FY

³¹ For additional information, please refer to: <https://www.congress.gov/bill/114th-congress/house-bill/4465>, *Federal Assets Sale and Transfer Act of 2016*.

2023, the Agency is requesting \$29.45 million for rent, \$17.23 million for utilities, and \$11.58 million for security in the S&T appropriation. EPA uses a standard methodology to ensure that rent charging appropriately reflects planned and enacted resources at the appropriation level.

EPA also will work to secure physical and operational resiliency for agency facilities. As part of this work, EPA will continue conducting climate resiliency assessments at all EPA-owned facilities to identify critical upgrades that are necessary to improve facility resiliency against the impacts of climate change, such as roofing stability or seawall construction projects. In FY 2023, EPA will conduct climate assessments at the following facilities: Cincinnati Test and Evaluation Facility, Duluth Environmental Center, Ada Gaar Corner, Ada Environmental Research Center, Region 10 Laboratory – Manchester. EPA will initiate all high-priority projects within 24 months of the completion of a climate assessment.

Further, EPA will continue reconfiguring EPA’s workplaces with the goal of reducing long-term rent costs while increasing EPA facility sustainability to combat the effects of climate change and ensuring a space footprint that accommodates a growing workforce. Space reconfiguration enables EPA to reduce its footprint to create a more efficient, collaborative, and technologically sophisticated workplace. However, even if modifications are kept to a minimum, each move requires initial funding to achieve long-term cost avoidance and sustainability goals. These investments support sustainable federal infrastructure, a clean energy future, and goals to achieve net-zero emissions by 2050.

In FY 2023, EPA will pursue aggressive energy, water, and building infrastructure requirements with emphasis on environmental programs (e.g., Environmental Management Systems, Environmental Compliance Programs, Leadership in Energy and Environmental Design Certification, alternative fuel use, fleet reductions, telematics, sustainability assessments). This investment in infrastructure (e.g., architectural and design) and mechanical systems (e.g., electrical, water/steam, HVAC) is necessary to meet the Administration’s climate sustainability goals. Additionally, in 2023, EPA will continue to transition to electric vehicles through direct purchase (mobile lab vehicles) or lease through General Services Administration (GSA) for all future fleet procurements where economically feasible. EPA also will identify opportunities to build out necessary charging infrastructure at EPA facility locations. EPA’s goal is to use 100 percent carbon pollution-free electricity on a net annual basis by 2030.

EPA also will meet regulatory Occupational Safety and Health Administration (OSHA) obligations and provide health and safety training to field staff (e.g., inspections, monitoring, on-scene Coordinators), and track capital equipment of \$25 thousand or more. The Agency will continue its partnership with GSA to utilize shared services solutions, *USAccess*, and Enterprise Physical Access Control System (ePACS) programs. *USAccess* provides standardized HSPD-12 approved Personal Identity Verification (PIV) card enrollment and issuance and ePACS provides centralized access control of EPA space, including restricted and secure areas.

Performance Measure Targets:

Work under this program supports performance results in the Facilities Infrastructure and Operations Program under the EPM appropriation.

FY 2023 Change from FY 2022 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$1,412.0) This net program change is an increase to support EPA facilities projects that will ensure EPA has optimal footprint to support the proposed FTE increase in the FY 2023 Budget request, continue ongoing EPA laboratory consolidation projects, and support agencywide climate sustainability and resiliency initiatives. This increase is partially offset by a decrease in rent, utilities, security, and transit subsidy needs.

Statutory Authority:

Federal Property and Administration Services Act; Reorganization Plan No. 3 of 1970, 84 Stat. 2086, as amended by Pub. L. 98-80, 97 Stat. 485 (codified at Title 5, App.) (EPA's organic statute).

Pesticides Licensing

Pesticides: Protect Human Health from Pesticide Risk

Program Area: Pesticides Licensing

Goal: Ensure Safety of Chemicals for People and the Environment

Objective(s): Ensure Chemical and Pesticide Safety

(Dollars in Thousands)

	FY 2021 Final Actuals	FY 2022 Annualized CR	FY 2023 President's Budget	FY 2023 President's Budget v. FY 2022 Annualized CR
Environmental Programs & Management	\$58,124	\$60,181	\$62,726	\$2,545
<i>Science & Technology</i>	<i>\$2,431</i>	<i>\$2,803</i>	<i>\$2,917</i>	<i>\$114</i>
Total Budget Authority	\$60,555	\$62,984	\$65,643	\$2,659
Total Workyears	434.3	385.6	385.6	0.0

Total program work years in FY 2023 include 82.1 FTE funded by the Reregistration and Expedited Processing Revolving Fund.

Program Project Description:

EPA’s Pesticide Program screens new pesticides before they reach the market and ensures that pesticides already in commerce are safe. As directed by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Federal Food, Drug, and Cosmetic Act (FFDCA), as amended by the Food Quality Protection Act of 1996 (FQPA), and the Pesticide Registration Improvement Extension Act of 2018 (PRIA 4),³² EPA is responsible for registering and re-evaluating pesticides to protect consumers, pesticide users, workers who may be exposed to pesticides, children, and other sensitive populations. To make regulatory decisions and establish tolerances (*e.g.*, maximum allowable pesticide residues on food and feed) for food use pesticides and for residential or non-occupational use, EPA must find the pesticide safe. This involves considering cumulative and aggregate risks and ensuring extra protection for children as required by the FQPA. Aggregate assessments ensure that there is reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposure and all other exposure for which there is reliable information. For cumulative assessments, the Agency is required to consider available information concerning the cumulative effects of such residues and other substances that have a common mechanism of toxicity. The Agency must balance the risks and benefits of other uses. For antimicrobial pesticides with public health claims, EPA requires that manufacturers perform tests to ensure the efficacy (*i.e.*, performance) of products per the labelling. In response to the ongoing COVID-19 pandemic and in anticipation of future public health emergencies, the Pesticide Program evaluates public health claims for antimicrobial products, including the accelerated availability of disinfectants determined to be effective against SARS-CoV-2 and development of study designs to support the generation of innovative products, including those that can reduce airborne transmission of the virus.

³² On Friday, March 8, 2019, the Pesticide Registration Improvement Extension Act of 2018 (PRIA 4), which reauthorizes PRIA for 5 years through fiscal year 2023 and updates the fee collection provisions of the FIFRA, was signed into law.

Under the Science and Technology appropriation, this program operates two laboratories, the Microbiology Laboratory³³ and the Analytical Chemistry Laboratory,³⁴ that support the goal of protecting human health and the environment through diverse analytical testing, and analytical method development and validation efforts. These laboratories provide a variety of technical services to EPA, other federal and state agencies, tribal nations, and other organizations to protect human health from pesticide risk.

FY 2023 Activities and Performance Plan:

Work in this program directly supports Goal 7/Objective 7.1, Ensure Chemical and Pesticide Safety in the *FY 2022 – 2026 EPA Strategic Plan*.

The Microbiology Laboratory will continue to protect human health by ensuring the availability of scientifically sound efficacy test methods for antimicrobial pesticides (e.g., hospital disinfectants used to treat surfaces). By developing new methods for new uses and emerging pathogens, the regulated community can register new products as well as new claims for existing products. These efforts will have an impact on the public because of the critical support the Laboratory provides to inform regulatory actions for public health pesticides, identify pathways for approval of pathogen-specific claims, and allow for marketplace penetration of these products.

Specifically, in FY 2023, the Microbiology Laboratory will:

- Complete the data collection, analysis, and development of regulatory guidance materials on a quantitative method that follows the Organization for Economic Cooperation and Development (OECD) quantitative method for bactericidal claims to support adoption of the method for regulatory purposes.
- Complete analysis of FY 2021-2022 multi-laboratory data and develop guidance materials and final method (through American Society for Testing and Materials [ASTM] review) for *Legionella* in recirculating water for cooling tower remediation.
- Issue prototype method and guidance for evaluating porous materials found in clinical and agricultural environments (e.g., room separation curtains, vinyl surfaces, wood, etc.)
- Provide efficacy testing and technical support for workplans for the Antimicrobial Product Evaluation Program (APEP) pursuant to EPA's response to the Office of the Inspector General (Report No. 16-P-0316).³⁵
- Develop residual self-sanitizing disinfectant protocol (SARS-CoV-2) and collect multi-laboratory data to support regulatory use.
- Complete data analysis and development of final ASTM method (ASTM work item WK73519) and regulatory guidance document for evaluating the efficacy of antimicrobial towelettes.
- Continue to develop laboratory capacity for conducting efficacy testing with Biosafety Level 3 (BSL-3) microorganisms at the Environmental Science Center in Ft. Meade, Maryland. SARS-CoV-2 is a BSL-3 microorganism; EPA's Office of Pesticide Programs

³³ For additional information, please visit: <https://www.epa.gov/aboutepa/about-microbiology-laboratory>.

³⁴ For additional information, please visit: <https://www.epa.gov/aboutepa/about-analytical-chemistry-laboratory-acl>.

³⁵ *See*, Report No. 16-P-0316, "Report: EPA Needs a Risk-Based Strategy to Assure Continued Effectiveness of Hospital-Level Disinfectants," found at: <https://www.epa.gov/office-inspector-general/report-epa-needs-risk-based-strategy-assure-continued-effectiveness>.

has the only EPA laboratory with physical containment laboratories to manage BSL-3 microbes.

In FY 2023, the Analytical Chemistry Laboratory will continue to protect human health by ensuring the availability of appropriate analytical methods for analyzing pesticide residues in food and feed and ensuring their suitability for monitoring pesticide residues and enforcing tolerances. In addition, the Laboratory will:

- Develop improved analytical methods using state of the art instruments to replace outdated methods, thus increasing laboratory efficiency and accuracy of the data.
- Provide analytical support to fill in data gaps for the Pesticide Programs' risk assessments and for Section 18 emergency exemptions, and to perform studies for use in risk mitigation.
- Provide analytical assistance and technical advice to all regional offices in support of their enforcement cases, including cases against imported disinfectant products with false claims against SARS-CoV-2. This could disproportionately impact members of communities with environmental justice (EJ) concerns who might not speak English, who may be being targeted by illegal foreign imports, and who may not know to look for approved products (*i.e.*, List N products).
- Verify that pesticides are properly formulated (as requested).
- Operate EPA's National Pesticide Standard Repository.³⁶

Preventing Disease through Public Health Pesticides: Antimicrobial Testing

EPA's Antimicrobial Testing Program (ATP) has been testing hospital sterilants, disinfectants, and tuberculocides since 1991 to help ensure that products in the marketplace meet stringent efficacy standards. EPA is in the process of developing a new risk-based testing strategy in response to OIG recommendations made in FY 2016.³⁷ Consistent with the OIG recommendations, EPA suspended the ATP in November 2017. EPA released a draft risk-based strategy, renamed the Antimicrobial Performance Evaluation Program (APEP), in October 2019 for public comment and will continue to seek public input prior to implementation as early as FY 2023. Implementation of the APEP will benefit public health by ensuring approved antimicrobials meet contemporary efficacy standards.

The Microbiology Laboratory will continue to develop efficacy methods to support EPA's antimicrobial pesticide regulatory programs. The results of these efforts will help ensure products are available to control various bacteria (*e.g.*, *Clostridioides difficile*), viruses (*e.g.*, SARS-CoV-2), and biofilms and to inform EPA's method development activities in FY 2023 and beyond.

Performance Measure Targets:

Work under this program supports performance results in the Pesticides: Protect the Environment from Pesticide Risk Program under the EPM appropriation.

³⁶ For additional information, please visit: <https://www.epa.gov/pesticide-analytical-methods/national-pesticide-standard-repository>.

³⁷ For additional information, please visit: <https://www.epa.gov/pesticide-registration/antimicrobial-performance-evaluation-program-apep>.

FY 2023 Change from FY 2022 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$90.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (-\$90.0) This change to fixed and other costs is a decrease due to the recalculation of laboratory fixed costs.
- (+\$114.0) This program change is an increase in laboratory Operations and Maintenance costs.

Statutory Authority:

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); Federal Food, Drug, and Cosmetic Act (FFDCA), §408.

Pesticides: Protect the Environment from Pesticide Risk

Program Area: Pesticides Licensing

Goal: Ensure Safety of Chemicals for People and the Environment

Objective(s): Ensure Chemical and Pesticide Safety

(Dollars in Thousands)

	FY 2021 Final Actuals	FY 2022 Annualized CR	FY 2023 President's Budget	FY 2023 President's Budget v. FY 2022 Annualized CR
Environmental Programs & Management	\$36,714	\$39,543	\$45,876	\$6,333
<i>Science & Technology</i>	<i>\$1,805</i>	<i>\$2,207</i>	<i>\$2,252</i>	<i>\$45</i>
Total Budget Authority	\$38,519	\$41,750	\$48,128	\$6,378
Total Workyears	322.1	249.6	259.6	10.0

Total program work years in FY 2023 include 53.2 FTE funded by the Reregistration and Expedited Processing Revolving Fund.

Program Project Description:

EPA’s Pesticide Program screens new pesticides before they reach the market and ensures that pesticides already in commerce are safe. As directed by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Federal Food, Drug, and Cosmetic Act (FFDCA), as amended by the Food Quality Protection Act of 1996 (FQPA), and the Pesticide Registration Improvement Extension Act of 2018 (PRIA 4),³⁸ EPA is responsible for registering and re-evaluating pesticides to protect humans and plants, animals, and ecosystems that are not targets of the pesticide. Under FIFRA, the Agency must balance the risks and benefits of other uses. For antimicrobial pesticides with public health claims, EPA requires that manufacturers perform tests to ensure the efficacy (*i.e.*, performance) of products per the labelling.

In addition to FIFRA responsibilities, the Agency has responsibilities under the Endangered Species Act (ESA).³⁹ Under ESA, EPA must ensure that pesticide regulatory decisions will not destroy or adversely modify designated critical habitat or result in jeopardy to the continued existence of species listed by the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS). Where risks are identified, EPA must work with FWS and NMFS in a consultation process to ensure these pesticide registrations also will meet the ESA standard.

Under the Science and Technology appropriation, EPA’s Pesticide Program operates two laboratories, the Microbiology Laboratory⁴⁰ and the Analytical Chemistry Laboratory,⁴¹ that support the goal of protecting human health and the environment through diverse analytical testing, and analytical method development and validation efforts. These laboratories provide a variety of technical services to EPA, other federal and state agencies, tribal nations, and other organizations

³⁸ On Friday, March 8, 2019, the Pesticide Registration Improvement Extension Act of 2018 (PRIA 4), which reauthorizes PRIA for 5 years through fiscal year 2023 and updates the fee collection provisions of the FIFRA was signed into law.

³⁹ *See*, ESA sections 7(a)(1) and 7(a)(2); Federal Agency Actions and Consultations (16 U.S.C. § 1536(a)), available at the U.S. Fish and Wildlife Service ESA internet site: <https://www.fws.gov/service/section-7-consultations>.

⁴⁰ For additional information, please visit: <https://www.epa.gov/aboutepa/about-microbiology-laboratory>.

⁴¹ For additional information, please visit: <https://www.epa.gov/aboutepa/about-analytical-chemistry-laboratory-acl>.

FY 2023 Activities and Performance Plan:

Work in this program directly supports Goal 7/Objective 7.1, Ensure Chemical and Pesticide Safety in the *FY 2022 – 2026 EPA Strategic Plan*.

In FY 2023, EPA will realize the benefits of pesticides by ensuring the continued operation of the National Pesticide Standard Repository. The Microbiology Laboratory and the Analytical Chemistry Laboratory will continue to conduct chemistry and efficacy evaluations for antimicrobials. As the recognized source for expertise in pesticide analytical method development, EPA's Pesticide Program laboratories will continue to provide quality assurance review, technical support, and training to EPA's regional offices, state laboratories, and other federal agencies that implement the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

The Analytical Chemistry Laboratory will continue to maintain the National Pesticide Standard Repository and collect and maintain an inventory of analytical standards of registered pesticides in the U.S. EPA provides these pesticide standards (approximately 4,000 to 5,000 annually) to qualified federal, state, territorial, and tribal laboratories for food and product testing and environmental monitoring. In FY 2018, efficiency reviews showed that the typical turnaround time for a standard request was approximately 15 working days. Using the results of the efficiency review, the Analytical Chemistry Laboratory is implementing procedural changes, such as requiring requests be grouped for pesticide standards, instituting an inventory control system focusing on high demand standards, and installing a chemist as the lead staff person in the Repository to reduce the turnaround time to 12 days.⁴⁵ These initial changes will help federal agencies, states, and tribal laboratories expedite enforcement efforts, and further process enhancements will continue in FY 2023 and beyond. The Analytical Chemistry Laboratory also will continue its work in: developing and validating multiresidue methods using state-of-the-art methodology and instrumentation; providing chemical analysis for assessing risk to human health and to the environment from agricultural use of pesticides; and providing technical support to EPA regional offices to ensure that pesticide products are formulated according to approved labels.

In FY 2023, the Microbiology Laboratory will continue to evaluate FIFRA Section 18 emergency exemptions and novel protocol requests for new uses and novel pathogens. The Laboratory also will continue the development of data and methods to support Section 18 for high consequence animal pathogens (e.g., African swine fever, Newcastle disease virus, etc.). In addition, the continued work to develop new methods for emerging pathogens (e.g., *Legionella*, *Candida auris*, etc.) and clinical porous materials provides a pathway for registrants to add new claims to existing antimicrobial pesticides. In some cases, the methods will lead to the development of new products when currently registered formulations are not effective against emerging pathogens. The Laboratory anticipates supporting up to 25 requests for these activities during FY 2023. The Microbiology Laboratory also will continue to refine and develop methods to support EPA's Section 3 and Section 18 regulatory programs, continuing to develop testing methods for evaluating effectiveness of disinfectant products against airborne SARS-CoV-2 virus. In addition, the Laboratory will collaborate with EPA's Homeland Security Research Program to develop guidance for registrants seeking to make long-term disinfectant efficacy claims and explore novel control and application options for disinfectant products. The Laboratory also will continue to

⁴⁵ For those pesticide standard requests that are not complicated and/or standards that are not expiring.

Research: Air, Climate and Energy

Research: Air, Climate and Energy

Program Area: Research: Air, Climate and Energy
Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2021 Final Actuals	FY 2022 Annualized CR	FY 2023 President's Budget	FY 2023 President's Budget v. FY 2022 Annualized CR
Science & Technology	\$76,733	\$95,250	\$132,924	\$37,674
Total Budget Authority	\$76,733	\$95,250	\$132,924	\$37,674
Total Workyears	265.6	258.0	297.7	39.7

Program Project Description:

Air pollution adversely affects human health and the environment, yet millions of Americans still live in or near geographic areas that do not meet national standards for air pollutants. Climate change is impacting public health, air, and water quality today and will exacerbate other environmental challenges in the future. Many air pollution sources are located communities with environmental justice concerns that also are more vulnerable to the impacts of climate change. To address these and other air pollution issues, EPA’s Air, Climate, and Energy (ACE) Research Program provides scientific information to EPA program and regional offices, tribes, states, and other partners. ACE advances the science needed to achieve clean air, attain the National Ambient Air Quality Standards (NAAQS),⁴⁶ reduce emissions of hazardous air pollutants (HAPs), address the causes and consequences of climate change and environmental inequities, and develop more resilient communities to protect human health and ecosystems. ACE also contributes to understanding the impacts of interventions that reduce exposures and protect public health; strategies to prepare, adapt, and build resilience; and responses to the transformation of our energy systems.

The ACE Research Program is centered around two inter-related research topic areas: 1) understanding air pollution and climate change and their impacts on human health and ecosystems; and 2) responding to risks and impacts and preparing for the future. The ACE Research Program relies on successful partnerships, including with academic and industry researchers, tribes, states, local and private sector organizations, as well as key federal agencies.

Recent Accomplishments of the ACE Research Program include:⁴⁷

- **Informing Ozone Attainment Strategies:** In FY 2021, EPA researchers produced scientific data from measurements and modeling of ozone formation and transport in two

⁴⁶ Section 109 of the Clean Air Act identifies two types of national ambient air quality standards – primary standards provide public health protection, including protecting the health of “sensitive” populations such as children, older adults, and persons with pre-existing disease such as asthma or cardiovascular disease and secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, wildlife, soils, water, crops, vegetation, and buildings. Unless otherwise stated, in this document the term NAAQS will refer to both primary and secondary standards.

⁴⁷ For more information, please see <https://www.epa.gov/research/national-research-programs>.

difficult non-attainment areas, Connecticut and Denver.⁴⁸ The research demonstrated how the combination of local emissions controls and a better understanding of ozone transport from outside a non-attainment area are needed to effectively reduce ozone concentrations within a non-attainment area. EPA researchers also used a detailed hemispheric air quality model to improve estimates of the contributions of long-range transport of ozone from outside North America to ozone concentrations in the U.S., demonstrating an increase in this contribution over the period from 1990-2010.

- **Climate Change Impacts and Adaptation Planning Tools:** Climate change continues to impact U.S. communities through extreme heat and precipitation, flooding, and drought. With heat waves and droughts increasing the size and severity of wildfires, EPA researchers improved emissions factors for different types of fire conditions, including those occurring during prescribed fires.⁴⁹ EPA researchers collaborated with scientists from the U.S. Forest Service and the Department of Interior to publish the *Comparative Assessment of the Impacts of Prescribed Fire Versus Wildfire*, which used integrated modeling of smoke emissions, air quality, and health impacts to demonstrate that in two case studies, well-designed prescribed fires can potentially reduce the overall size of a subsequent wildfire and reduce smoke emissions and public health impacts.⁵⁰ In FY 2021, EPA researchers also published a methodology for quantifying potential changes in future extreme precipitation from climate projections and applied it to estimate significant increases in the highest rainfall frequencies, up to 168 percent for 1,000-year rainfall events, and widespread regional increases in total rainfall up to 44 percent from a single tropical storm.⁵¹
- **PFAS:** States and communities continue to be concerned with the production and disposal of materials containing perfluoroalkyl and polyfluoroalkyl substances (PFAS) and the associated air emissions of PFAS. EPA is committed to conducting research to better understand PFAS exposure pathways and understand the effects of PFAS treatment and destruction technologies, including air emissions from incomplete combustion of PFAS during incineration as a means of destroying PFAS waste.⁵² In FY 2021, EPA researchers published a review of air sources and pathways for PFAS exposures⁵³ and produced a draft method (Other Test Method 45) that is suitable for 50 targeted PFAS compounds.⁵⁴ This method provided guidance to states and communities for establishing in-stack emissions method detection limits and quantitative reporting limits and can be expanded to new target PFAS compounds as new standards become available.

⁴⁸ For more information, please see:

https://www.cmascenter.org/conference/2020/slides/Matichuketal_19thAnnual_CMAS_Presentation_Oct28th_2pmSession.pdf

⁴⁹ For more information, please see: <https://www.sciencedirect.com/science/article/pii/S135223102100011X?via%3Dihub>

⁵⁰ For more information, please see: https://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=543347

⁵¹ For more information, please see: <https://www.nature.com/articles/s41612-021-00176-9>

⁵² For more information, please see: https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf

⁵³ For more information, please see: <https://intranet.ord.epa.gov/sites/default/files/2021-08/JEH1-2.21-Special-Report-Review-Source-Transportation-Pathways.pdf>

⁵⁴ For more information, please see: https://www.epa.gov/sites/default/files/2021-01/documents/otm_45_semivolatle_pfas_1-13-21.pdf

FY 2023 Activities and Performance Plan:

Work in this Program provides Cross-Agency Mission and Science Support and is allocated across strategic goals and objectives in the *FY 2022-2026 EPA Strategic Plan*.

The ACE Research Program prioritizes key activities to support attainment of the NAAQS and implementation of stationary and mobile source regulations, as well as foundational science to inform decision making with consideration of increasing climate change impacts. The ACE Research Program includes work to develop, evaluate, and apply measurement methods and models incorporating the latest physical science and understanding of behaviors that impact the system. The research performed addresses program and regional science information needs across multiple disciplines. The research conducted also advances EPA's capabilities to understand sources of air pollution, the fate and transport of air contaminants, and their effects in the midst of changing energy infrastructure and climate. The planned research responds to identified needs in areas of emerging concern to the Administration, EPA, tribes, and state policymakers, including climate change, environmental justice and equity, PFAS, ethylene oxide, and wildland fires.

In FY 2023, the ACE Research Program will continue to:

- Assess human and ecosystem exposures and effects associated with air pollutants on individual, community, regional, national, and global scales, both today and in the future, under a changing climate.⁵⁵
- Assess the consequences of climate change and the vulnerability of communities and ecosystems to climate change impacts, including wildfires and other extreme events, and identify and evaluate strategies to adapt to and build resilience to these impacts.
- Characterize disproportionate impacts of climate change and air pollution on communities with environmental justice concerns and identify and evaluate strategies to reduce impacts in those communities.
- Develop and evaluate innovative multi-pollutant and sector-based approaches to preventing pollution, particularly in environmental justice communities.
- Characterize the positive and negative environmental effects of energy efficiency and renewable energy and evaluate strategies to expand the benefits of transformations in transportation and energy systems, especially for communities with environmental justice concerns.
- Provide human exposure and environmental modeling, monitoring, metrics, and information needed to inform air quality and climate change decision making at the federal, tribal, state, and local level.

⁵⁵ Beyond effects associated with ambient air exposures, consideration of potential human and ecosystem exposures and effects associated with deposition of air pollutants to water and land also are evaluated.

- Deliver state-of-the-art tools that tribes and states can use to identify effective emission reduction strategies to meet the NAAQS and enhance air quality measurement and modeling methods to ascertain current and future compliance with the NAAQS, including potential impacts from the changing climate.
- Develop and apply approaches to evaluate the positive and negative environmental impacts of the transition to a low-carbon energy system, including development of a report to Congress on the environmental and resource conservation impacts of the Renewable Fuel Standard.⁵⁶

In FY 2023, EPA will invest additional funds to expand the Administration’s science-based approach to improving wildfire readiness by enhancing wildfire data and communications related to air quality and helping communities become “smoke ready”. Smoke ready communities benefit community health by coordinating community-level action related to monitoring outdoor air quality, creating clean indoor air, and communicating actionable public health messaging. Smoke ready communities have evidence-based strategies in place to guide responses to wildfire smoke events, which include actions that people can take to reduce exposures to harmful smoke, preventing health impacts such as asthma attacks, emergency room visits, heart attacks, and premature death.

EPA also will invest additional funds to increase PFAS research efforts with specific emphasis on implementing the *PFAS Strategic Roadmap*.⁵⁷

Research Planning:

EPA research is built around six integrated and transdisciplinary research programs. Each of the six programs is guided by a Strategic Research Action Plan (StRAP) that is developed with and reflects the research needs of Agency programs and regional offices, states, and tribes. Each research program is in the process of developing the fourth generation of the StRAPs, which will continue the practice of conducting innovative scientific research aimed at solving the problems encountered by the Agency and its partners.

The Office of Research and Development (ORD) works with various groups, including communities, to ensure the integrity and value of its research through a variety of mechanisms that include:

- EPA’s Board of Scientific Counselors (BOSC)
 - ORD meets regularly with this committee, which provides advice and recommendations to ORD on technical and management issues of its research programs.

⁵⁶ Required by the Energy Independence and Security Act of 2007, PL110-140. For more information, please see: <https://www.epa.gov/laws-regulations/summary-energy-independence-and-security-act>. More information about the report is available at: https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=IO&dirEntryId=341491.

⁵⁷ See EPA’s PFAS Strategic Roadmap at: https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf

- State Engagement
 - EPA’s state engagement⁵⁸ is designed to inform states about their role within EPA and EPA’s research programs and to better understand the science needs of state environmental and health agencies.
- Tribal Partnerships
 - Key tribal partnerships are established through the Tribal Science Program, which provides a forum for the interaction between tribal and Agency representatives. These interactions identify research of mutual benefit and lead to collaborations on important tribal environmental science issues.

Performance Measure Targets:

(PM RD2) Number of ORD activities related to environmental justice that involve or are designed to be applicable to tribes, states, territories, local governments, and communities.	FY 2022 Target	FY 2023 Target
	No Target Established	TBD
(PM RD3) Percentage of ORD climate-related research products meeting partner needs.	FY 2022 Target	FY 2023 Target
	93	94
(PM RD4) Percentage of ORD environmental justice-related research products meeting partner needs.	FY 2022 Target	FY 2023 Target
	93	94

FY 2023 Change from FY 2022 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$2,346.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (+\$37.0) This change to fixed and other costs is an increase due to the recalculation of laboratory fixed costs.
- (-\$30,030.0) This program change is a decrease due to the reduction in resources towards the Air, Climate, and Energy Research Program’s collaborative research on climate adaptation and resilience with the new Advanced Research Projects Agency for Climate (ARPA-C) that will be located within DOE. The ARPA model of high-risk, accelerated research is uniquely meant to conduct R&D that, if successful, results in transformational technology advancements.
- (+\$60,446.0 / +30.0 FTE) This net program change increases resources and FTE for the Air, Climate, and Energy Research Program. This increase is targeted to EPA’s commitment to enhance its efforts to combat climate change. This increase will more than double its research to assess the impacts of climate change on human health and ecosystems. This investment includes \$5.411 million in payroll.

⁵⁸ For more information, please see: <https://www.epa.gov/research/epa-research-solutions-states>.

- (+\$4,625.0 / +9.7 FTE) This program change increases resources and FTE for wildfires research. This increase is targeted to improve wildfire readiness by enhancing wildfire data and communications related to air quality and helping communities become “smoke ready.” This investment also includes \$1.75 million in payroll.
- (+\$250.0) This program change increases funding for EPA’s PFAS research efforts, with specific emphasis on implementing the *PFAS Strategic Roadmap*.

Statutory Authority:

Clean Air Act; Title II of Energy Independence and Security Act of 2007; Environmental Research, Development, and Demonstration Authorization Act (ERDDAA); National Environmental Policy Act (NEPA) § 102; Pollution Prevention Act (PPA); Global Change Research Act of 1990.

Research: Chemical Safety and Sustainability

Research: Chemical Safety for Sustainability

Program Area: Research: Chemical Safety for Sustainability
Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2021 Final Actuals	FY 2022 Annualized CR	FY 2023 President's Budget	FY 2023 President's Budget v. FY 2022 Annualized CR
Environmental Programs & Management	\$115	\$0	\$0	\$0
<i>Science & Technology</i>	<i>\$75,966</i>	<i>\$89,518</i>	<i>\$98,093</i>	<i>\$8,575</i>
Hazardous Substance Superfund	\$6,065	\$0	\$8,060	\$8,060
Total Budget Authority	\$82,146	\$89,518	\$106,153	\$16,635
Total Workyears	278.1	273.9	300.9	27.0

Program Project Description:

EPA’s Chemical Safety for Sustainability (CSS) Research Program provides scientific and technical approaches, information, tools, and methods to support the Agency and others to make better-informed, more-timely decisions about chemicals and their potential risks to human health and the environment.⁵⁹ CSS products strengthen the Agency’s ability to use the best available science to evaluate and predict human health and ecological impacts from the use, reuse, recycling, and disposal of manufactured and naturally occurring chemicals and their by-products.

CSS research informs Agency decisions about chemicals, accelerates the pace of chemical assessment and decision-making, and helps to replace, reduce, and refine the use of mammals to evaluate chemical risks to ecological systems and human health. CSS products inform Agency programs established to implement environmental regulations that govern agency actions to evaluate existing and new chemicals (Toxic Substances Control Act [TSCA]); develop and use alternative testing protocols (TSCA, Federal Insecticide Fungicide and Rodenticide Act [FIFRA]); protect the Nation’s food supply (Food Quality Protection Act [FQPA]), address product safety (Federal Food Drug Cosmetics Act [FFDCA]), support chemical prioritization (TSCA, Safe Drinking Water Act [SDWA]), support the development of safer and more sustainable chemicals and alternatives (Pollution Prevention [P2] Act [PPA]), evaluate pesticide registrations (FIFRA, Endangered Species Act), and mitigate active (Resource Conservation and Recovery Act [RCRA]) and inactive (Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA]) Superfund remediation sites.

CSS research activities are coordinated with the activities of other national research programs and the results produced inform other high priority research topics. For example, planned research will address per- and polyfluoroalkyl substances (PFAS), climate change, and risks in communities with environmental justice (EJ) concerns. Coordination with the Health and Environmental Risk Assessment (HERA) Research Program ensures that the approaches, tools, and information

⁵⁹ For the current CSS StRAP, please see: <https://www.epa.gov/research/chemical-safety-sustainability-strategic-research-action-plan-2019-2022>.

produced by CSS can be used to improve chemical risk assessments, reduce uncertainties associated with those assessments, and increase the speed of delivering chemical information to the Agency.

The CSS Research Program is organized into eight, integrated research areas that include research on toxicity, exposure, human health, ecological health, chemical modeling and prediction, and chemical integration and informatics. These research areas fulfill requirements for chemical evaluation under TSCA as amended by the Frank R. Lautenberg Chemical Safety for the 21st Century Act and as part of SDWA; pesticide evaluation under FIFRA; chemical testing for endocrine system impacts under FQPA; Agency implementation of TSCA Section 5 (New Chemicals) and Section 6 (Existing Chemicals); the development of safer and more sustainable chemicals and alternatives under PPA and TSCA, and identification of contaminants of emerging concern. The CSS Research Program provides ongoing support to the Agency's Chemical Safety and Pollution Prevention Program for the successful implementation of these TSCA activities, as well as their evaluation of pesticides under FIFRA.⁶⁰

Recent Accomplishments of the CSS Research Program include:

- **Development and Advancement of New Approach Methods (NAMs):** CSS objectives and research activities are strongly supporting the development of NAMs that will improve the Agency's understanding of chemical toxicity. NAMs are focused on using faster, less expensive approaches that reduce the use of mammals for toxicity testing. CSS continues to collaborate closely with the Chemical Safety and Pollution Prevention Program to implement the June 2018 TSCA Strategic Plan⁶¹ that emphasizes the development and implementation of alternative test methods. Additionally, CSS research is a key component of the December 2021 NAMs workplan.⁶² Critical to this effort is implementation of a tiered hazard evaluation strategy. CSS investigators are currently advancing methods in high-throughput phenotypic profiling (HTPP) and high-throughput transcriptomics (HTTr). These approaches can be applied to prioritize and group chemicals. Additionally, investigators are exploring approaches and models for species extrapolation in the ecotoxicology domain, and development of high-throughput exposure and toxicokinetic models. In May of 2021, in an EPA report,⁶³ CSS research enabled development of a method, to integrate publicly available hazard, exposure, persistence, and bioaccumulation information for more than 33,000 chemical substances, including both traditional and NAM data. The method allows for discriminating between chemicals that have the potential to present hazard or exposure concerns and those that do not.
- **Continued Release, Evolution, and Updating of Multiple Digital Information Products to Inform Decision Making:** The *CompTox Chemicals Dashboard*⁶⁴ is the Agency's 'first-stop-shop' for information on chemical properties, characteristics, structure, toxicity, exposure, and persistence. The *Dashboard* is used by the Agency and

⁶⁰ For more information, please see: <https://www.epa.gov/chemical-research>.

⁶¹ For more information, please see: https://www.epa.gov/sites/production/files/2018-06/documents/epa_alt_strat_plan_6-20-18_clean_final.pdf.

⁶² For more information, please see: <https://www.epa.gov/chemical-research/new-approach-methods-work-plan>.

⁶³ For more information, please see: https://cfpub.epa.gov/si/si_public_pra_view.cfm?dirEntryID=349776&Lab=CCTE

⁶⁴ For more information, please see: <https://comptox.epa.gov/dashboard>.

its external partners to generate real-time quantitative structure-activity relationship (QSAR) predictions for chemical property and toxicity endpoints. It allows for flexible searches including chemical and functional use and has batch search functionality. As of the June 2021 release, the *Dashboard* contains curated data on 900,000 chemicals. The *ECOTOX Knowledgebase*⁶⁵ serves as the comprehensive, publicly available source of environmental toxicity data on aquatic life, terrestrial plants, and wildlife. The March 2021 release of the ECOTOX Knowledgebase contains over 1 million records and provides information on over 12,000 chemicals and over 13,000 species from over 50,000 references. The *Chemical Transformation Simulator* continues to develop as a web-based tool for predicting environmental and biological transformation pathways for organic chemicals. Recently, the *Simulator* was expanded to include environmental transformation information for PFAS chemicals. *SeqAPASS*⁶⁶ – Sequence Alignment to Predict Across Species Susceptibility – is a tool enabling extrapolation of toxicity information across species. Version 5.0, released in December 2020, features improved functionalities and visualization of results. Research and development for all these systems continues in order to meet the information needs of decision makers.

FY 2023 Activities and Performance Plan:

Work in this Program provides Cross-Agency Mission and Science Support and is allocated across strategic goals and objectives in the *FY 2022-2026 EPA Strategic Plan*.

The objective of CSS research activities is to inform risk-based decisions made by EPA programs, states, tribes, and others. Of particular importance are ‘chemicals of immediate and emerging concern,’ such as PFAS, which heighten the need for rapid scientific approaches to evaluate potential chemical safety. In FY 2023, CSS will invest additional funds in PFAS research efforts, with specific emphasis on implementing the *PFAS Strategic Roadmap*.⁶⁷ CSS also will increase its efforts to conduct research and reviews on scientifically sound EPA-initiated existing chemical risk evaluations in support of TSCA.

In FY 2023, research efforts also will focus on replacing, reducing, and refining the use of mammals in testing, while accelerating the pace of chemical assessment and decision-making. CSS research products will continue to use innovative *in vitro* and *in silico* (computer modeling) approaches to provide more timely and comprehensive information about chemical hazard and exposure while still providing information of equal or greater biological predictivity than current *in vivo* animal models.

Selected research areas are highlighted below for work in FY 2023.

- **High-Throughput Toxicity (HTT) Testing:** This research is focused on developing, testing, and applying NAMs to evaluate chemical hazards, with an emphasis on developmental neurotoxicology, inhalation toxicology, thyroid disruption, and

⁶⁵ For more information, please see: <https://cfpub.epa.gov/ecotox/>.

⁶⁶ For more information, please see: <https://www.epa.gov/chemical-research/sequence-alignment-predict-across-species-susceptibility>.

⁶⁷ See EPA’s PFAS Strategic Roadmap at: https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf

methodologically challenging chemicals. These will enable EPA to make better, more timely decisions about chemicals by increasing toxicological information for more chemicals.

- **Rapid Exposure and Dosimetry (RED) and Ecotoxicological Assessment and Modeling (ETAM):** This research parallels work in the HTT research area to provide information to inform Agency chemical risk assessment activities. Chemical exposure research also includes the continued development of advanced analytical and computational tools, such as non-targeted analysis, to detect and identify unknown chemicals in complex environmental media, biological media, and consumer products. Non-targeted analysis has been critical for the identification of previously unknown PFAS chemicals in the environment. Ecotoxicological Assessment and Modeling efforts support the Agency's work considering the impacts to pollinators. Specifically, research includes assessing the impacts of pesticides on honeybees and pollen bees to support pesticide assessments.
- **PFAS Research:**⁶⁸ PFAS are a class of substances of concern and EPA is committed to helping states, tribes, and local communities understand and manage risks associated with these chemicals.⁶⁹ For most of the over 6,000 PFAS chemicals, there are little or no published toxicity data available. CSS is addressing this gap by conducting high-throughput toxicological screening assays on hundreds of PFAS chemicals. In FY 2023, CSS will build upon the research foundation formed from completed work outlined in the *PFAS Strategic Roadmap*.⁷⁰ For more information on CSS' PFAS work, please see the CSS narrative for the Superfund appropriation.
- **Improved Understanding of Biological Impacts:** This research helps decision-makers understand the significance of chemical impacts on biological systems. This is especially important to understanding chemical impacts on developmental and reproductive biology. This program will employ data generated from its chemical evaluation research to develop interpretive frameworks and models to place complex information into biological, chemical, and toxicological context. Data developed in the HTT and Virtual Tissue Modeling research areas will contribute to the study of adverse outcome pathways (AOPs), which link molecular initiating events at the cellular level to apical outcomes expressed at the whole animal level.
- **Delivery of Chemical Information:** The Chemical Safety Analytics research area will continue to provide computational, predictive tools to estimate physicochemical, toxicological, and exposure information for data poor chemicals. CSS is working with the Agency to build program-specific applications, such as RapidTox that facilitate access and use of relevant information to support different decision contexts. These applications will give risk assessors and decision-makers confidence that the new approaches, data, and tools

⁶⁸ For more information, please see: https://www.epa.gov/sites/production/files/2019-02/documents/pfas_action_plan_021319_508compliant_1.pdf.

⁶⁹ For more information, please see: <https://www.epa.gov/pfas/pfas-community-engagement>.

⁷⁰ For more information, please see: <https://www.epa.gov/pfas/pfas-strategic-roadmap-epas-commitments-action-2021-2024>

developed in CSS are both scientifically robust and relevant to environmental decision making.

Research Planning:

EPA research is built around six integrated and transdisciplinary research programs. Each of the six programs is guided by a Strategic Research Action Plan (StRAP) that reflects the research needs of Agency program and regional offices, states, and tribes, and is planned with their active involvement. Each research program is in the process of developing the fourth generation of the StRAPs, which will continue the practice of conducting innovative scientific research aimed at comprehensively assessing and solving the problems encountered by the Agency and its stakeholders.

EPA works with various groups, including communities, to ensure the integrity and value of its research and research planning efforts through a variety of mechanisms that include:

- EPA’s Board of Scientific Counselors (BOSC)
 - The Office of Research and Development (ORD) meets regularly with this committee, which provides advice and recommendations to ORD on technical and management issues of its research programs.
- State Engagement
 - EPA’s state engagement⁷¹ is designed to inform states about their role within EPA and EPA’s research programs, and to better understand the science needs of state environmental and health agencies.
- Tribal Partnerships
 - Key tribal partnerships are established through the Tribal Science Program which provides a forum for the interaction between tribal and Agency representatives. These interactions identify research of mutual benefit and lead to collaborations on important tribal environmental science issues.

Performance Measure Targets:

(PM RD1) Percentage of ORD research products meeting partner needs.	FY 2022 Target	FY 2023 Target
	93	94
(PM RD5) Number of actions implemented for EPA scientific integrity objectives.	FY 2022 Target	FY 2023 Target
	No Target Established	21

⁷¹ For more information, please see: <https://www.epa.gov/research/epa-research-solutions-states>.

FY 2023 Change from FY 2022 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$2,270.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (+\$22.0) This change to fixed and other costs is an increase due to the recalculation of laboratory fixed costs.
- (+\$3,772.0 / +22.0 FTE) This net program change increases funding and FTE for the Chemical Safety for Sustainability Research Program. These FTE will assist in providing scientific and technical approaches, information tools, and methods to better inform decision-making. This investment includes \$3.961 million in payroll and also reflects a slight adjustment in non-payroll resources.
- (+\$500.0) This program change increases funding for EPA's PFAS research efforts, with specific emphasis on implementing the *PFAS Strategic Roadmap*.
- (+\$2,011.0 / +5.0 FTE) This program change increases resources and FTE for EPA's efforts to conduct research and reviews on existing EPA-initiated chemical risk evaluations in support of TSCA. This investment includes \$901.0 thousand in payroll.

Statutory Authority:

Clean Air Act §§ 103, 104; Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Children's Health Act; 21st Century Nanotechnology Research and Development Act; Clean Water Act; Federal Food, Drug, and Cosmetic Act (FFDCA); Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Pollution Prevention Act (PPA); Resource Conservation and Recovery Act (RCRA); Safe Drinking Water Act (SDWA); Toxic Substances Control Act (TSCA).

Health and Environmental Risk Assessment

Program Area: Research: Chemical Safety for Sustainability
Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2021 Final Actuals	FY 2022 Annualized CR	FY 2023 President's Budget	FY 2023 President's Budget v. FY 2022 Annualized CR
Science & Technology	\$35,251	\$37,482	\$42,355	\$4,873
Hazardous Substance Superfund	\$3,654	\$12,824	\$4,896	-\$7,928
Total Budget Authority	\$38,905	\$50,306	\$47,251	-\$3,055
Total Workyears	163.3	154.9	174.9	20.0

Program Project Description:

EPA’s Health and Environmental Risk Assessment (HERA) Program is focused on the science of assessments that inform decisions made by EPA and others, including states and tribes. These assessments provide the scientific basis for decisions under an array of environmental laws, including the: Clean Air Act (CAA), Clean Water Act (CWA), Safe Drinking Water Act (SDWA), Toxic Substances Control Act (TSCA), and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The HERA Program is multidisciplinary and aimed at incorporating scientific innovations to advance analytic approaches and applications needed to address the wide-ranging risk assessment requirements to support implementation of these various statutes.

The current portfolio of HERA products encompasses these two topic areas:

- Science Assessments and Translation:** HERA produces a portfolio of assessment products that optimizes the application of the best available science and technology and is responsive to Agency priorities and timelines. The portfolio includes assessments from among the traditional product lines – Integrated Risk Information System (IRIS), Integrated Science Assessment (ISAs), and Provisional Peer-Reviewed Toxicity Values (PPRTVs) – in addition to a wide range of innovative ‘fit-for-purpose’ products. Additionally, significant emphasis is placed on providing scientific and technical support throughout the lifecycle of decisions, from development to application of the assessment products.
- Advancing the Science and Practice of Risk Assessment:** Research under this topic is targeted to enhance hazard characterization, expand the repertoire of dose-response methods and models, and characterize the utility of emerging data and new computational tools as applied to risk assessment. It also enhances and maintains critical assessment infrastructure, including databases, models, and software support, to ensure transparency and facilitate understanding and translation to Agency partners, external partners, and other users. Refinements to current approaches are expected to improve the accuracy, efficiency, flexibility, and utility of applications across a large landscape of assessment activities.

Recent Accomplishments of the HERA Program include:

The HERA Research Program has been developing assessment products to inform science-based decision making, enhance timely responses, improve screening capabilities, and augment toxicity value derivations for use in risk assessments.

- **Portfolio of Assessment Products:** In October 2020, the *ISA for Oxides of Nitrogen, Oxides of Sulfur, and Particulate Matter - Ecological Criteria* was released⁷² following a peer review by the Clean Air Scientific Advisory Committee. HERA will provide the scientific foundation for the reconsiderations of the particulate matter and ozone National Ambient Air Quality Standards; a *Supplement to the 2019 ISA for Particulate Matter*⁷³ will be finalized in spring 2022. HERA continues to deliver on EPA's commitment to address Per- and polyfluoroalkyl substances (PFAS) in the environment and released the final *Human Health Toxicity Values for Perfluorobutane Sulfonic Acid (CASRN 375-73-5) and Related Compound Potassium Perfluorobutane Sulfonate (CASRN 29420-49-3)*⁷⁴ in April 2021, the draft *IRIS Assessment for Perfluorobutanoic Acid and Related Salts*⁷⁵ in August 2021, and the draft *IRIS Assessment for Perfluorohexanoic Acid and Related Salts*⁷⁶ in April 2022. In FY 2021, nine PPRTV assessments were finalized, and HERA anticipates delivering at least nine additional high-priority PPRTV assessments in FY 2022 to support Superfund priorities.⁷⁷ In FY 2021, HERA also posted final IRIS assessments for ethyl tertiary butyl ether and tert-butyl alcohol, as well as publicly released assessment materials for inorganic mercury salts, vanadium and compounds (oral exposure), and vanadium and compounds (inhalation exposure).⁷⁸ In FY 2022, HERA anticipates publicly releasing a final IRIS assessment for Perfluorobutanoic acid and Related Salts.⁷⁹ HERA also anticipates publicly releasing assessment materials for ethylbenzene, uranium, vanadium and compounds (inhalation exposure), and naphthalene, and draft assessments for chloroform (inhalation), hexavalent chromium, and formaldehyde. HERA also will finalize the Office of Research and Development (ORD) Staff Handbook for Developing IRIS Assessments in FY 2022.
- **Innovations in Risk Assessment:** HERA continues to advance assessment science and modernize its assessment infrastructure through tool and model advancements. In FY 2021, HERA released updates to the Integrated Exposure Uptake Biokinetic (IEUBK) model to support lead biokinetic modeling in children. HERA anticipates finalizing 1) updates to the All-Ages Lead Model (AALM) in the fall of 2022 which will include improved lead biokinetic modeling in adults and children; and 2) EPA's version of the multi-path particle dosimetry (MPPD) model and software for improved mechanistic modeling of inhalation dosimetry for particles in the spring of 2022. Continued advancements are being made to HERA's dose-response analysis tool, Benchmark Dose

⁷² For more information, please see: <https://www.epa.gov/isa/integrated-science-assessment-isa-oxides-nitrogen-oxides-sulfur-and-particulate-matter>.

⁷³ For more information, please see: <https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=352823>.

⁷⁴ For more information, please see: <https://www.epa.gov/pfas/learn-about-human-health-toxicity-assessment-pfas>.

⁷⁵ For more information, please see: https://cfpub.epa.gov/ncea/iris_drafts/recordisplay.cfm?deid=350051.

⁷⁶ For more information, please see: https://cfpub.epa.gov/ncea/iris_drafts/recordisplay.cfm?deid=352767.

⁷⁷ For more information, please see: <https://www.epa.gov/pprtv>.

⁷⁸ For more information, please see: <https://www.epa.gov/iris/iris-recent-additions>.

⁷⁹ For more information, please see: <https://www.epa.gov/iris/iris-recent-additions>.

Software (BMDS),⁸⁰ as well as critical information management databases including HERA's *Health and Environmental Research Online*⁸¹ and the *Health Assessment and Workplace Collaborative*,⁸² contributing to the improvement in the science, structure, and interoperability of these critical assessment infrastructure tools. Accompanying innovations in assessment science in FY2021 and FY2022, HERA has emphasized and coordinated training in risk assessment practice, methods, and tools for EPA staff and stakeholders to enhance communication, understanding, and engagement.

FY 2023 Activities and Performance Plan:

Work in this Program provides Cross-Agency Mission and Science Support and is allocated across strategic goals and objectives in the *FY 2022-2026 EPA Strategic Plan*.

In FY 2023, the HERA Program's work will focus on efforts integral to achieving EPA priorities and informing the Agency's implementation of key environmental decisions. Specifically, the program will:

- Continue developing additional assessments through IRIS of perfluorinated compounds, as well as other priority chemicals identified by EPA's Water Program, Air and Radiation Program, and Land and Emergency Management Program. These HERA assessments include ethylbenzene, hexavalent chromium, chloroform, methylmercury, mercury salts, inorganic arsenic, and formaldehyde.
- Provide assessment, methodology, and modeling support to the Chemical Safety and Pollution Prevention Program on TSCA implementation for an array of chemicals, as well as support to the Air and Radiation Program, including the development of the ISA for Lead to support review of the National Ambient Air Quality Standards (NAAQS).
- Provide high-priority PPRTV human health assessments to support the Land and Emergency Management Program on CERCLA and Resource Conservation and Recovery Act (RCRA) implementation
- HERA will focus on support for specific decision contexts through a modernized assessment infrastructure, applying state of the science tools, databases, and models in assessment development and program management. Continue to develop and apply evidence mapping to provide a better understanding of the extent and nature of evidence available to address priority needs of the Agency and its partners.
- Provide the resources and workflow to two of the five Research and Development Program's Superfund technical support centers (TSCs)⁸³ to provide localized and tailored technical assistance and scientific expertise on human and ecological risk assessments to

⁸⁰ For more information, please see: <https://www.epa.gov/bmlds>.

⁸¹ For more information, please see: <https://hero.epa.gov/hero/>.

⁸² For more information, please see: <https://hawcprd.epa.gov/>.

⁸³ HERA supports the Superfund Health Risk Technical Support Center (STSC) and the Ecological Risk Assessment Support Center (ERASC). For more information on EPA's five TSCs, please see: <https://www.epa.gov/land-research/epas-technical-support-centers>.

states, tribes, and EPA's program and regional offices. This includes direct support in cases of emergencies and other rapid response situations.

- Apply new and alternative approaches, methods, and data to risk assessment products, and technical support to better respond to the needs of the states, tribes, and EPA's program and regional offices, in cooperation with the Chemical Safety for Sustainability (CSS) Research Program.
- Provide training to staff, partners, and stakeholders on risk assessment practice, assessment tool literacy, and standard operating procedures for assessment development via easy-to-access modules.

In addition to the activities listed above, EPA also conducts research across programs in the following areas:

- **PFAS Research:** Per- and polyfluoroalkyl substances (PFAS) are a class of chemicals of concern in the environment, and EPA is committed to pursuing all options to address PFAS pollution and protect human health and the environment. There are still large numbers of PFAS of high interest to stakeholders which currently have no federal published, peer-reviewed toxicity values. As described in the *PFAS Strategic Roadmap*,⁸⁴ within the HERA Research Program, EPA is prioritizing additional PFAS for development of peer-reviewed toxicity values. This will result in an expanded set of high-quality peer-reviewed toxicity values for use by federal, state, and tribal decision makers in making risk assessment and management decisions. In addition, EPA is identifying, reviewing, organizing, and presenting relevant health information on PFAS through systematic evidence mapping to identify data gaps, inform prioritization and hazard characterization, and facilitate human health assessments for PFAS.
- **Lead:** Childhood lead exposure continues to be one of the highest priorities for EPA. To advance the application of lead exposure and biokinetic models in EPA regulatory decisions and site assessments, HERA research will enhance, evaluate, and apply lead biokinetic models used to estimate potential blood lead levels for regulatory determinations.⁸⁵ Additionally, the Exposure Factors Handbook⁸⁶ provides up-to-date data on various human factors, including soil and dust ingestion rates, used by risk assessors.

Research Planning:

EPA is built around six integrated and transdisciplinary research programs. Each of the six programs is guided by a Strategic Research Action Plan (StRAP) that reflects the research needs of Agency program and regional offices, states, and tribes, and is planned with their active involvement. Each research program is in the process of developing the fourth generation of the

⁸⁴ For more information, please see EPA's PFAS Strategic Roadmap at: https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf

⁸⁵ For more information, please see: <https://www.epa.gov/superfund/lead-superfund-sites-software-and-users-manuals>.

⁸⁶ For more information, please see: <https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=236252>.

StRAPs, which will continue the practice of conducting innovative scientific research aimed at solving the problems encountered by the Agency and its stakeholders.

ORD works with various groups, including communities, to ensure the integrity and value of its research through a variety of mechanisms that include:

- EPA’s Board of Scientific Counselors (BOSC)
 - ORD meets regularly with this committee, which provides advice and recommendations to ORD on technical and management issues of its research programs.
- State Engagement
 - EPA’s state engagement⁸⁷ is designed to inform states about their role within EPA and EPA’s research programs, and to better understand the science needs of state environmental and health agencies.
- Tribal Partnerships
 - Key tribal partnerships are established through the Tribal Science Program which provides a forum for the interaction between tribal and Agency representatives. These interactions identify research of mutual benefit and lead to collaborations on important tribal environmental science issues.

Performance Measure Targets:

Work under this program supports performance results in the Research: Chemical Safety for Sustainability Program under the S&T appropriation.

FY 2023 Change from FY 2022 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$1,233.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (+\$3,640.0 / +20.0 FTE) This program change increases funding and FTE for the Health and Environmental Risk Assessment program. These FTE will assist in advancing science assessments, such as IRIS, as well as analytical approaches for the application of risk assessments. This investment includes \$3.618 million in payroll.

Statutory Authority:

Clean Air Act §§ 103, 108, 109, and 112; Clean Water Act §§ 101(a)(6), 104, 105; Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) § 3(c)(2)(A); Safe Drinking Water Act (SDWA) § 1458; Toxic Substances Control Act (TSCA).

⁸⁷ For more information, please see: <https://www.epa.gov/research/epa-research-solutions-states>.

Research: Safe and Sustainable Water Resources

Research: Safe and Sustainable Water Resources

Program Area: Research: Safe and Sustainable Water Resources
Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2021 Final Actuals	FY 2022 Annualized CR	FY 2023 President's Budget	FY 2023 President's Budget v. FY 2022 Annualized CR
<i>Science & Technology</i>	<i>\$92,719</i>	<i>\$112,250</i>	<i>\$119,286</i>	<i>\$7,036</i>
Total Budget Authority	\$92,719	\$112,250	\$119,286	\$7,036
Total Workyears	367.3	358.1	378.1	20.0

Program Project Description:

The quality and availability of water, upon which human and ecosystem health and a robust economy depend, face myriad challenges. These challenges include aging water infrastructure, contaminants of existing and emerging concern, waterborne pathogens, antimicrobial resistance, harmful algal blooms and hypoxia, stormwater runoff, and water shortages. Many of these concerns are more prevalent in disadvantaged and rural communities, and can be exacerbated by changing climate patterns, for example, higher temperatures and greater frequency, duration and intensity of precipitation, extreme heat, wildland fire, and drought.

To address these current, emerging, and long-term water resource challenges, EPA's Safe and Sustainable Water Resources (SSWR) Research Program produces robust research and scientific analyses for decision-making and the development of innovative, practical solutions for the Agency and its partners to protect and restore America's watersheds and water infrastructure.

SSWR research is integrated with other Office of Research and Development (ORD) national research programs to address water quality concerns related to wildland fire; revitalize land and prevent contamination through work on biosolids and green infrastructure; and ensure the safety of chemicals through research on lead and other chemical contaminants.

Recent Accomplishments of the SSWR Research Program⁸⁸

Contaminants of Emerging Concern:

- **SARS-CoV-2.** EPA collaborated with the Center for Disease Control and the State of Ohio to establish a wastewater monitoring network to detect and quantify SARS-CoV-2. EPA researchers rapidly developed and applied a method to detect SARS-CoV-2 in 12 sewersheds in Ohio. EPA also evaluated analytical approaches to detect variants of concern within wastewater. EPA helped to successfully establish Ohio's SARS-CoV-2 monitoring program and continues to provide analyses from wastewater treatment plants in southwest Ohio.

⁸⁸ For a more complete view of accomplishments, please see: <https://www.epa.gov/research/national-research-programs>.

- **Per- and Polyfluoroalkyl Substances (PFAS).**
 - **PFAS Treatment in Drinking Water.** In 2021, EPA’s Drinking Water Treatability Database was updated to include 37 PFAS chemicals. The database provides information on best practices and technologies for PFAS treatment in drinking water. Information on cost models for PFAS treatment in drinking water also was generated. EPA actively provides support to the Office of Water on PFAS treatment modeling for the development of the PFAS drinking water regulation.
 - **PFAS Analytical Methods.**
 - EPA created and continues to update the PFAS Analytical Website,⁸⁹ which consolidates PFAS analytical and sampling methods for drinking water, groundwater, surface water, wastewater, air, and solids (soils, sediments, biota, and biosolids). The website includes analytical method resources from EPA and other federal agencies and non-governmental organizations, and sampling, data analysis, and laboratory certification resources.
 - EPA finalized and published the SW846 Method 8327 for 24 PFAS in non-drinking water aqueous samples⁹⁰ and drinking water method 533 in support of the upcoming fifth Unregulated Contaminant Monitoring Rule. ORD completed a draft method for total absorbable PFAS in wastewater which is under review by the Office of Water (OW). EPA developed a draft isotope dilution method (Method 1633) for aqueous and solid samples for 40 PFAS in collaboration with the Department of Defense. ORD continues to provide technical support for the multi-laboratory validation of Method 1633 which will be complete by the end of calendar year 2022. Additionally, ORD continues to work with OW for development of a total organic fluorine method in drinking water for future validation.

Science to Support Recreational Water Quality Criteria:

Over the past five years, ORD scientists have published more than 40 peer-reviewed scientific publications providing science to support Recreational Water Quality Criteria recommendations. Notable efforts include the development of Standard Reference Material 2917 in collaboration with the National Institute of Standards and Technology, the public release of EPA Methods 1696 and 1697 for characterization of human fecal pollution in recreational waters, and performance assessment of virus-based fecal indicator methodologies, respectively. ORD research will play an important role in the anticipated EPA Office of Water 2022 Five-Year Review of the 2012 Recreational Water Quality Criteria.

Harmful Algal Blooms (HABs): In August 2021, ORD research enabled the release of a new tool – CyANWeb – expanding digital platforms beyond its CyAN Android app. The new web tool helps federal, state, tribal, and local partners identify when a harmful algal bloom may be forming in waters where people swim, fish, and boat. The tool uses satellite data for initial detection of a harmful algal bloom in more than 2,000 of the largest U.S. lakes and reservoirs. ORD also

⁸⁹ For more information, please see the following: <https://www.epa.gov/water-research/pfas-analytical-methods-development-and-sampling-research>.

⁹⁰ For more information, please see the following: <https://www.epa.gov/water-research/pfas-analytical-methods-development-and-sampling-research>.

developed a proof of concept for Decision Support System expansion to identify sub-watersheds within a larger basin for targeted nutrient control across New England.

FY 2023 Activities and Performance Plan:

Work in this Program provides Cross-Agency Mission and Science Support and is allocated across strategic goals and objectives in the *FY 2022-2026 EPA Strategic Plan*.

In FY 2023, the SSWR Research Program will continue to focus on:

- **Water Infrastructure:**
 - Conduct research and provide technical support to assess the distribution, composition, and potential health risks of known and emerging chemical and biological contaminants. Protocols for sampling lead and identification of lead service lines will support the availability of safe drinking water, especially in disadvantaged communities.
 - Continue work to evaluate SARS-CoV-2 variants with the Ohio Network and determine the viability of live virus in wastewater; and assist states, communities, and utilities to address stormwater and wastewater infrastructure needs through applied models and technical assistance.

- **Climate Change Impacts/Resiliency:**
 - Integrate the impacts of climate change with research on water bodies and water infrastructure, including wildland fire, extreme drought and precipitation events, harmful algal blooms, and other impacts on water quality and availability.
 - Develop risk assessments on stormwater capture for enhanced aquifer recharge.
 - Compare cost and carbon footprint of alternative water sources, develop risk assessments to support safe, fit-for-purpose non-potable use by tribes and states, and expand research to potable use.

- **Harmful Algal Blooms/Nutrients:**
 - Investigate toxicity and health effects from exposure to anatoxin-a, a potent cyanotoxin with neurological effects.
 - Launch a joint EPA and USDA Challenge to better understand the potential role for enhanced efficiency fertilizers (EEFs) by assessing the efficacy of 16 EEFs in greenhouse trials.
 - Complete approaches to prioritize watersheds for restoration and recovery efforts, including a visual tool to illustrate national nutrient inventories and watershed responsiveness to management actions.

- **Recreational Waters and Public Health Protection:** Improve methods for rapid and cost-effective monitoring of waterborne pathogens in recreational waters. For example, improving rapid low-cost methods for real time notifications on the presence of pathogens will inform community decisions to close and reopen beaches more quickly to prevent human illness and unnecessary lost revenue.

- **Microplastics:** Continue refinement of methods to collect, extract, characterize, quantify, and evaluate microplastics in surface water and sediment. Characterizing the smaller micro- and nanoplastic particles will be the emphasis. These standard methods will allow comparability across studies and aid in comprehensive exposure assessment and risk characterization of microplastics. The research also will include activities to assess new methods to rapidly identify microplastics in sediment with a citizen science project.

In addition to the activities listed above, EPA also will conduct research across programs in the following areas:

- **PFAS Research:** PFAS are a class of chemicals of growing concern in the environment, and EPA has committed to taking action to support states, tribes, and local communities understand and manage risks associated with these chemicals. A significant challenge for risk managers at the tribal, state, and local level is how to identify and remove or treat PFAS chemicals that are impacting drinking water supplies. Additional knowledge is needed regarding how to measure and quantify different PFAS chemicals in water, how to remove or treat PFAS chemicals when detected, and how to estimate the cost of different treatment alternatives so that utilities can make informed investment decisions. In FY 2023, EPA will increase its PFAS research efforts, with specific emphasis on implementing the *PFAS Strategic Roadmap*.⁹¹

Within the SSWR Research Program, EPA is:

- Developing and validating standard methods for measuring different PFAS chemicals in water and water treatment residuals (e.g., biosolids);
- Reviewing available literature on effectiveness and cost data for different water treatment technologies applied to different PFAS chemicals; and
- Conducting pilot- and bench-scale testing of the most promising technologies to further evaluate effectiveness.

This work is being done in collaboration with water utilities and water treatment technology suppliers. The results of this work will be posted to EPA's public Drinking Water Treatability Database so the information will be widely available to stakeholders.⁹²

- **Lead:** EPA, the Centers for Disease Control and Prevention, and the American Academy of Pediatrics unanimously agree that there is no safe level of lead in a child's blood and that even low levels can result in behavior and learning problems, lower IQ, and other health effects.⁹³ In response to overwhelming scientific consensus and continued public health concern, reducing childhood lead exposure is one of the highest priorities for EPA.⁹⁴

⁹¹ See EPA's PFAS Strategic Roadmap at: https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf

⁹² For more information, please see: <https://iaspub.epa.gov/tdb/pages/general/home.do#content>.

⁹³ For more information, please see: <https://www.cdc.gov/nceh/lead/prevention/blood-lead-levels.htm>.

⁹⁴ For more information, please see: <https://www.epa.gov/lead>.

SSWR research focuses on:

- Establishing reliable models for estimating lead exposure from drinking water;
- Developing improved sampling techniques and strategies for identifying and characterizing lead in plumbing materials, including lead service lines;
- Developing guidance on optimizing lead mitigation strategies; and
- Testing and evaluating treatment processes for removing lead from drinking water. The overall impact of this research will provide information and tools that EPA, states, tribes, utilities, and communities can use to minimize or eliminate lead exposure in drinking water.

Research Planning:

EPA is built around six integrated and transdisciplinary research programs. Each of the six programs is guided by a Strategic Research Action Plan (StRAP) that reflects the research needs of Agency program and regional offices, states, and tribes, and is planned with their active involvement. Each research program is in the process of developing the fourth generation of the StRAPs, which will continue the practice of conducting innovative scientific research aimed at solving the problems encountered by the Agency and its stakeholders.

ORD works with various groups, including communities, to ensure the integrity and value of its research through a variety of mechanisms that include:

- EPA’s Board of Scientific Counselors (BOSC)
 - ORD meets regularly with this committee, which provides advice and recommendations to ORD on technical and management issues of its research programs.
- State Engagement
 - EPA’s state engagement⁹⁵ is designed to inform states about their role within EPA and EPA’s research programs, and to better understand the science needs of state environmental and health agencies.
- Tribal Partnerships
 - Key tribal partnerships are established through the Tribal Science Program which provides a forum for the interaction between tribal and Agency representatives. These interactions identify research of mutual benefit and lead to collaborations on important tribal environmental science issues.

Performance Measure Targets:

(PM RD1) Percentage of ORD research products meeting partner needs.	FY 2022 Target	FY 2023 Target
	93	94

⁹⁵ For more information, please see: <https://www.epa.gov/research/epa-research-solutions-states>.

(PM RD2) Number of ORD activities related to environmental justice that involve or are designed to be applicable to tribes, states, territories, local governments, and communities.	FY 2022 Target	FY 2023 Target
	No Target Established	TBD
(PM RD4) Percentage of ORD environmental justice-related research products meeting partner needs.	FY 2022 Target	FY 2023 Target
	93	94
(PM RD5) Number of actions implemented for EPA scientific integrity objectives.	FY 2022 Target	FY 2023 Target
	No Target Established	21

FY 2023 Change from FY 2022 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$2,993.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (+\$116.0) This change to fixed and other costs is an increase due to the recalculation of laboratory fixed costs.
- (+\$250.0) This program change increases funding for EPA’s PFAS research efforts, with specific emphasis on implementing the *PFAS Strategic Roadmap*.
- (+\$3,677.0 / +20.0 FTE) This net program change increases funding and FTE for the Safe and Sustainable Water Resources Program. These FTE will help to address the challenges of aging water infrastructure, contaminants of concern, harmful algal blooms, and diminished water availability. This investment includes \$3.567 million in payroll.

Statutory Authority:

Safe Drinking Water Act (SDWA) § 1442(a)(1); Clean Water Act §§ 101(a)(6), 104, 105; Environmental Research, Development, and Demonstration Authorization Act (ERDDAA); Marine Protection, Research, and Sanctuaries Act (MPRSA) § 203; Title II of Ocean Dumping Ban Act of 1988 (ODBA); Water Resources Development Act (WRDA); Wet Weather Water Quality Act of 2000; Marine Plastic Pollution Research and Control Act of 1987 (MPPRCA); National Invasive Species Act; Coastal Zone Amendments Reauthorization Act (CZARA); Coastal Wetlands Planning, Protection and Restoration Act; Endangered Species Act (ESA); North American Wetlands Conservation Act; Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Toxic Substances Control Act (TSCA).

Research: Sustainable Communities

Research: Sustainable and Healthy Communities

Program Area: Research: Sustainable Communities

Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2021 Final Actuals	FY 2022 Annualized CR	FY 2023 President's Budget	FY 2023 President's Budget v. FY 2022 Annualized CR
<i>Science & Technology</i>	<i>\$112,717</i>	<i>\$133,000</i>	<i>\$141,477</i>	<i>\$8,477</i>
Leaking Underground Storage Tanks	\$303	\$320	\$337	\$17
Inland Oil Spill Programs	\$1,149	\$664	\$674	\$10
Hazardous Substance Superfund	\$13,458	\$16,463	\$16,927	\$464
Total Budget Authority	\$127,626	\$150,447	\$159,415	\$8,968
Total Workyears	442.3	421.8	441.8	20.0

Program Project Description:

EPA's Sustainable and Healthy Communities (SHC) Research Program supports the following broad community-based goals: 1) accelerate the pace of contaminated site cleanups; 2) return contaminated sites to beneficial use in their communities; 3) protect vulnerable groups, such as communities with environmental justice concerns and children; 4) revitalize the most vulnerable communities; and 5) understand the connections between healthy ecosystems, healthy people, and healthy communities. SHC research provides decision-makers with the latest scientific information on how the interrelationships between socio-economic, human health, and environmental factors impact the environmental health of communities. The research and tools generated, including those related to health disparities and social determinants of health, aim to minimize negative, unintended consequences to human health and the environment and promote resilience to the impacts of climate change across communities.

The SHC Research Program has made a commitment to foster environmental, public health, and economic benefits for overburdened communities. Remedial technologies will directly support communities with environmental justice concerns and accelerate solutions for the risks that contaminated sites pose to underserved communities. The SHC program will focus on systems approaches that consider how remediation and other technologies can reduce risk to sensitive populations and improve climate adaptation and climate resilience. SHC will apply an integrated systems approach to incorporate diverse data streams for increased understanding of linkages between the total environment (built, natural and social) and public health to support communities and will highlight climate change and environmental justice related research throughout the program.

Recent Accomplishments of the SHC Research Program include:

- **Beneficial Use of Dredged Materials: Opportunities, Community Benefits, and Applied Guidance (Published in December 2020):**⁹⁶ Federal navigation channels throughout the US are maintained through operations and maintenance dredging of rivers and harbors. Much of this material is disposed through open water or contained disposal facility placement. While dredged materials may contain contaminants, there is a significant amount of material that is clean and may have beneficial uses in society. Thus, there is increased pressure to identify beneficial uses for dredged material, such as contaminated site remediation and aquatic habitat restoration. This project identified barriers and opportunities related to using clean dredged materials to remediate contaminated sites along with providing a tool for municipalities and other agencies to better understand the social and ecological benefits of utilizing dredged materials in cleanups or habitat restoration. The research team utilized and augmented the EPA EcoService Models Library; developed a representative case study database; and produced a report to support decision-making for dredged materials. This project created a foundation of information, a use-refined tool, and a concept map to guide application for different stakeholders in future projects.
- **Supply Chain Emission Factors for US Commodities and Industries (Published in July 2020):**⁹⁷ Researchers developed a comprehensive set of supply chain emission factors covering all categories of goods and services in the US economy. Purchased goods and services and capital goods represent a significant source of emission for many organizations. The final emission factors are available in the Supply Chain Emission Factors for US Industries and Commodities dataset. Organizations can use these supply chain factors to calculate the life cycle greenhouse gas (GHG) emissions/carbon footprints of their purchases, or for reporting Scope 3 GHG emissions under the global Greenhouse Gas Protocol.

FY 2023 Activities and Performance Plan:

Work in this Program provides Cross-Agency Mission and Science Support and is allocated across strategic goals and objectives in the *FY 2022-2026 EPA Strategic Plan*.

SHC's FY 2023 research will focus on three topic areas: 1) Advancing Remediation and Restoration of Contaminated Sites; 2) Materials Management and Beneficial Reuse of Waste; and 3) Integrated Systems Approach to Building Healthy and Resilient Communities. This research will integrate and translate public health, environmental engineering, and ecosystem science to provide:

- Remediation solutions through permanent remedies, accounting for climate change, and innovative treatment technologies for returning contaminated sites to safe and productive use;

⁹⁶ For more information, please see: https://intranet.ord.epa.gov/sites/default/files/2021-01/DMMT%20RESES%20Final%20Report_508.pdf.

⁹⁷ For more information, please see: https://cfpub.epa.gov/si/si_public_record_Report.cfm?dirEntryId=349324&Lab=CESER.

- Tools for sustainable materials management and beneficial reuse of materials; and
- Approaches for revitalizing communities, particularly those that are underserved and overburdened, including but not limited to those impacted by climate change.

The SHC Research Program provides state-of-the-science methods, models, tools, and technologies to the Land and Emergency Management Program for use in programmatic guidance and to support EPA decision makers with in-site cleanup. These approaches will address contaminated sediments and groundwater, as well as health risks posed by vapor intrusion and chemicals of immediate concern, such as per- and polyfluoroalkyl substances (PFAS) and lead. To support prevention of future land contamination problems, SHC develops life cycle analysis tools and explores opportunities for beneficial reuse of materials to reduce environmental impact. Finally, SHC research and development also will provide programs, regional partners, and local communities with research and tools they can apply to assess how they can become more resilient to and adapt to climate change. This community-oriented research is designed to revitalize communities, support the protection of children’s health, and address critical health impacts on vulnerable populations. These efforts support community sustainability and increase community resilience to natural disasters including those impacted by climate change.

Specifically, in FY 2023, SHC Research will conduct research in the following areas:

- **Advancing Remediation and Restoration of Contaminated Sites:** EPA research under this topic will primarily focus on developing and testing remedial alternatives for treating contaminated soils, sediments, groundwater sites, vapor intrusion sites, and sites with PFAS and lead contamination, along with providing technical support to the Office of Land and Emergency Management (OLEM), regions, tribes, and states to translate the research into usable approaches.
- **PFAS Research:** PFAS will continue to be an important research topic for SHC. SHC is specifically researching analytical methods, human exposure, contaminated sites source zones, hard to treat streams such as landfill leachate, fate and transport of PFAS in groundwater, remediation performance (treatability and cost models), immobilization/stabilization of PFAS, and novel remedial technologies. This work provides technical support and assistance to tribes, states, and local communities on issues pertaining to ecological and human health risk assessment and site engineering challenges related to PFAS. In FY 2023, EPA is investing additional funds in PFAS research, with specific emphasis on implementing the *PFAS Strategic Roadmap*.⁹⁸
- **Lead Research:** The SHC Research Program is working to identify locations of high exposures and blood lead levels to target lead sources for mitigation. The research program also will develop innovative methods to clean up lead at Superfund and other contaminated sites and strengthen the scientific basis of the Agency’s lead-related regulatory and clean-up decisions. The SHC Research Program also will enhance models and methods that determine key drivers of blood lead levels to inform regulatory decisions, develop tools to identify and prioritize communities with higher incidence of increased blood lead levels in

⁹⁸ See EPA’s PFAS Strategic Roadmap at: https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf

children, and provide the data needed to reduce uncertainty in lead exposure and risk analysis. EPA's research in this area is essential to support ongoing Agency efforts, as well as filling in the data gaps for federal partners, tribes, states, and local communities.

- **Materials Management and Beneficial Reuse of Waste:** EPA research under SHC's Materials Management and Beneficial Reuse of Waste aims to strengthen the scientific basis for the Nation's materials management decisions and guidance at the tribal, state, and community levels. The overall goal of this research is to increase sustainability through reducing waste and supporting more circular economies, including supporting the implementation of the 2021 National Recycling Strategy. Primary research efforts will focus on developing lifecycle-based assessment tools for sustainable materials management, evaluating the design, application, and use of landfills as well as the degradation of liner material and improved monitoring strategies and their long-term impact on human health and the environment, and developing waste-management methodologies that can minimize adverse impacts to human health and the environment through proposed beneficial use and reuse. This work will include research that increases the effectiveness of food waste campaigns and examines food waste collection and pretreatment technologies from a lifecycle perspective. These efforts support an agencywide goal to reduce domestic food loss and waste by half by the year 2030.⁹⁹
- **Integrated Systems Approach to Building Healthy and Resilient Communities:** The SHC Research Program will evaluate and communicate the benefits from remediation, restoration, and revitalization of contaminated sites and provide community-driven solutions with measurable outcomes. These efforts will help communities meet their needs for building resilience to the impacts of climate change, including the health and well-being of those most vulnerable. Research under the Healthy and Resilient Communities topic will provide the scientific basis for guidance, best practices, and tools to support decisions by the Agency, its stakeholders, tribes, and states to optimize health and well-being outcomes while minimizing unintended consequences. In addition, EPA is investing funds to increase protection of communities located near the fence line of industrial facilities.

Research Planning:

EPA research is built around six integrated and transdisciplinary research programs. Each of the six programs is guided by a Strategic Research Action Plan (StRAP) that reflects the research needs of Agency program and regional offices, states, and tribes, and is planned with their active involvement. Each research program is in the process of developing the fourth generation of the StRAPs, which will continue the practice of conducting innovative scientific research aimed at solving the problems encountered by the Agency and its stakeholders.

The Office of Research and Development (ORD) works with various groups, including communities, to ensure the integrity and value of its research through a variety of mechanisms that include:

⁹⁹ For more information, please visit: <https://www.epa.gov/sustainable-management-food>.

- EPA’s Board of Scientific Counselors (BOSC)
 - ORD meets regularly with this committee, which provides advice and recommendations to ORD on technical and management issues of its research programs.

- State Engagement
 - EPA’s state engagement¹⁰⁰ is designed to inform states about their role within EPA and EPA’s research programs, and to better understand the science needs of state environmental and health agencies.

- Tribal Partnerships
 - Key tribal partnerships are established through the Tribal Science Program which provides a forum for the interaction between tribal and Agency representatives. These interactions identify research of mutual benefit and lead to collaborations on important tribal environmental science issues.

Performance Measure Targets:

(PM RD1) Percentage of ORD research products meeting partner needs.	FY 2022 Target	FY 2023 Target
	93	94
(PM RD2) Number of ORD activities related to environmental justice that involve or are designed to be applicable to tribes, states, territories, local governments, and communities.	FY 2022 Target	FY 2023 Target
	No Target Established	TBD
(PM RD4) Percentage of ORD environmental justice-related research products meeting partner needs.	FY 2022 Target	FY 2023 Target
	93	94
(PM RD5) Number of actions implemented for EPA scientific integrity objectives.	FY 2022 Target	FY 2023 Target
	No Target Established	21

FY 2023 Change from FY 2022 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$3,094.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.

- (+\$106.0) This change to fixed and other costs is an increase due to the recalculation of laboratory fixed costs.

¹⁰⁰ For more information, please see: <https://www.epa.gov/research/epa-research-solutions-states>.

- (+\$1,356.0) This program change increases funding for EPA's PFAS research efforts, with specific emphasis on implementing the *PFAS Strategic Roadmap*.
- (+\$200.0) This program change increases resources to fund protection of communities located near the fence line of industrial facilities.
- (+\$3,721.0 / +20.0 FTE) This net program change increases funding and FTE for the Sustainable and Healthy Communities Research Program. These FTE will help to address the acceleration of cleanup and return of contaminated sites to beneficial use, protection of vulnerable populations, and the revitalization of vulnerable communities. This investment includes \$3.576 million in payroll.

Statutory Authority:

Reorganization Plan No. 3 of 1970, 84 Stat. 2086, as amended by Pub. L. 98-80, 97 Stat. 485 (codified as Title 5 App.) (EPA's organic statute).

Water: Human Health Protection

Drinking Water Programs

Program Area: Ensure Safe Water

Goal: Ensure Clean and Safe Water for All Communities

Objective(s): Ensure Safe Drinking Water and Reliable Water Infrastructure

(Dollars in Thousands)

	FY 2021 Final Actuals	FY 2022 Annualized CR	FY 2023 President's Budget	FY 2023 President's Budget v. FY 2022 Annualized CR
Environmental Programs & Management	\$97,190	\$106,903	\$133,258	\$26,355
<i>Science & Technology</i>	<i>\$4,088</i>	<i>\$4,364</i>	<i>\$6,776</i>	<i>\$2,412</i>
Total Budget Authority	\$101,278	\$111,267	\$140,034	\$28,767
Total Workyears	480.3	475.2	547.2	72.0

Program Project Description:

The Drinking Water Technical Support Center is responsible for a range of activities to address drinking water contamination. The Center:

- leads the collection of national occurrence data for unregulated contaminants in drinking water;
- develops, evaluates, and approves analytical methods that are used to accurately and reliably monitor drinking water contaminants;
- leads the national program under which laboratories are certified to conduct the analyses of drinking water contaminants with approved analytical methods; and,
- collaborates with states and public water systems to implement tools that optimize treatment and improve water quality by helping systems achieve compliance and maximize technical capacity while reducing operational costs.

FY 2023 Activities and Performance Plan:

Work in this program directly supports Goal 5/Objective 5.1, Ensure Safe Drinking Water and Reliable Water Infrastructure in the *FY 2022 - 2026 EPA Strategic Plan*. The program also will support the Agency's Infrastructure Investment and Jobs Act implementation priorities.

In FY 2023, EPA is requesting funding for the Drinking Water Technical Support Center to carry out the activities listed below:

- Lead rule development and implementation activities for the Unregulated Contaminant Monitoring Rule (UCMR), a federal direct implementation program coordinated by EPA, as directed by the Safe Drinking Water Act (SDWA).
 - The data collected pursuant to this rule support the Agency's determination of whether to establish health-based standards to protect public health. Data reporting under the UCMR's fourth cycle (UCMR 4) concluded at the end of calendar year (CY) 2021. EPA compiled and published the final data set for the fourth cycle in FY 2022.

- In December 2021, the Agency published the final rule for the UCMR’s fifth cycle (UCMR 5). EPA is conducting pre-monitoring implementation activities throughout CY 2022 to prepare for the upcoming UCMR 5 sampling period from January 2023 through December 2025.
 - UCMR 5 is the first cycle to implement the monitoring provisions of America’s Water Infrastructure Act of 2018 (AWIA), which requires, subject to the availability of appropriations and adequate laboratory capacity, sampling at all small public water systems (PWSs) serving between 3,300 and 10,000 persons. AWIA also requires monitoring at a representative sample of small PWSs serving fewer than 3,300 persons. EPA implementation efforts need to significantly expand to address a 7.5-fold increase in the number of small-system samples as a result of AWIA.
 - EPA is responsible for managing and funding the small-system monitoring. Key activities for EPA include ensuring laboratories are available to perform the required analyses, managing the field sample collection and sample analysis for small systems, and managing data reporting by large systems. In addition, EPA makes the UCMR data available to state and tribal partners and to the public.
- Lead the development, revision, evaluation, and approval of analytical methods for unregulated and regulated contaminants in drinking water to assess and ensure protection of public health (e.g., polyfluoroalkyl substances [PFAS]). This work supports the activities underway for the Agency’s PFAS Roadmap and is expected to support priorities identified by the EPA Council on PFAS.
 - Implement EPA’s Drinking Water Laboratory Certification Program,¹⁰¹ which sets direction for oversight of state, municipal, and commercial laboratories that analyze drinking water samples. EPA will conduct regional laboratory certification program reviews and deliver laboratory certification officer training courses (chemistry and microbiology) for state and regional representatives. The certification program and trainings will help to ensure the quality of drinking water analyses conducted in FY 2023.
 - Partner with states and water systems to optimize their treatment technology and distribution systems under the drinking water Area Wide Optimization Program (AWOP).¹⁰² AWOP is a highly successful technical/compliance assistance and training program that enhances the ability of public water systems to comply with existing microbial, disinfectant, and disinfection byproduct standards, and to address distribution system integrity and water quality issues. During FY 2023, EPA expects to work with states and tribes to expand efforts to train and assist systems, including those in disadvantaged and tribal communities. This effort includes identifying performance limiting factors at public water systems and developing and applying tailored tools to help them overcome operational challenges, achieve performance and optimization levels, and address health-based compliance challenges. The technical assistance provided by AWOP can be instrumental in supporting public water systems with limited financial capacity to effectively address drinking water quality issues.

¹⁰¹ For more information, please see: <https://www.epa.gov/dwlabcert>.

¹⁰² For more information, please see: <https://www.epa.gov/sdwa/optimization-program-drinking-water-systems>.

Performance Measure Targets:

Work under this program supports Safe Drinking Water Act (SDWA) implementation and compliance and requirements in the Drinking Water State Revolving Fund and Categorical Grant: Public Water System Supervision Programs under the STAG appropriation to support safe drinking water for the nation.

FY 2023 Change from FY 2022 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$187.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (+\$187.0 / +1.0 FTE) This program change is an increase in resources and FTE to support the activities associated with the Evidence Act. This investment includes \$182.0 thousand in payroll.
- (+\$2,038.0 / +4.0 FTE) This program change is an increase in resources and FTE to support regulatory analysis, development and training, and technical assistance for state, tribal, and local communities to address drinking water contaminants (including Lead and PFAS) in their efforts to ensure safe and affordable drinking water. The increase also supports development of the Lead and Copper Rule Revisions and the Unregulated Contaminant Monitoring Rule. This investment includes \$729.0 thousand in payroll.

Statutory Authority:

SDWA.

Congressional Priorities

Water Quality Research and Support Grants

Program Area: Clean and Safe Water Technical Assistance Grants

Goal: Ensure Clean and Safe Water for All Communities

Objective(s): Ensure Safe Drinking Water and Reliable Water Infrastructure

(Dollars in Thousands)

	FY 2021 Final Actuals	FY 2022 Annualized CR	FY 2023 President's Budget	FY 2023 President's Budget v. FY 2022 Annualized CR
Environmental Programs & Management	\$0	\$21,700	\$0	-\$21,700
<i>Science & Technology</i>	<i>\$0</i>	<i>\$7,500</i>	<i>\$0</i>	<i>-\$7,500</i>
Total Budget Authority	\$0	\$29,200	\$0	-\$29,200

Program Project Description:

In FY 2021 and in the FY 2022 Annualized Continuing Resolution, Congress appropriated \$7.5 million in the Science and Technology appropriation to fund high priority water quality and water availability research. EPA was instructed by Congress to award grants on a competitive basis, independent of the Science to Achieve Results (STAR) Program, and to give priority to not-for-profit organizations that: 1) conduct activities that are national in scope; 2) can provide a 25 percent match, including in-kind contributions; and 3) often partner with the Agency.

FY 2023 Activities and Performance Plan:

Resources are proposed for elimination for this Program in FY 2023.

Performance Measure Targets:

EPA's FY 2023 Annual Performance Plan does not include annual performance goals specific to this program.

FY 2023 Change from FY 2022 Annualized Continuing Resolution (Dollars in Thousands):

- (-\$7,500.0) Resources are proposed for elimination for this program in FY 2023. The goals of this program can be accomplished through core statutory programs.

Statutory Authority:

CAA 42 U.S.C. 7401 et seq. Title 1, Part A – Sec. 103 (a) and (d) and Sec. 104 (c); CAA 42 U.S.C. 7402(b) Section 102; CAA 42 U.S.C. 7403(b)(2) Section 103(b)(2); Clinger Cohen Act, 40 U.S.C. 11318; CERCLA (Superfund, 1980) Section 209(a) of Public Law 99-499; Children's Health Act; CWA, Sec. 101 - 121; CWPPRA; CZARA; CZMA 16 U.S.C. 1451 - Section 302; Economy Act, 31 U.S.C. 1535; EISA, Title II Subtitle B; ERDDA, 33 U.S.C. 1251 – Section 2(a); ESA, 16 U.S.C. 1531 - Section 2; FFDCA, 21 U.S.C. Sec. 346; FIFRA (7 U.S.C. s/s 136 et seq. (1996), as amended), Sec. 3(c)(2)(A); FQPA PL 104-170; Intergovernmental Cooperation Act, 31 U.S.C.

6502; MPRSA Sec. 203, 33 U.S.C. 1443; NAWCA; NCPA; National Environmental Education Act, 20 U.S.C. 5503(b)(3) and (b)(11); NEPA of 1969, Section 102; NISA; ODBA Title II; PPA, 42 U.S.C. 13103; RCRA; SDWA (1996) 42 U.S.C. Section 300j-18; SDWA Part E, Sec. 1442 (a)(1); TSCA, Section 10, 15, 26, U.S.C. 2609; USGCRA 15 U.S.C. 2921; WRDA; WRRRA; and WWWQA.