



**United States
Environmental Protection Agency**

FISCAL YEAR 2019

**Justification of Appropriation
Estimates for the Committee
on Appropriations**

Science and Technology

EPA-190-R-18-001

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**Environmental Protection Agency
2019 Annual Performance Plan and Congressional Justification**

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**Environmental Protection Agency
FY 2019 Annual Performance Plan and Congressional Justification**

APPROPRIATION: Science & Technology

Resource Summary Table

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Science & Technology				
Budget Authority	\$723,576.4	\$708,975.0	\$448,965.0	-\$260,010.0
Total Workyears	2,137.0	2,199.7	1,492.4	-707.3

*For ease of comparison, Superfund transfer resources for the audit and research functions are shown in the Superfund account.

Bill Language: Science and Technology

For science and technology, including research and development activities, which shall include research and development activities under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980; necessary expenses for personnel and related costs and travel expenses; procurement of laboratory equipment and supplies; and other operating expenses in support of research and development, \$448,965,000, to remain available until September 30, 2020.

Program Projects in S&T

(Dollars in Thousands)

Program Project	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Clean Air				
Clean Air Allowance Trading Programs	\$6,045.0	\$7,518.0	\$5,739.0	-\$1,779.0
Atmospheric Protection Program	\$7,050.8	\$7,964.0	\$0.0	-\$7,964.0
Federal Support for Air Quality Management	\$7,283.8	\$7,280.0	\$4,031.0	-\$3,249.0
Federal Vehicle and Fuels Standards and Certification	\$98,177.0	\$92,988.0	\$75,135.0	-\$17,853.0
Subtotal, Clean Air	\$118,556.6	\$115,750.0	\$84,905.0	-\$30,845.0
Indoor Air and Radiation				
Indoor Air: Radon Program	\$145.0	\$158.0	\$0.0	-\$158.0
Radiation: Protection	\$2,328.6	\$1,996.0	\$1,000.0	-\$996.0
Radiation: Response Preparedness	\$3,785.0	\$3,658.0	\$3,666.0	\$8.0
Reduce Risks from Indoor Air	\$253.3	\$144.0	\$0.0	-\$144.0
Subtotal, Indoor Air and Radiation	\$6,511.9	\$5,956.0	\$4,666.0	-\$1,290.0
Enforcement				

Program Project	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Forensics Support	\$13,228.8	\$13,576.0	\$10,486.0	-\$3,090.0
Homeland Security				
Homeland Security: Critical Infrastructure Protection	\$9,950.4	\$9,153.0	\$5,216.0	-\$3,937.0
Homeland Security: Preparedness, Response, and Recovery	\$23,161.0	\$23,298.0	\$22,461.0	-\$837.0
Homeland Security: Protection of EPA Personnel and Infrastructure	\$438.0	\$446.0	\$500.0	\$54.0
Subtotal, Homeland Security	\$33,549.4	\$32,897.0	\$28,177.0	-\$4,720.0
IT / Data Management / Security				
IT / Data Management	\$3,342.0	\$3,068.0	\$2,725.0	-\$343.0
Operations and Administration				
Facilities Infrastructure and Operations	\$64,642.7	\$67,875.0	\$68,834.0	\$959.0
Workforce Reshaping	\$0.0	\$0.0	\$5,994.0	\$5,994.0
Subtotal, Operations and Administration	\$64,642.7	\$67,875.0	\$74,828.0	\$6,953.0
Pesticides Licensing				
Pesticides: Protect Human Health from Pesticide Risk	\$2,938.3	\$3,090.0	\$2,406.0	-\$684.0
Pesticides: Protect the Environment from Pesticide Risk	\$2,046.2	\$2,325.0	\$2,122.0	-\$203.0
Pesticides: Realize the Value of Pesticide Availability	\$548.1	\$571.0	\$530.0	-\$41.0
Subtotal, Pesticides Licensing	\$5,532.6	\$5,986.0	\$5,058.0	-\$928.0
Research: Air and Energy				
Research: Air and Energy	\$90,076.2	\$91,282.0	\$30,711.0	-\$60,571.0
Research: Safe and Sustainable Water Resources				
Research: Safe and Sustainable Water Resources	\$104,687.6	\$105,535.0	\$67,261.0	-\$38,274.0
Research: Sustainable Communities				
Research: Sustainable and Healthy Communities	\$142,429.1	\$133,415.0	\$52,549.0	-\$80,866.0
Research: Chemical Safety and Sustainability				
Human Health Risk Assessment	\$40,506.5	\$37,554.0	\$22,267.0	-\$15,287.0
Research: Chemical Safety and Sustainability				
<i>Endocrine Disruptors</i>	\$15,497.0	\$16,142.0	\$10,006.0	-\$6,136.0
<i>Computational Toxicology</i>	\$21,790.5	\$21,266.0	\$17,213.0	-\$4,053.0
<i>Research: Chemical Safety and Sustainability (other activities)</i>	\$51,905.1	\$51,106.0	\$34,518.0	-\$16,588.0

Program Project	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Subtotal, Research: Chemical Safety and Sustainability	\$89,192.6	\$88,514.0	\$61,737.0	-\$26,777.0
Subtotal, Research: Chemical Safety and Sustainability	\$129,699.1	\$126,068.0	\$84,004.0	-\$42,064.0
Water: Human Health Protection				
Drinking Water Programs	\$3,517.0	\$3,495.0	\$3,595.0	\$100.0
Congressional Priorities				
Water Quality Research and Support Grants	\$7,803.4	\$4,072.0	\$0.0	-\$4,072.0
TOTAL S&T	\$723,576.4	\$708,975.0	\$448,965.0	-\$260,010.0

*For ease of comparison, Superfund transfer resources for the audit and research functions are shown in the Superfund account.

Clean Air

Clean Air Allowance Trading Programs

Program Area: Clean Air

Goal: Core Mission

Objective(s): Improve Air Quality

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$15,236.6	\$16,060.0	\$12,574.0	-\$3,486.0
<i>Science & Technology</i>	<i>\$6,045.0</i>	<i>\$7,518.0</i>	<i>\$5,739.0</i>	<i>-\$1,779.0</i>
Total Budget Authority	\$21,281.6	\$23,578.0	\$18,313.0	-\$5,265.0
Total Workyears	68.4	71.4	63.7	-7.7

Program Project Description:

This program is responsible for managing the Clean Air Status and Trends Network (CASTNET), a long-term ambient monitoring network, established under Title IX of the Clean Air Act (CAA) Amendments of 1990, which serves as the nation's primary source for atmospheric data on the dry component of acid deposition, regional ground-level ozone, and other forms of particulate and gaseous air pollution. Used in conjunction with the National Atmospheric Deposition Program's (NADP) wet deposition networks and other ambient air quality networks, CASTNET's long-term datasets and data products are used to determine the effectiveness of national and regional emission control programs. The CASTNET program provides spatial and temporal trends in ambient air quality and atmospheric deposition in non-urban areas and sensitive ecosystems (i.e., National Parks). Maintaining the CASTNET monitoring network continues to be critical for assessing the environmental benefits realized from the Acid Rain Program and regional programs that control transported emissions (thereby reducing secondary pollutant formation of ozone and fine particles).

EPA's Long-Term Monitoring (LTM) program was created to assess the health of water bodies 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 and Pocono 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 (ANC), aluminum, and carbon in streams and lakes in relation to changing pollutant emissions. The LTM program is one of the longest running programs at EPA, providing a longitudinal dataset based on sampling and measurements that go back to 1983.

Clean Air Allowance Trading Programs, established under Title I and IV of the Clean Air Act, help implement the National Ambient Air Quality Standards (NAAQS) and the Acid Rain Program, as well as reduce toxics emissions and regional haze. Pollutants reduced include sulfur

dioxide (SO₂), nitrogen oxides (NO_x), ground-level ozone, fine particulate matter (PM_{2.5}), and mercury. EPA provides assistance to states as they develop, implement, and assess their state and regional programs to address major regional and national air issues from large stationary sources. This assistance has traditionally come in the form of technical analysis, modeling, and emissions monitoring support.

The Cross-State Air Pollution Rule (CSAPR) requires 27 states to limit their state-wide emissions of SO₂ and/or NO_x in order to reduce or eliminate the states' contributions to fine particulate matter and/or ground-level ozone pollution in other states. The emissions limitations are defined in terms of maximum state-wide "budgets" for emissions of annual SO₂, annual NO_x, and/or ozone-season NO_x from each state's large electric generating units (EGUs). In September 2016, EPA finalized an update to CSAPR for the 2008 ozone NAAQS.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 1/Objective 1.1, Improve Air Quality in EPA's FY 2018 - 2022 Strategic Plan. In FY 2019, EPA will:

- Continue quality assurance, analysis, and reporting of environmental data from the CASTNET deposition/rural ozone and LTM surface water monitoring networks.
- Analyze and assess trends in sulfur and nitrogen deposition, rural ozone concentrations, surface water quality, and other indicators of ecosystem health and ambient air quality in non-urban areas of the U.S.
- Assure the continuation of ongoing SO₂ and NO_x emission reductions from power plants in the eastern half of the U.S. by implementing CSAPR and the CSAPR update, and across the contiguous U.S. by implementing the Acid Rain Program.¹
- Ensure accurate and consistent results for the clean air and allowance trading programs. Work will continue on performance specifications and investigating monitoring alternatives and methods to improve the efficiency of monitor certification and emissions data reporting.

Work with states to implement emission reduction programs to comply with CAA Section 110(a)(2)(D)(i)(I) requirements.²

Performance Measure Targets:

(NO _x) Ozone Season emissions of nitrogen oxides (NO _x) from electric power generation sources (tons).	FY 2018 Target	FY 2019 Target
	590,000	580,000

¹ Clean Air Act §§ 110(a)(2)(D) and 401

² For more information on program performance, see <http://www.epa.gov/airmarket/progress/progress-reports.html>.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (-\$1,779.0) This program change reduces support for the program with impacts to the following activities in FY 2019: technical analysis, modeling, and emissions monitoring support to states as they develop, implement, and assess their state and regional programs to address regional and national air issues from large stationary sources, and discontinued reanalysis including enhancement of current EPA IT systems related to multi-state air emissions electronic reporting, monitor certification, and compliance determination.

Statutory Authority:

Clean Air Act.

Federal Support for Air Quality Management

Program Area: Clean Air

Goal: Core Mission

Objective(s): Improve Air Quality

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$127,113.4	\$125,387.0	\$96,097.0	-\$29,290.0
<i>Science & Technology</i>	\$7,283.8	\$7,280.0	\$4,031.0	-\$3,249.0
Total Budget Authority	\$134,397.2	\$132,667.0	\$100,128.0	-\$32,539.0
Total Workyears	812.6	842.0	601.8	-240.2

Program Project Description:

Federal support for the criteria pollutant and air toxics programs includes a variety of tools to characterize ambient air quality and the level of risk to the public from air pollutants and to measure national progress toward improving air quality and reducing associated risks. The Federal Support for Air Quality Management program supports development of State Implementation Plans (SIPs) through modeling and other tools and assists states in implementing, attaining, maintaining, and enforcing the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. The program also develops and provides information, training, and tools to assist state, tribal, and local agencies, as well as communities, to reduce air toxics emissions and risk specific to their local areas. Finally, the program includes activities related to the Clean Air Act's stationary source residual risk and technology review program, which involves an assessment of source categories subject to Maximum Achievable Control Technology (MACT) standards to determine if more stringent standards are needed to further reduce the risks to public health and to determine if the MACT standards should be revised to reflect developments in practices, processes, and control technologies.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 1/Objective 1.1, Improve Air Quality in EPA's FY 2018 - 2022 Strategic Plan. As part of implementing key activities in support of attainment of the NAAQS, EPA will provide states and local air quality agencies with assistance in developing SIPs during FY 2019. EPA also will help states in conducting their SIP demonstrations by providing models, modeling inputs and tools, and technical guidance, identifying the control options available and providing priority guidance to assist them in working toward attaining the NAAQS. EPA will ensure national consistency in how air quality modeling is conducted as part of regulatory decision-making, including federal and state permitting programs as well as how conformity determinations are conducted across the U.S. The Agency will work with states and local air quality 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 top priorities is to fulfill its Clean Air Act (CAA) and court-ordered obligations. Section 112 of the CAA requires that the emissions control bases for all MACT standards be reviewed and updated, as necessary, every eight years. In FY 2019, EPA will continue to conduct risk assessments to determine whether the MACT rules appropriately protect public health. The program will prioritize its work with an emphasis on meeting court-ordered deadlines.

EPA is working with other internal and external stakeholders on improving monitoring systems to fill data gaps and get a better estimate of actual population exposure to toxic air pollution. EPA will continue to provide quality assurance proficiency testing for federal and commercial laboratories that produce data from PM_{2.5} air monitoring systems to ensure quality data for use in determining air quality.

In FY 2019, EPA will work with partners to continue improving emission factors and inventories, including the National Emissions Inventory. This effort includes gathering improved activity data from monitoring equipment and using geographic information systems and satellite remote sensing, where possible, for key point, area, mobile, and fugitive sources, and global emission events.

Performance Measure Targets:

Work under this program supports performance results in the Federal Support for Air Quality Management program under the EPM appropriation.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$523.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$3,772.0/ -3.1 FTE) This program change reflects a reduction to EPA's support of state, tribal, and local agencies for SIP/TIP development as well as activities to reduce air toxic emissions and risks in communities.

Statutory Authority:

Clean Air Act.

Federal Vehicle and Fuels Standards and Certification

Program Area: Clean Air

Goal: Core Mission

Objective(s): Improve Air Quality

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
<i>Science & Technology</i>	<i>\$98,177.0</i>	<i>\$92,988.0</i>	<i>\$75,135.0</i>	<i>-\$17,853.0</i>
Total Budget Authority	\$98,177.0	\$92,988.0	\$75,135.0	-\$17,853.0
Total Workyears	308.2	308.5	296.7	-11.8

Program Project Description:

Under the Federal Vehicle and Fuels Standards and Certification program, EPA develops, implements, and ensures compliance with national emission standards to reduce mobile source related air pollution from light-duty cars and trucks, heavy-duty trucks and buses, nonroad engines and vehicles, and from the fuels that power these engines. The program also evaluates new emission control technology and provides state, tribal, and local air quality managers and transportation planners with access to information on transportation programs and incentive-based programs. As part of ensuring compliance with national emission standards, the program tests vehicles, engines, and fuels, and establishes test procedures for federal emissions and fuel economy standards.

The National Vehicle and Fuel Emissions Laboratory (NVFEL) ensures air quality benefits and fair competition in the marketplace by conducting testing operations on motor vehicles, heavy-duty engines, nonroad engines, and fuels to certify that all vehicles, engines, and fuels that enter the U.S. market comply with all federal clean air and fuel economy standards. The NVFEL conducts vehicle emission tests as part of pre-production tests, certification audits, in-use assessments, and recall programs to ensure compliance with mobile source clean air programs.

EPA works with states and local governments to ensure the technical integrity of the mobile source control emission benefits included in State Implementation Plans (SIPs) and transportation conformity determinations. EPA develops and provides information and tools to assist state, local, and tribal agencies, as well as communities, to reduce air toxics emissions and risks specific to their local areas. Reductions in emissions of mobile source air toxics, such as components of diesel exhaust, are achieved through establishing national emissions standards and partnership approaches working with state, local, and tribal governments, as well as a variety of stakeholder groups.

EPA administers the Renewable Fuel Standard (RFS) program. RFS was created under the Energy Policy Act of 2005 (EPAAct), which amended the Clean Air Act (CAA), and was expanded under the Energy Independence and Security Act of 2007 (EISA). The RFS program requires a certain

volume of renewable fuel to replace or reduce the quantity of petroleum-based transportation fuel, heating oil or jet fuel.

The four renewable fuel categories under the RFS are biomass-based diesel, cellulosic biofuel, advanced biofuel, and total renewable fuel. Obligated parties under the RFS program are refiners or importers of gasoline or diesel fuel. Compliance is achieved by blending renewable fuels into transportation fuel, or by obtaining credits (called “Renewable Identification Numbers,” or RINs) to meet an EPA-specified Renewable Volume Obligation (RVO).

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 1/Objective 1.1, Improve Air Quality in EPA's FY 2018 - 2022 Strategic Plan. The Federal Vehicle and Fuels Standards and Certification program supports the Agency's integrated criteria pollutant and greenhouse gas (GHG) compliance programs by operating test cells that simultaneously measure criteria pollutants and GHG emissions, reviewing certification applications for light-duty vehicles and heavy-duty engines to approve applications for both the criteria pollutant and GHG programs, and examining potential violations.

In FY 2019, the Federal Vehicle and Fuels Standards and Certification program will continue to focus its efforts on certification decisions. The Agency will continue to perform its compliance oversight functions on priority matters. In FY 2019, the Agency also will conduct compliance oversight tests where there is evidence to suggest noncompliance. EPA will continue to conduct testing activities for pre-certification confirmatory testing for emissions and fuel economy for passenger cars.

In FY 2019, EPA anticipates reviewing and approving about 5,275 vehicle and engine emissions certification requests, including light-duty vehicles, heavy-duty diesel engines, nonroad engines, marine engines, locomotives, and others. There has been a significant increase in demand for EPA's certification services over the last two decades, due in part to the addition of certification requirements for marine, other nonroad, and small spark-ignited engines.

EPA uses in-use emissions data provided by light-duty vehicle manufacturers as a means to measure compliance and determine if any follow-up evaluation or testing is necessary. Since calendar year 2000, light-duty vehicle manufacturers have been required, by regulation, to test a number of newer and older in-use vehicles and provide the data to EPA. The Agency receives over 2,100 test results annually. EPA reviews the data and determines if there are any specific vehicles, models, or manufacturers that are failing emissions in-use. EPA will use this information submitted by light-duty manufacturers to determine if there are vehicle models that should be identified for testing for the upcoming model year prior to granting the manufacturer a certificate of conformity which allows the manufacturer to sell vehicles in the U.S.

In FY 2019, EPA will continue to implement the harmonized fuel economy and existing GHG emission standards for light-duty vehicles and heavy-duty vehicles which provide regulatory certainty to the marketplace and spur innovation in vehicle technology. These standards were finalized by EPA in coordination with the National Highway Traffic Safety Administration

(NHTSA) and EPA is responsible for implementing both the emission standards and significant aspects of the fuel economy standards.

In FY 2019, EPA also will oversee compliance with vehicle fuel economy labeling requirements. In past years, EPA conducted in-use audits of manufacturer “coast-down” data revealing issues in manufacturer data submitted to EPA and, as a result, inaccurate fuel economy labels on more than a million vehicles from several well-known manufacturers.

In FY 2019, EPA will continue implementing the Tier 3 standards for light-duty vehicles and certifying manufacturers’ fleets for vehicle Model Year 2020. EPA is responsible for establishing the test procedures needed to measure tailpipe emissions and for verifying manufacturers’ vehicle fuel economy data; as a result, the Agency will deploy its laboratory testing resources to ensure that new cars and trucks are in compliance with the Tier 3 emissions standards.

On March 15, 2017, EPA and the Department of Transportation announced that EPA intends to reconsider the Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle GHG Emissions Standards, issued on January 12, 2017. Consistent with the original schedule, in 2018, EPA intends to make a new Final Determination regarding the appropriateness of the standards. If the Administrator’s Final Determination is that the model year 2022-2025 standards or program should be modified, EPA will make any modifications to the existing rule through a notice-and-comment rulemaking, including the issuing of a Notice of Proposed Rulemaking and a Final Rulemaking.

EPA will continue working with the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) on programs to control conventional pollutant emissions from marine and aircraft engines, respectively. In FY 2019, EPA will work with ICAO on its program to develop international action plans to reduce particulate matter (PM) emissions from international civil aviation.

The Motor Vehicle Emissions Simulator (MOVES) is the Agency’s emission modeling system that estimates emissions for mobile sources at the national, county, and project level for criteria air pollutants, greenhouse gases, and air toxics. In FY 2019, MOVES will support the Agency’s emission control programs, as well as provide critical support to states in their determination of program needs to meet air quality standards. The Agency also will evaluate the schedule for updates to MOVES.

In FY 2019, EPA will continue to provide state and local governments with assistance in developing SIPs and providing assistance with transportation conformity determinations. EPA will continue to work with states and local governments to ensure the technical integrity of the mobile source emission estimates in their SIPs. EPA will assist in identifying control options available and provide guidance, as needed. In addition, EPA will ensure national consistency in how conformity determinations are conducted across the U.S. and in the development of motor vehicle emissions budgets in air quality plans, for use in conformity determinations.

EPA will continue to provide assistance to state and local transportation and air quality agencies working on PM_{2.5} hot-spot analyses. This will help ensure that analyses use the latest

available information and that a measure of consistency exists across the nation. Additionally, EPA will continue partnering with states to support inspection and maintenance (I/M) programs that focus on in-use vehicles and engines. Basic and/or enhanced I/M testing is currently being conducted in over 30 states with technical and programmatic guidance from EPA.

In FY 2019, EPA will continue to work with a broad range of stakeholders to develop targeted, sector-based, and place-based incentives for diesel fleets (including school buses, ports, and freight) to limit emissions from older, pre-2007 diesel engines not subject to stringent emissions standards. Because large numbers of people live near ports and are vulnerable to mobile source diesel emissions, EPA will focus its efforts on reducing mobile source emissions in and around ports. Approximately 39 million people in the U.S. currently live in close proximity to ports and can be exposed to air pollution associated with emissions from diesel engines at ports, including particulate matter, nitrogen oxides, ozone, and air toxics.³ EPA will focus its efforts on reducing mobile source emissions in and around ports. EPA also is working with industry to bring about field testing and emissions testing protocols for a variety of innovative energy-efficient, emissions reducing technologies for the legacy fleet.

EPA will continue to implement the RFS program and to carry out actions required by the EPCA of 2005 and the EISA of 2007, including operating and maintaining the credit trading systems. EISA expanded the renewable fuels provisions of EPCA and requires additional studies in various areas of renewable fuel use. EISA requires that EPA set an annual volume standard for renewable fuels and the 2020 RFS volume requirements are statutorily required to be promulgated in FY 2019.

EISA also requires EPA to develop a comprehensive lifecycle GHG methodology to implement the Act's GHG threshold requirements for the RFS. Producers of new and advanced biofuels regularly seek to qualify their fuels under RFS and EPA will continue to apply its lifecycle analysis to such fuels to evaluate and determine eligibility for the program.

In FY 2019, EPA will maintain oversight of the RFS program and continue to evaluate compliance with RFS provisions through its system, which is used to track the creation, trades, and use of billions of Renewable Identification Numbers (RINs) for compliance. The tracking system handles 4,000 to 6,000 submissions per day, typically averaging more than 20,000 transactions per day, and the generation of more than 1.4 billion RINs per month. RINs are generated with the production of qualifying renewable fuel and are used to achieve national RFS programmatic goals of reducing or replacing the quantity of petroleum-based transportation fuel, heating oil, or jet fuel. In FY 2019, EPA will continue to implement its Fuel and Fuel Additive Registration program. The Agency will prioritize its review and decisions for Part 79 registrations.

³ EPA National Port Strategy Assessment report: <https://www.epa.gov/ports-initiative/national-port-strategy-assessment>.

Performance Measure Targets:

(CRT) Number of certificates of conformity issued that demonstrate that the respective engine, vehicle, equipment, component, or system conforms to all of the applicable emission requirements and may be entered into commerce.	FY 2018 Target	FY 2019 Target
	5,200	5,275

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$582.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$18,435.0/ -11.8 FTE) This program change streamlines technical assistance to states and local governments and focuses the program on core statutory requirements.

Statutory Authority:

Title II of the Clean Air Act; Motor Vehicle Information Cost Savings Act; Alternative Motor Fuels Act of 1988; National Highway System Designation Act; Energy Policy Act of 1992; Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU); Energy Policy Act of 2005; Energy Independence and Security Act of 2007.

Atmospheric Protection Program

Program Area: Clean Air

Goal: Core Mission

Objective(s): Improve Air Quality

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$89,143.7	\$94,788.0	\$13,542.0	-\$81,246.0
<i>Science & Technology</i>	<i>\$7,050.8</i>	<i>\$7,964.0</i>	<i>\$0.0</i>	<i>-\$7,964.0</i>
Total Budget Authority	\$96,194.5	\$102,752.0	\$13,542.0	-\$89,210.0
Total Workyears	217.3	224.1	120.0	-104.1

Program Project Description:

The Climate Protection Program supports implementation and compliance with greenhouse gas (GHG) emission standards for light-duty and heavy-duty vehicles developed under EPA's Federal Vehicle and Fuels Standards and Certification program. Resources under this program also support compliance activities for implementing the National Highway Traffic Safety Administration's (NHTSA) Corporate Average Fuel Economy (CAFE) standards. Under authorities contained in the Clean Air Act and the Energy Policy Act, EPA is responsible for issuing certificates and ensuring compliance with both the GHG and CAFE standards.

FY 2019 Activities and Performance Plan:

Resources and FTE for this program are proposed for elimination in FY 2019.

Performance Measure Targets:

Currently there are no performance measures specific to this program.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (-\$7,964.0/ -33.8 FTE) This program change eliminates the program in the S&T account.

Statutory Authority:

Clean Air Act; Pollution Prevention Act (PPA), §§ 6602-6605; National Environmental Policy Act (NEPA), § 102; Clean Water Act, § 104; Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), § 8001; Energy Policy Act of 2005, § 756.

Indoor Air and Radiation

Radiation: Response Preparedness

Program Area: Indoor Air and Radiation

Goal: Core Mission

Objective(s): Improve Air Quality

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$2,543.1	\$2,573.0	\$2,221.0	-\$352.0
<i>Science & Technology</i>	\$3,785.0	\$3,658.0	\$3,666.0	\$8.0
Total Budget Authority	\$6,328.1	\$6,231.0	\$5,887.0	-\$344.0
Total Workyears	39.7	39.2	31.5	-7.7

Program Project Description:

The National Analytical Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama, and the National Center for Radiation Field Operations (NCRFO) in Las Vegas, Nevada, provide laboratory analyses, field sampling and analyses, and direct scientific support to respond to radiological and nuclear incidents. This work includes measuring and monitoring radioactive materials and assessing radioactive contamination in the environment. This program comprises direct scientific field and laboratory activities to support preparedness, planning, training, and procedure development. In addition, program personnel are members of EPA's Radiological Emergency Response Team (RERT), a component of the Agency's emergency response program, and are trained to provide direct expert scientific and technical assistance. EPA's Office of Radiation and Indoor Air program's RERT asset is identified as an Agency Critical Infrastructure/Key Resource, and is part of the Nuclear Incident Response Team under Department of Homeland Security.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 1/Objective 1.1, Improve Air Quality in EPA's FY 2018 - 2022 Strategic Plan. In FY 2019, EPA's RERT will continue to provide support for federal radiological emergency response and recovery operations under the National Response Framework (NRF) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). They also will support basic field operations (e.g., on-site technical support/consultation, fixed laboratory, and mobile laboratory analyses) to provide rapid and accurate radionuclide analyses of environmental samples.⁴

In FY 2019, NAREL and NCRFO will prioritize and adjust the schedule to develop rapid methods and techniques for the laboratory analysis of samples and rapid deployment capabilities to ensure that field teams and laboratory personnel are ready to provide scientific data, analyses, and updated analytical techniques for radiation emergency response programs across the Agency. Both

⁴ See additional information at: <https://www.epa.gov/radiation/radiological-emergency-response>.

organizations will maintain core levels of readiness for radiological emergency responses; participate in the most critical emergency exercises; provide scientific support to state radiation, solid waste, and health programs that regulate radiation remediation; participate in the Protective Action Guidance (PAG) application; and respond, as required, to radiological incidents.

Performance Measure Targets:

Work under this program supports performance results in Radiation Response Preparedness program under the EPM appropriation.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$317.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$309.0/ -4.3 FTE) This program change reflects a reduction in support activities for preparedness work within the Radiation: Response Preparedness program, including basic laboratory analytic functions, such as the measurement and monitoring of radioactive materials and the assessment of radioactive contamination in the environment.

Statutory Authority:

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); Homeland Security Act of 2002; Atomic Energy Act of 1954; 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); Clean Air Act; Post-Katrina Emergency Management Reform Act of 2006 (PKEMRA); Public Health Service Act (PHSA); Robert T. Stafford Disaster Relief and Emergency Assistance Act; Safe Drinking Water Act (SDWA).

Indoor Air: Radon Program

Program Area: Indoor Air and Radiation

Goal: Core Mission

Objective(s): Improve Air Quality

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$2,985.9	\$3,115.0	\$0.0	-\$3,115.0
<i>Science & Technology</i>	<i>\$145.0</i>	<i>\$158.0</i>	<i>\$0.0</i>	<i>-\$158.0</i>
Total Budget Authority	\$3,130.9	\$3,273.0	\$0.0	-\$3,273.0
Total Workyears	9.2	10.6	0.0	-10.6

Program Project Description:

Title III of the Toxic Substances Control Act (TSCA) authorizes EPA to undertake a variety of activities to address the public health risks posed by exposures to indoor radon. Under the statute, EPA studies the health effects of radon, assesses exposure levels, sets an action level, and advises the public of steps they can take to reduce exposure. For over 30 years EPA's radon program has provided important guidance and significant funding to help states establish their own programs.

FY 2019 Activities and Performance Plan:

Resources and FTE for this program are proposed for elimination in FY 2019. This is a mature program where states have technical capacity to continue this work.

Performance Measure Targets:

Currently there are no performance measures specific to this program.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (-\$158.0) This program change proposes to eliminate funding for the Indoor Air: Radon program.

Statutory Authority:

Title III of the Toxic Substances Control Act (TSCA); Title IV of the Superfund Amendments and Reauthorization Act of 1986 (SARA); Clean Air Act.

Radiation: Protection

Program Area: Indoor Air and Radiation

Goal: Core Mission

Objective(s): Improve Air Quality

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$7,780.1	\$8,519.0	\$2,000.0	-\$6,519.0
<i>Science & Technology</i>	\$2,328.6	\$1,996.0	\$1,000.0	-\$996.0
Hazardous Substance Superfund	\$1,833.6	\$1,972.0	\$1,972.0	\$0.0
Total Budget Authority	\$11,942.3	\$12,487.0	\$4,972.0	-\$7,515.0
Total Workyears	58.9	59.1	25.0	-34.1

Program Project Description:

EPA supports waste site characterization and cleanup by providing field and fixed laboratory environmental radioanalytical data and technical support, radioanalytical training to state and federal partners, and by developing new and improved radioanalytical methods. The National Analytical Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama and the National Center for Radiation Field Operations (NCRFO) in Las Vegas, Nevada provide analytical and field operation support for radioanalytical and mixed waste testing, quality assurance, analysis of environmental samples, field radiological support, and field measurement systems and equipment to support site assessment, cleanup, and response activities in the event of a radiological accident or incident.

Together, these organizations provide technical support for conducting site-specific radiological characterizations and cleanups. They also develop guidance for cleaning up Superfund and other sites that are contaminated with radioactive materials.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 1/Objective 1.1, Improve Air Quality in EPA's FY 2018 - 2022 Strategic Plan. In FY 2019, EPA, in cooperation with states, tribes, and other federal agencies, will provide ongoing site characterization and analytical support for site assessment activities, remediation technologies, and measurement and information systems. EPA also will provide training and direct site assistance, including field surveys and monitoring, laboratory analyses, health and safety, and risk assessment support at sites with actual or suspected radioactive contamination.

Performance Measure Targets:

Currently there are no performance measures specific to this program.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (-\$103.0) This change to fixed and other costs is a decrease due to the recalculation of base workforce costs for existing FTE due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$893.0/ -7.3 FTE) This program change reflects a reduction in support activities at the National Analytical Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama and the National Center for Radiation Field Operations (NCRFO) in Las Vegas, Nevada.

Statutory Authority:

Atomic Energy Act of 1954; 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); Clean Air Act; Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); Energy Policy Act of 1992; Nuclear Waste Policy Act of 1982; Public Health Service Act; Safe Drinking Water Act; Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978; Waste Isolation Pilot Plant Land Withdrawal Act of 1992; Marine Protection, Research, and Sanctuaries Act; Clean Water Act.

Reduce Risks from Indoor Air

Program Area: Indoor Air and Radiation

Goal: Core Mission

Objective(s): Improve Air Quality

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$13,389.1	\$13,242.0	\$0.0	-\$13,242.0
<i>Science & Technology</i>	<i>\$253.3</i>	<i>\$144.0</i>	<i>\$0.0</i>	<i>-\$144.0</i>
Total Budget Authority	\$13,642.4	\$13,386.0	\$0.0	-\$13,386.0
Total Workyears	38.6	40.7	0.0	-40.7

Program Project Description:

Title IV of the Superfund Amendments and Reauthorization Act of 1986 (SARA) authorizes EPA to conduct and coordinate research on indoor air quality, develop and disseminate information, and coordinate efforts at the federal, state, and local levels. EPA conducts field measurements and assessments and provides technical support for indoor air quality remediation, when requested.

FY 2019 Activities and Performance Plan:

Resources and FTE for this program are proposed for elimination in FY 2019. This is a mature program where states have technical capacity to continue this work.

Performance Measure Targets:

Currently there are no performance measures specific to this program.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (-\$144.0/ -1.6 FTE) This program change proposes to eliminate funding for this program.

Statutory Authority:

Title III of the Toxic Substances Control Act (TSCA); Title IV of the Superfund Amendments and Reauthorization Act of 1986 (SARA); Clean Air Act.

Enforcement

Forensics Support

Program Area: Enforcement

Goal: Rule of Law and Process

Objective(s): Compliance with the Law

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
<i>Science & Technology</i>	<i>\$13,228.8</i>	<i>\$13,576.0</i>	<i>\$10,486.0</i>	<i>-\$3,090.0</i>
Hazardous Substance Superfund	\$1,543.6	\$1,097.0	\$1,097.0	\$0.0
Total Budget Authority	\$14,772.4	\$14,673.0	\$11,583.0	-\$3,090.0
Total Workyears	73.6	80.3	52.1	-28.2

Program Project Description:

The Forensics Support program provides expert scientific and technical support for criminal and civil environmental enforcement cases, as well as technical support for the Agency's compliance efforts. EPA's National Enforcement Investigations Center (NEIC) is an environmental forensic center accredited for both laboratory and field sampling operations that generate environmental data for law enforcement purposes. It is fully accredited under International Standards Organization (ISO) 17025, the main standard used by testing and calibration laboratories, as recommended by the National Academy of Sciences.⁵ The NEIC maintains a sophisticated chemistry laboratory and a corps of highly trained inspectors and scientists with expertise across media. The NEIC works closely with EPA's Criminal Investigation Division to provide technical support (e.g., sampling, analysis, consultation, and testimony) to criminal investigations. The NEIC also works closely with EPA's Headquarters and Regional Offices to provide technical support, consultation, on-site inspection, investigation, and case resolution services in support of the Agency's Civil Enforcement program.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 3/Objective 3.1, Compliance with the Law in EPA's FY 2018 - 2022 Strategic Plan. The Forensics Support program provides expert scientific and technical support for EPA's criminal and civil enforcement efforts. In FY 2019, NEIC will continue to streamline its forensics work, and identify enhancements to our sampling and analytical methods, using existing technology. Work to collect and analyze materials in order to characterize contamination, and attribute it to individual sources and/or facilities, will remain the focus into the next fiscal year.

Performance Measure Targets:

Currently there are no performance measures specific to this program.

⁵ Strengthening Forensic Science in the United States: A Path Forward, National Academy of Sciences, 2009, available at: http://www.nap.edu/catalog.php?record_id=12589.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$758.0) This net change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to adjustments in salary, essential workforce support, and benefit costs.
- (+\$3.0) This change to fixed and other costs is an increase due to the recalculation of lab fixed costs.
- (-\$3,851.0/ -27.7 FTE) This program change reflects a focus on analyzing material to attribute it to individual sources or facilities and a reduction in other lab support.

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); Resource Conservation and Recovery Act; Clean Water Act; Safe Drinking Water Act; Clean Air Act; Toxic Substances Control Act; Residential Lead-Based Paint Hazard Reduction Act; Federal Insecticide, Fungicide, and Rodenticide Act; Ocean Dumping Act (i.e., MPRSA); Emergency Planning and Community Right-to-Know Act.

Homeland Security

Homeland Security: Critical Infrastructure Protection

Program Area: Homeland Security

Goal: Core Mission

Objective(s): Provide Clean and Safe Water

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$936.9	\$956.0	\$1,263.0	\$307.0
<i>Science & Technology</i>	\$9,950.4	\$9,153.0	\$5,216.0	-\$3,937.0
Total Budget Authority	\$10,887.3	\$10,109.0	\$6,479.0	-\$3,630.0
Total Workyears	22.5	23.1	18.1	-5.0

Program Project Description:

Under the federal homeland security system, EPA is the Sector-Specific Agency responsible for implementing statutory and Presidential directives relating to homeland security for the water sector. EPA's water security program is implemented through close partnerships with the water sector, state emergency response and water program officials, and other federal agencies—most notably DHS, the U.S. Army Corps of Engineers, and the intelligence community. The water security program is not driven by regulatory requirements on water systems or the states, but instead operates on the basis of cooperative federalism by engaging federal, state, and local entities in defining annual objectives and identifying high priorities for immediate action.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 1/Objective 1.2, Provide Clean and Safe Water in EPA's FY 2018 - 2022 Strategic Plan. This program provides critical resources to coordinate and support protection of the nation's critical water infrastructure from terrorist threats and all-hazard events. Under this homeland security project area, EPA will train about 2,500 water utilities, state officials, and federal emergency responders to become more resilient to any natural or manmade incident that could endanger water and wastewater services. In FY 2019, EPA will provide tools, training, and technical assistance which will address the highest risks confronting the water sector.

Natural Disasters and General Preparedness

Drought, floods, hurricanes, earthquakes, and other natural disasters represent a high risk to the water sector owing to their historical frequency of occurrence and their enormous potential for destruction. As evident from several recent natural disasters, the level of preparedness within the water sector varies significantly—with many utilities lacking an adequate preparedness capability. In FY 2019, EPA will improve the preparedness of the water sector by providing nationwide training sessions to address natural disasters and general preparedness with the objective to train water and wastewater systems, state officials, and emergency response partners.

Specifically:

- EPA will provide in-person trainings and workshops which will include: Incident Command System (ICS)/National Incident Management System (NIMS) training; drought response training; flood response training; state functional exercises (scenarios of hurricane, floods, and earthquakes); resource typing and site access workshops; a regional interstate emergency response exercise (hurricane), etc.
- EPA will conduct tabletop and functional exercises to improve the operation of intra-state and inter-state mutual aid agreements among water utilities.
- EPA will continue to address high priority security areas as identified in the stakeholder generated *2017 Roadmap to a Secure and Resilience Water and Wastewater Infrastructure* with an emphasis on projects addressing the following four priorities: (1) establishing the critical lifeline status of the water and wastewater sector and translate that definition into strong support for the sector's needs and capabilities; (2) improving detection, response, and recovery to contamination incidents; (3) advancing preparedness and improving capabilities of the water and wastewater sector for area-wide loss of water and power; and (4) advancing recognition of vulnerabilities and needed responses related to cyber risk management.
- EPA will revisit two fundamental aspects of improving water security and resilience: risk assessment and emergency response planning.
- EPA will conduct nationwide training sessions with three critical, inter-dependent sectors: health care, emergency services, and energy. Most incidents, particularly natural disasters, have underscored the mutual reliance on the water sector with other lifeline sectors. Through training sessions with officials at the local, state, and federal levels from these other sectors, EPA will seek to improve coordination among critical lifeline sectors.
- EPA will sustain operation of the Water Desk in the Agency's Emergency Operations Center in the event of an emergency by: updating roles/responsibilities; training staff in the incident command structure; ensuring adequate staffing during activation of the desk; and coordinating with EPA's regional field personnel and response partners.
- EPA will develop annual assessments, as required under the National Infrastructure Protection Plan, to describe existing water security efforts and progress in achieving the sector's key metrics.

Water Security Initiative and Water Lab Alliance

The Water Security Initiative designs and demonstrates an effective system for timely detection and appropriate response to drinking water contamination threats and incidents through a pilot program that has broad application to the nation's drinking water utilities in high-threat cities.

The FY 2019 request includes \$2.8 million for necessary WSI Surveillance and Response System (SRS) activities to refine technical assistance products based on the five SRS pilots, implement a certification program for water utilities interested in receiving recognition for adopting contamination warning systems, and provide technical assistance to the dozens of water utilities that seek to leverage EPA's expertise in deploying their own warning system.

In FY 2019, EPA will train about 250 drinking water utilities in the design, operation, and response components of contaminant early warning systems. In FY 2019, specifically:

- EPA's continued efforts to promote the water sector's adoption of Water Quality Surveillance and Response Systems to rapidly detect and respond to water quality problems such as contamination in the distribution system in order to reduce public health and economic consequences through the development of several online training modules and webinars, as well as the provision of in-person direct technical assistance.
- EPA will complete development of its SRS Capabilities Assessment Tool, a web-based, easy-to-use, decision support tool that presents the user with a series of questions by which to assess existing detection and response capabilities, compare these existing capabilities to a target capability, and identify potential enhancements to address gaps between the existing and target capabilities.
- EPA also is exploring the possibility of launching SRS implementation pilots within the water sector - the purpose of which will be to: demonstrate the application of SRS tools to designing and operating an early warning system for contamination events; illustrate additional applications of SRS tools, such as extending the SRS approach to source water monitoring; and identify champions within the industry for implementing surveillance and response systems.

In a contamination event, the sheer volume or unconventional type of samples could quickly overwhelm the capacity or capability of a single laboratory. To address this potential deficiency, EPA has established a national Water Laboratory Alliance (WLA) comprised of laboratories harnessed from the range of existing lab resources from the local (e.g., water utility) to the federal levels (e.g., the Centers for Disease Control and Prevention's (CDC) Laboratory Response Network). In FY 2019, EPA will continue to promote, through exercises, expert workshops, and association partnerships, the Water Laboratory Alliance Plan, which provides a protocol for coordinated laboratory response to a surge of analytical needs. Under WLA, EPA will train, in FY 2019, approximately 100 laboratories in improving their ability to handle potential problems associated with surge capacity and analytical method capabilities during an emergency. In particular:

- EPA will continue work with regional and state environmental laboratories to conduct exercises and continue efforts to automate the exercises enabling laboratories and other members of the water sector to participate in exercises simultaneously and continue the innovative practice of pursuing validation of methods through exercises.
- EPA will expand the membership of the WLA with the intention of achieving nationwide coverage. The WLA has 140 member laboratories that are geographically diverse and can provide a wide range of chemical, biological, and radiological analyses. In order for the WLA to become a robust infrastructure that can cover major population centers and address a diverse array of high priority contaminants, membership must continue to increase.
- EPA will continue to target laboratories located in areas where the Water Laboratory Alliance has both inadequate membership levels and gaps in laboratory analytical capabilities.

- EPA will coordinate with other federal agencies, primarily DHS, CDC, Food and Drug Administration, and Department of Defense, on biological, chemical, and radiological contaminants of high concern, and how to detect and respond to their presence in drinking water and wastewater systems.
- EPA will continue to implement specific recommendations of the Water Decontamination Strategy as developed by EPA and water sector stakeholders (e.g., defining roles and responsibilities of local, state, and federal agencies during an event).

Cybersecurity

Cybersecurity represents a substantial concern for the sector, given the ubiquitous access to critical water treatment systems from the Internet. In FY 2019, EPA will fulfill its obligations under Executive Order (EO) 13636 – Improving Critical Infrastructure Cybersecurity – which designated EPA as the lead federal agency responsible for cybersecurity in the water sector. EPA also will partner with the water sector to promote cybersecurity practices and gauge progress in the sector’s implementation of these practices as directed by the Cybersecurity Enhancement Act of 2014, conducting nationwide training sessions in cybersecurity threats and countermeasures for about 200 water and wastewater utilities. Specifically, in FY 2019:

- EPA will conduct one-day classroom training at locations distributed nationally on water sector cybersecurity. The training will address cybersecurity threats, vulnerabilities, consequences, best practices, and incident response planning.
- EPA will need to update and develop new course materials owing to the evolving nature of the cyber threat.
- EPA also will develop brief, targeted guidance documents for underserved segments of the water sector, such as small systems and technical assistance providers.
- EPA will develop outreach materials to promote the adoption of cybersecurity practices across the water sector.

Performance Measure Targets:

Currently there are no performance measures specific to this program.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (-\$588.0) This change to fixed and other costs is a decrease due to the recalculation of base workforce costs due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$3,349.0/ -7.0 FTE) This program change represents a reduction to the number of nationwide training sessions to address natural disasters, general preparedness, and Water Laboratory Alliance Plan activities.

Statutory Authority:

Safe Drinking Water Act (SDWA), §§ 1431-1435; Clean Water Act; Public Health Security and Bioterrorism Emergency and Response Act of 2002; Emergency Planning and Community Right-to-Know Act (EPCRA), §§ 301-305.

Homeland Security: Preparedness, Response, and Recovery

Program Area: Homeland Security

Goal: Core Mission

Objective(s): Revitalize Land and Prevent Contamination

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
<i>Science & Technology</i>	<i>\$23,161.0</i>	<i>\$23,298.0</i>	<i>\$22,461.0</i>	<i>-\$837.0</i>
Hazardous Substance Superfund	\$33,899.4	\$31,461.0	\$31,752.0	\$291.0
Total Budget Authority	\$57,060.4	\$54,759.0	\$54,213.0	-\$546.0
Total Workyears	128.9	127.4	127.1	-0.3

Program Project Description:

Exposure to hazardous chemicals, microbial pathogens, and radiological materials that are released into the environment could pose catastrophic consequences to the health of first responders and all American citizens. EPA has responsibility, under legislation and Presidential Directives, to remediate contaminated environments affected by incidents such as terrorist attacks, industrial accidents, or natural disasters. EPA's disaster-related responsibilities are described by the following three objectives in the Homeland Security Research Program's (HSRP's) Strategic Research Action Plan (StRAP): (1) protecting America's water systems; (2) remediation of indoor and outdoor contaminated areas, and (3) the development of a nationwide laboratory network with the capability and capacity to analyze for chemical, biological, radiological, and nuclear (CBRN) agents during routine monitoring and in response to terrorist attacks and other disasters.

EPA also is responsible for operating and maintaining the network of near real-time stationary and deployable monitors known as RadNet under the Nuclear/Radiological Incident Annex to the National Response Framework (NRF). This network is critical in responding to large-scale incidents with regional impacts such as Fukushima. This network is identified as an EPA Critical Infrastructure/Key Resource asset. EPA additionally serves as the Sector-Specific Agency (SSA) for the water sector, coordinating water sector-specific risk assessment and management strategies and assessing and mitigating cybersecurity risks with DHS and the sector under Executive Order 13636: Improving Critical Infrastructure Cybersecurity.

Funding will support research to fill critical gaps in EPA's capability to carry out the aforementioned responsibilities that help communities prepare for, absorb, and recover from disasters – safeguarding their economic, environmental, and social well-being. HSRP will continue to build upon its record of providing measurable benefits to its program office and regional partners, and state and local stakeholders through the development of innovative solutions for decontamination and remediation. HSRP will deliver effective tools, methods, information, and guidance to local, state, and federal decision-makers that will address both critical terrorism-related issues and natural or manmade disasters.

Research is planned and prioritized based on the needs of end-users of this science, including regional On-Scene Coordinators⁶ (OSCs), water utility companies, states, and EPA program and regional offices.⁷ Priorities also are informed by lessons learned from EPA response activities, advice from external review boards, such as the Board of Scientific Counselors (BOSC) and the Science Advisory Board (SAB), and participation on Office of Science and Technology Policy (OSTP) subcommittees and workgroups. The HSRP collaborates with state, local, and private sector organizations and key federal agencies⁸ to prioritize research needs and prevent the duplication of scientific and technical work.

Recent Accomplishments:

- **Responding to Water Emergencies – Chemical Threats in Water Systems**

There are approximately 153,000 public drinking water systems and more than 16,000 publicly owned wastewater treatment systems in the United States. More than 80 percent of the U.S. population receives their potable water from these drinking water systems and about 75 percent of the U.S. population has its sanitary sewerage treated by these wastewater systems.⁹ Within the past year, threats to drinking water systems ran the spectrum from toxic chemicals accidentally being introduced into a water system to concerns over an intentional attempt to poison a drinking water system.¹⁰ To prepare for these incidents, HSRP examined the interactions of chemical threats with water infrastructure, premise plumbing, and appliances. Research included full-scale studies of decontamination methods in drinking water distribution system infrastructure (iron and concrete) as well as home plumbing materials (PVC and copper) and appliances. Findings from these studies and decontamination methods will be shared with EPA water programs, associations representing water utilities, and states so that they can incorporate the latest state-of-the-science into their guidance and tools for utilities.

- **Decision Support Tools to Support Remediation**

Remediation decisions during a response to a wide-area contamination incident are complex. Decisions on decontamination approaches can impact the success of the remediation, the amount of wastes to be managed, and, ultimately, public health. To support effective decision making that accounts for these interdependencies, HSRP developed the Waste Estimation Support Tool to examine tradeoffs between decontamination decisions and waste management during a wide-area biological incident. The tool can anticipate affected infrastructure and its composition by using sampling data and a map of the contamination plume in order to assist the Incident Command/Unified Command (IC/UC) in determining the waste streams that will be generated based on their decontamination decision. HSRP also developed DeconST, a remediation decision support tool, for buildings/facilities that are contaminated with chemical threats. This tool presents a comparison of various remediation

⁶ On-Scene Coordinators (OSCs) are the federal officials responsible for monitoring or directing responses to all oil spills and hazardous substance releases reported to the federal government.

⁷ Water programs, Land & Emergency Management programs, and EPA Regions.

⁸ Partners include: Department of Homeland Security (DHS), Department of Defense (DoD), Centers for Disease Control and Prevention (CDC), Federal Bureau of Investigation (FBI), National Institute of Health (NIH), National Science Foundation (NSF), Department of Energy (DOE), and Department of Agriculture (DOA).

⁹ For more information, see: <https://www.dhs.gov/water-and-wastewater-systems-sector>.

¹⁰ These examples include the Corpus Christie drinking water system incident and threats made by ISIS to German water systems.

technologies, estimates waste and cost, and allows decision makers to compare different remediation options.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 1/Objective 1.3, Revitalize Land and Prevent Contamination in EPA's FY 2018 - 2022 Strategic Plan.

- **Characterizing Contamination and Assessing Exposure**

During an incident, EPA oversees and provides support to state and local governments for site characterization¹¹ and remediation of contaminated water systems, and indoor and outdoor areas. HSRP activities in this topic fill critical scientific research gaps by providing the science needed for effective sampling strategy development; developing sampling and analysis methods for biological contaminants, and developing methods to assess exposure pathways for biological contamination to inform all aspects of the response. In FY 2019, HSRP will:

- Develop innovative bio-threat agent sampling and analytical methods for the Selected Analytical Methods (SAM) for Environmental Remediation and Recovery document, available on a publically-accessible website, to support post-incident decisions regarding exposure assessment, remediation, and re-occupancy.¹²
- Develop sample strategy options for characterization after a wide-area biological incident and sampling methods to reduce the logistical burden of characterization.
- Inform sampling and decontamination decision making through the study of the fate and transport of bio-threat agents after a release in an urban environment.

- **Water System Security and Resilience**

As the lead 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.¹³ The following research in this topic describes how HSRP will develop tools and data to address water system contamination and water system disaster resilience. In FY 2019, HSRP will:

- Provide solutions for water contamination incidents by conducting field-scale evaluations of water contamination sensors, decontamination methodologies, and water treatment at the Water Security Test Bed. Data from these studies are made available to water utilities through outreach activities with utilities.
- Develop methods to decontaminate infrastructure and manage contaminated water for priority contaminants, including studying their fate and transport in infrastructure to inform sampling and decontamination strategies.

¹¹ The process of identifying and quantifying the contaminants in environmental samples of a site to determine the nature and extent of contamination present.

¹² To access, please see: <https://www.epa.gov/homeland-security-research/sam>.

¹³ The Water Sector Coordinating Council is a "self-organized, self-run, and self-governed council" composed of water utilities. This council facilitates the development of policy impacting the water sector. The Water Government Coordinating Council was formed as the federal government counterpart to the Water Sector Coordinating Council and is responsible for interagency coordination of efforts related to the water sector.

- **Remediating Wide Areas**

EPA will continue to address critical scientific knowledge gaps in responding to and recovering from wide-area biological attacks on urban centers and public areas. EPA will develop tools, methods, and technologies for decision makers and OSCs to respond to disasters, providing solutions that optimize cleanup efficacy, and minimize cost, recovery time, and unintended consequences. In FY 2019, HSRP will:

- Provide decision makers real-time access to the latest research supporting remediation by developing a database that catalogs data on the effectiveness of decontamination technologies and operational and logistical considerations.
- Improve sampling and decontamination decision-making through the development of a proof-of-concept, virtual-reality training tool that allows the user a simulated sampling and decontamination experience. This tool will support pre-incident training and reduce the time responders spend in the hot zone during a response.
- Develop approaches to improve the capacity to conduct large-scale bio-agent cleanup including methods that are widely available to local, state and federal responders, such as municipal equipment (e.g., street sweepers) and commercial off-the-shelf methods for effective distribution of decontaminants (e.g., pool chemicals).
- Develop scalable decontamination technologies for wide-area use and waste management approaches for chemical, biological, and radiological incidents. For chemical threats, approaches will predict decontamination efficacy and provide a basis for field-scale testing of remediation methods. All methods developed are transitioned to state, local, and federal responders through guidance developed by HSRP's Program Office Partners.¹⁴

Radiation Monitoring

The RadNet fixed monitoring network provides near real-time radiation monitoring coverage near each of the 100 most populous U.S. cities as well as expanded geographic coverage for a total of 140 monitoring sites. The RadNet air monitoring network will provide the Agency, first responders, and the public with greater access to data, and should there be a radiological emergency, improve officials' ability to make decisions about protecting public health and the environment during and after an incident. Additionally, the data will be used by scientists to better characterize the effect of a radiological incident.

In FY 2019, the Agency will continue to operate and maintain the RadNet air monitoring network, providing essential maintenance to routinely operating fixed stations. Fixed stations will operate in conjunction with available deployable monitors during a radiological incident.

¹⁴ Office of Land and Emergency Management's Office of Emergency Management and Office of Resource Conservation and Recovery.

Performance Measure Targets:

(HS1) Percentage of planned research products completed on time by the Homeland Security research program.	FY 2018 Target	FY 2019 Target
	100	100
(HS2) Percentage of planned research outputs delivered to clients and partners to improve their capabilities to respond to contamination resulting from homeland security events and related disasters.	FY 2018 Target	FY 2019 Target
	100	100

The tables reflect the HSRP's annual performance measures. EPA uses these measures to assess its effectiveness in delivering needed products and outputs to clients (decision-makers, states, and local governments).

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$269.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$244.0/ -1.0 FTE) This program change reflects a decrease in FTE and contract dollars used to keep RadNet capabilities current with technology to monitor the nation's air, precipitation, and drinking water for radiation.
- (+\$910.0/ +5.0 FTE) This program change reflects an increase for a focused effort to meet EPA's responsibilities as the water Sector-Specific Agency (SSA) implementing specific statutory and Presidential directives relating to water security.
- (-\$929.0/ -4.0 FTE) This changes EPA's timeline to carry out its mandates to develop strategies and methods for characterizing, decontaminating, and managing waste from an intentional or unintentional release of chemical and radiological agents that results from currently understood threats.
- (-\$843.0/ -0.3 FTE) This program change refocuses resources from the development of tools to support resilience of water systems, including response to contamination incidents, and evaluation of sensors to support detection of contamination.

Statutory Authority:

Atomic Energy Act of 1954; Clean Air Act, §§ 102, 103; Comprehensive Environmental Response Compensation and Liability Act (CERCLA), §§ 104-106; Safe Drinking Water Act (SDWA), §§ 1431-1435, 1442; Robert T. Stafford Disaster Relief and Emergency Assistance Act; National Defense Authorization Act for Fiscal Year 1997, §§ 1411-1412; Public Health Security and Bioterrorism Preparedness Response Act of 2002; Toxic Substances Control Act (TSCA), § 10; Oil Pollution Act (OPA); Pollution Prevention Act (PPA); Resource Conservation and Recovery Act (RCRA); Emergency Planning and Community Right-to-Know Act (EPCRA); Clean Water Act; Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); Federal Food, Drug, and

Cosmetic Act (FFDCA); Food Quality Protection Act (FQPA); Food Safety Modernization Act (FSMA), §§ 203, 208.

Homeland Security: Protection of EPA Personnel and Infrastructure

Program Area: Homeland Security

Goal: Rule of Law and Process

Objective(s): Improve Efficiency and Effectiveness

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$4,918.0	\$5,336.0	\$4,986.0	-\$350.0
<i>Science & Technology</i>	<i>\$438.0</i>	<i>\$446.0</i>	<i>\$500.0</i>	<i>\$54.0</i>
Building and Facilities	\$6,119.2	\$6,631.0	\$6,176.0	-\$455.0
Hazardous Substance Superfund	\$1,306.2	\$934.0	\$934.0	\$0.0
Total Budget Authority	\$12,781.4	\$13,347.0	\$12,596.0	-\$751.0
Total Workyears	5.9	12.2	12.2	0.0

Program Project Description:

This program supports activities to ensure that EPA's physical structures and assets are secure and operational and that certain physical security measures are in place to help safeguard staff in the event of an emergency. These efforts also protect the capability of EPA's vital laboratory infrastructure assets. Specifically, funds within this appropriation support security needs for the National Vehicle and Fuel Emissions Laboratory (NVFEL).

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 3/Objective 3.5, Improve Efficiency and Effectiveness in EPA's FY 2018 - 2022 Strategic Plan.

In FY 2019, the Agency will continue to provide enhanced physical security for the NVFEL and its employees. This funding supports the incremental cost of security enhancements required as part of an Agency security assessment review.

Performance Measure Targets:

Currently there are no performance measures specific to this program.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$55.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$1.0) This program change reduces the budget for infrastructure security at the Agency's National Vehicle and Fuel Emissions Laboratory (NVFEL).

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).

IT/ Data Management/ Security

IT / Data Management

Program Area: IT / Data Management / Security

Goal: Rule of Law and Process

Objective(s): Improve Efficiency and Effectiveness

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$82,580.0	\$83,179.0	\$69,264.0	-\$13,915.0
Science & Technology	\$3,342.0	\$3,068.0	\$2,725.0	-\$343.0
Hazardous Substance Superfund	\$14,691.5	\$13,720.0	\$13,720.0	\$0.0
Total Budget Authority	\$100,613.5	\$99,967.0	\$85,709.0	-\$14,258.0
Total Workyears	441.0	498.3	457.9	-40.4

Program Project Description:

EPA's Information Technology/Data Management (IT/DM) program promotes the use of quality environmental information for informing decisions, improving management, documenting performance, and measuring success, which supports the Agency's mission to protect public health and the environment. Science and Technology (S&T) resources for EPA's IT/DM program fund the following activities: Quality Program,¹⁵ EPA libraries, and One EPA Web.

The Quality Program provides quality policies and practices that are intended to ensure that all environmentally-related data activities performed by or for the Agency will result in the production of data that are of adequate quality to support their intended uses. In order for the data to be used with a high degree of certainty for intended users, the quality of the data must be known and documented. The Quality Program provides Quality Assurance (QA) policies, training, oversight and technical support to assist EPA's programs in implementing quality management systems for all environmental data operations. The Quality Program also oversees the implementation of EPA's Information Quality Guidelines.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 3/Objective 3.5, Improve Efficiency and Effectiveness in EPA's FY 2018 - 2022 Strategic Plan. The Quality Program will continue to provide technical support to all EPA program/regional offices and laboratories in implementing EPA quality policies, procedures and standards. In FY 2019, the Quality Program plans to conduct several Quality Management Plan reviews and Quality System Assessments for selected EPA programs. These oversight activities help ensure the quality of EPA's data for intended uses, including environmental decision-making. Additionally, the Quality Program will provide oversight of EPA's Information Quality Guidelines and facilitate the development of agency responses to public requests for correction of information disseminated by EPA. The Agency's

¹⁵ More information about EPA Quality Program can be found at <http://www.epa.gov/quality>.

S&T resources for IT/DM also will help provide library services to all EPA employees and the public, as well as support the hosting of EPA's websites and Web pages.

Performance Measure Targets:

Currently there are no performance measures specific to this program.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$526.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$869.0/ -3.6 FTE) This program change reflects a reduction to the technical support for conducting quality assurance oversight, training, policy development, and support for agency-wide quality activities.

Statutory Authority:

Federal Information Security Management Act (FISMA); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Clean Air Act (CAA); Clean Water Act (CWA); Toxic Substances Control Act (TSCA); Federal Insecticide Fungicide and Rodenticide Act (FIFRA); Food Quality Protection Act (FQPA); Safe Drinking Water Act (SDWA); Resource Conservation and Recovery Act (RCRA); Government Performance and Results Act (GPRA); Government Management Reform Act (GMRA); Clinger-Cohen Act (CCA); Paperwork Reduction Act (PRA); Freedom of Information Act (FOIA); Controlled Substances Act (CSA).

Operations and Administration

Facilities Infrastructure and Operations

Program Area: Operations and Administration

Goal: Rule of Law and Process

Objective(s): Improve Efficiency and Effectiveness

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$293,997.9	\$305,844.0	\$300,738.0	-\$5,106.0
<i>Science & Technology</i>	<i>\$64,642.7</i>	<i>\$67,875.0</i>	<i>\$68,834.0</i>	<i>\$959.0</i>
Building and Facilities	\$26,065.5	\$27,602.0	\$33,377.0	\$5,775.0
Leaking Underground Storage Tanks	\$502.2	\$793.0	\$773.0	-\$20.0
Inland Oil Spill Programs	\$376.2	\$580.0	\$665.0	\$85.0
Hazardous Substance Superfund	\$69,651.3	\$75,985.0	\$74,144.0	-\$1,841.0
Total Budget Authority	\$455,235.8	\$478,679.0	\$478,531.0	-\$148.0
Total Workyears	323.4	356.7	318.0	-38.7

Program Project Description:

Science & Technology (S&T) resources in the Facilities Infrastructure and Operations program fund rent, utilities, and security. This program also supports centralized administrative activities and support services, including health and safety, environmental compliance and management, facilities maintenance and operations, energy conservation, sustainable buildings programs, and space planning. Funding is allocated for such services among the major appropriations for the Agency.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 3/Objective 3.5, Improve Efficiency and Effectiveness in EPA's FY 2018 – 2022 Strategic Plan. In FY 2019, EPA will continue to invest to reconfigure EPA's workspaces, enabling the Agency to release office space and reduce long-term rent costs, consistent with HR 4465,¹⁶ the *Federal Assets Sale and Transfer Act of 2016*. Between FY 2015 and FY 2022 EPA will have released over 850,000 square feet of space nationwide, resulting in a cumulative annual rent avoidance of nearly \$30 million across all appropriations. These savings help offset EPA's escalating rent and security costs.

S&T resources fund FY 2019 planned laboratory consolidations in Athens, GA, Willamette, OR, and Gross Ile, MI. Planned consolidations through FY 2019 will allow EPA to release an estimated 306,000 square feet of space. For FY 2019, the Agency is requesting \$28.75 million for rent, \$19.66 million for utilities, and \$13.92 million for security in the S&T appropriation.

¹⁶ For additional information, refer to: <https://www.congress.gov/bill/114th-congress/house-bill/4465>, *Federal Assets Sale and Transfer Act of 2016*.

Performance Measure Targets:

(FA1) Reduction in EPA Space (sq. ft. owned and leased).	FY 2018 Target	FY 2019 Target
	241,000	65,000

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$302.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to adjustments in salary, essential workforce support, and benefit costs.
- (+\$299.0) This change to fixed and other costs is an increase due to the recalculation of rent, utilities and security.
- (+\$358.0) This program change reflects an increase to support facility operations to meet basic needs and to fund cost escalation for contracts that support activities like custodial, landscaping, and warehouse activities at EPA's research and development facilities and laboratories.

Statutory Authority:

Federal Property and Administration Services Act; Public Building Act; Robert T. Stafford Disaster Relief and Emergency Assistance Act; Clean Water Act; Clean Air Act; Resource Conservation and Recovery Act (RCRA); Toxic Substances Control Act (TSCA); National Environmental Policy Act (NEPA); Community Environmental Response Facilitation Act (CERFA); Energy Policy Act of 2005; 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).

Workforce Reshaping

Program Area: Operations and Administration

Goal: Rule of Law and Process

Objective(s): Improve Efficiency and Effectiveness

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$0.0	\$0.0	\$25,549.0	\$25,549.0
<i>Science & Technology</i>	<i>\$0.0</i>	<i>\$0.0</i>	<i>\$5,994.0</i>	<i>\$5,994.0</i>
Total Budget Authority	\$0.0	\$0.0	\$31,543.0	\$31,543.0

Program Project Description:

Science and Technology (S&T) resources for the workforce reshaping program support organizational restructuring efforts throughout the Agency. To help achieve its mission, EPA will develop, review and analyze mission requirements and implement options to effectively align and redistribute the Agency's workforce based on program priorities, resource reallocation, and technological advances.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 3/Objective 3.5, Improve Efficiency and Effectiveness in EPA's FY 2018 - 2022 Strategic Plan. Effective workforce reshaping is critical to EPA's ability to accomplish its mission. EPA will be examining our statutory functions and processes to eliminate inefficiencies and streamline our processes. Primary criteria will include effectiveness and accountability, as EPA is focused on greater value and real results. These analyses will likely create a need to reshape the workforce. The Agency anticipates the need to offer voluntary early out retirement authority (VERA) and voluntary separation incentive pay (VSIP), and potentially relocation expenses, as part of the workforce reshaping effort.

Performance Measure Targets:

Currently there are no performance measures specific to this program.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$5,994.0) In support of the reprioritization of agency activities, this increase will support:
 - Voluntary early out retirement authority
 - Voluntary separation incentive pay
 - Workforce support costs for relocation of employees as we realign work assignments.

Statutory Authority:

5 U.S.C. 8336(d)(2) includes the statutory VERA provisions for employees covered by the Civil Service Retirement System. 5 U.S.C. 8414(b)(1)(B) includes the statutory VERA provisions for employees covered by the Federal Employees Retirement System. Section 1313(b) of the Chief Human Capital Officers Act of 2002 (Public Law 107-296, approved November 25, 2002) authorized the VSIP option under regulations issued by OPM, as codified in sections 3521 to 3525 of title 5, United States Code (U.S.C.).

Pesticides Licensing

Pesticides: Protect Human Health from Pesticide Risk

Program Area: Pesticides Licensing

Goal: Core Mission

Objective(s): Ensure Safety of Chemicals in the Marketplace

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$56,911.0	\$55,696.0	\$45,949.0	-\$9,747.0
<i>Science & Technology</i>	\$2,938.3	\$3,090.0	\$2,406.0	-\$684.0
Total Budget Authority	\$59,849.3	\$58,786.0	\$48,355.0	-\$10,431.0
Total Workyears	413.6	418.7	416.5	-2.2

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 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Federal Food, Drug, and Cosmetic Act (FFDCA), as amended by the Food Quality Protection Act (FQPA) of 1996, as well as the Pesticide Registration Improvement Extension Act of 2012¹⁷ (or subsequent legislation), 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 (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, including cumulative and aggregate risks, and ensure extra protection for children. The Agency must balance the risks and benefits of other uses.

EPA's Chemical Safety, Pollution Prevention and Pesticide program operates two laboratories that support the goal of protecting human health and the environment through diverse analytical testing and analytical method development and validation efforts. The laboratories also provide a variety of technical services to EPA, other federal and state agencies, tribal nations, and other organizations.

EPA's Microbiology Laboratory

The Microbiology Laboratory develops and standardizes product efficacy test methods for public health pesticides (i.e., antimicrobial pesticides) and generates data to support programmatic decision-making. Antimicrobial pesticides are essential in combating pathogenic microorganisms on environmental surfaces, including surfaces contaminated with new and emerging pathogens.

¹⁷ Authority provided under the Pesticide Registration Improvement Extension Act of 2012 expired on September 30, 2017. Authority to continue to collect fees has been authorized by H.R. 601 - Continuing Appropriations Act, 2018, and subsequent Continuing Resolutions through February 8, 2018.

The Microbiology Laboratory leads the federal effort on designing and standardizing ways to test important infectious agents such as *Clostridium difficile* (*C. difficile*) and multi-drug resistant *Candida auris*. Deaths related to *C. difficile* (hospital-acquired infections) continue to increase due in part to a stronger germ strain, and have now reached ~14,000 deaths per year. Almost half of the infections occur in people younger than 65, but more than 90 percent of the deaths occur in people 65 and older.¹⁸ The organism has been shown to persist in the hospital environment, and disinfectants are essential to reduce disease transmission. As of August 31, 2017, a total 153 cases of multidrug resistant *Candida auris* infections have been reported to CDC from 10 states in the U.S.¹⁹ This multi-drug resistant *Candida auris* is emerging globally and can cause serious and sometimes fatal fungal infections. Any new emerging human or animal pathogen (H1N1, *Clostridium difficile*, MRSA, etc.) represents a new method-development challenge for evaluating disinfectants. The goal is to standardize the procedures to ensure consistent data from the testing community. In 2017 and at the request of CDC, the laboratory mobilized quickly to develop a new test methodology and efficacy data to ensure that guidance to hospitals is adequate for environmental cleaning and disinfection of the multi-drug resistant *Candida auris*. The laboratory also updated the regulatory guidance and test methods for *C. difficile* in 2017 to ensure the efficacy of antimicrobial products for this pathogen.

The laboratory also is leading efforts to evaluate an internationally harmonized efficacy test method, the Organization for Economic Cooperation and Development (OECD) quantitative test method, as well as methods for *Pseudomonas* and *Staphylococcus* biofilms, feline calcivirus, *Mycobacterium*, and a new quantitative test method for evaluating hospital disinfectant towelette formulations. Final guidance and test methods for registering claims against biofilms were issued in 2017.

The laboratory analyzed data from two collaborative studies in FY 2016 for the towelette method and the virus component of the OECD method. Following data analysis, methods also will be adopted or placed under review at standard-setting organizations such as the American Society for Testing and Materials or Association of Official Analytical Communities. Methods are posted at <https://www.epa.gov/pesticide-analytical-methods/antimicrobial-testing-methods-procedures-developed-epas-microbiology>.

EPA's Analytical Chemistry Laboratory

The Analytical Chemistry Laboratory provides technical review of enforcement methods and method validation and serves as a third-party confirmation laboratory. In addition, the laboratory provides analytical and technical support to Regional Offices in enforcement cases, such as evaluating possible adverse effects of pesticide use, including contaminated, deficient, or illegally labeled products. The laboratory develops and validates multi-residue pesticide methods to monitor and enforce agricultural uses of pesticides, and to analyze for pesticide residues in water, soil, bees, crops, feeds. Multi-residue methods are a quicker and more cost effective “one-stop-shop” method for multiple (100+) pesticides, based on their mode of action and chemical properties. The laboratory is leading a team of chemists from EPA’s Pesticide Programs, Food and

¹⁸ http://www.cdc.gov/media/releases/2012/p0306_cdifff.html.

¹⁹ <https://www.cdc.gov/fungal/diseases/candidiasis/c-auris-alert-09-17.html>.

Drug Administration, United States Department of Agriculture, and Canada's Pest Management Regulatory Agency in the update of the agency's 860.1360 Residue Chemistry Guidelines for Multi-Residue Methods. The new guidelines, when approved as a replacement for the current guideline (written in 1987), will enable the submission of multi-residue methods for use in enforcement and tolerance setting, based on more cost effective and reliable techniques.

The Analytical Chemistry Laboratory works to standardize analytical methods that provide the Agency with scientifically valid data for use in risk assessment. One example, is the standardization of a tarp testing method to assist EPA in establishing measures to reduce potential exposures from soil fumigants to agricultural workers and bystanders. The work involved developing and validating a method to generate data for determining the permeability of fumigants through agricultural tarps. This data is used to establish a buffer zone credit when agricultural tarps are used, with the least permeable tarp getting the highest buffer zone reduction. They also provide crop growers with information to determine the best tarps for their practices. The method is now standardized by the American Society of Testing and Materials (ASTM) International, and allows tarps manufacturers to generate such data when applying for a buffer zone credit for newly manufactured tarps. The laboratory continues to support EPA by reviewing and commenting on such data.

The Analytical Chemistry Laboratory also operates EPA National Pesticide Standard Repository (NPSR), which collects and maintains pesticide standards (samples of pure active ingredients or technical grade active ingredients for pesticides). It distributes these standards (~5,000 per year) to EPA and other federal, state, and tribal laboratories involved in pesticide use enforcement.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 1/Objective 1.4, Ensure Safety of Chemicals in the Marketplace in EPA's FY 2018 - 2022 Strategic Plan. In FY 2019, the Agency will protect human health by ensuring the availability of appropriate analytical methods for analyzing pesticide residues in food, feed, water, soil, and bees (and their products), and ensuring their suitability for monitoring pesticide residues, and enforcing tolerances. The Microbiology laboratory will continue with efficacy testing of antimicrobials; complete current method development activities; present data to the international community on the OECD collaborative data and determine the course of action with respect to the method; initiate method development on *Legionella*; participate in an industry-led collaborative on *Salmonella*; and initiate a collaborative study with *Trichophyton*. The laboratory will assist with efforts to formulate a new regulatory schematic for evaluating claims based on use of a disinfectant hierarchy for establishing efficacy claims for antimicrobials. Post-registration testing of antimicrobials enables the agency to remove ineffective products from the market. When EPA labs develop new methods, the regulated community is able to register new products for use against emerging pathogens.

Additionally, EPA will continue to do the following in FY2019:

- 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 assessment 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 their enforcement cases
- Operate EPA's National Pesticide Standard Repository (NPSR)
- Verify that antimicrobial pesticides are properly formulated
- Validate, optimize, and standardize a method to determine permeability of agricultural tarps for fumigants

Performance Measure Targets:

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

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$385.0) This net change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$1,069.0/ -1.3 FTE) This program change is a reduction for pesticide program activities from annual appropriations with the intent to increase utilization of pesticide user fee collections. Proposed legislative language accompanying the President's Budget will expand EPA's scope of activities that can be funded with user fees.

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: Core Mission

Objective(s): Ensure Safety of Chemicals in the Marketplace

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$36,654.9	\$38,302.0	\$28,727.0	-\$9,575.0
<i>Science & Technology</i>	\$2,046.2	\$2,325.0	\$2,122.0	-\$203.0
Total Budget Authority	\$38,701.1	\$40,627.0	\$30,849.0	-\$9,778.0
Total Workyears	271.1	269.3	268.4	-0.9

Program Project Description:

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), Section 3(c)(5), states that the Administrator shall register a pesticide if it is determined that, when used in accordance with labeling and common practices, the product “will also not generally cause unreasonable adverse effects on the environment.” FIFRA defines “unreasonable adverse effects on the environment”, as “any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide.”²⁰

In compliance with FIFRA, EPA conducts risk assessments using the latest scientific methods to determine the risks that pesticides pose to human health and ecological effects on plants, animals, and ecosystems that are not the targets of the pesticide. The Agency’s significant regulatory decisions are posted for review and comment to ensure that these actions are transparent and to allow stakeholders, including at-risk populations, to be engaged in decisions that affect their environment. EPA must determine that food and residential uses of pesticides are safe. For other risk concerns, EPA must balance the risks of the pesticides with benefits provided from the use of the product. To avoid unreasonable risks, EPA may impose risk mitigation measures such as modifying use rates or application methods, restricting uses, or denying some or all uses. In some regulatory decisions, EPA may determine that uncertainties in the risk determination need to be reduced and may require monitoring of environmental conditions, such as effects on water sources or the development and submission of additional laboratory or field study data by the pesticide registrant.

In addition to FIFRA responsibilities, the Agency has responsibilities under the Endangered Species Act (ESA).²¹ Under the ESA, EPA must ensure that pesticide regulatory decisions will not destroy or adversely modify designated critical habitat or result in jeopardy to the continued

²⁰ Federal Insecticide, Fungicide and Rodenticide Act. Sections 2 and 3, Definitions, Registration of Pesticides (7 U.S.C. §§ 136, 136a). Available online at <http://www.epa.gov/opp00001/regulating/laws.htm>.

²¹ The Endangered Species Act of 1973 sections 7(a)(1) and 7 (a)(2); Federal Agency Actions and Consultations (16 U.S.C. 1536(a)). Available at U.S. Fish and Wildlife Service, Endangered Species Act of 1973 internet site: <http://www.fws.gov/endangered/laws-policies/section-7.html>.

existence of species listed by the U. S. Fish and Wildlife Service (FWS) or National Marine Fisheries Service (NMFS) as threatened or endangered. Where risks are identified, EPA must work with the FWS and NMFS in a consultation process to ensure these pesticide registrations also will meet the ESA standard.

The national program laboratories of EPA's Pesticide Programs provide a diverse range of environmental data that EPA uses to make informed regulatory decisions. The Analytical Chemistry Laboratory and the Microbiology Laboratory each provide critical laboratory testing and support activities to assist the decision-making processes of the Agency. The laboratories develop methods to test the efficacy of antimicrobial pesticides, evaluate the efficacy of antimicrobial products, and validate analytical chemistry methods to ensure that the Food and Drug Administration (FDA), the United States Department of Agriculture (USDA), EPA, and states have reliable methods to measure and monitor pesticide residues in food and in the environment.

EPA's Microbiology Laboratory

The Microbiology Laboratory ensures that antimicrobial pesticides deliver intended results by evaluating efficacy and registrant claims. The laboratory provides analyses that support the development of efficacy data for pesticides used for the decontamination of buildings (such as chlorine dioxide), supports research on methods and rapid detection assays, and evaluates commercial products used for the remediation and decontamination of sites contaminated with biothreat agents such as *Bacillus anthracis* (commonly known as anthrax). Work conducted by the laboratory led to a regulatory framework for licensing products against *Bacillus anthracis* as outlined in Pesticide Registration Notice 2008-2. Several products are now registered against this biothreat agent. The Microbiology Laboratory is the only EPA laboratory with a select agent registration under the CDC's select agent program, enabling the laboratory to receive, transfer, and work with *Bacillus anthracis*.

EPA's Analytical Chemistry Laboratory

The Analytical Chemistry Branch Laboratory supports the work of EPA to determine the ecological risks that pesticides pose to ecosystems, plants, and animals, such as bees, that are not the targets of the pesticide by bringing new analytical methods online and using in-house expertise to develop and validate multi-residue pesticide analytical methods. Additional benefits are gained by transferring technologies, such as the multi-residue methods, to other EPA organizations and state laboratories for use in monitoring pesticide residues in the environment and ecological systems, and the standard method for testing permeability of agricultural tarps to fumigants, which is currently used by tarp manufacturers to measure the efficiency of newly developed and manufactured tarps.

The Analytical Chemistry Laboratory will continue to provide analytical support to fill data gaps for the pesticide program's risk assessments and for Section 18 emergency exemptions, and to perform studies for use in risk mitigation. Support includes working collaboratively with the United States Geological Survey (USGS), if requested, to identify the presence of pesticides in rivers and streams across the nation. These data will allow USGS and EPA to study the patterns of exposure of agricultural and urban ecosystems to pesticides. The Analytical Chemistry

Laboratory also provides analytical assistance and technical advice to all EPA Regional Offices for use in enforcement cases and reviews and validates analytical methods or studies submitted as part of a pesticide registration.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 1/Objective 1.4, Ensure Safety of Chemicals in the Marketplace in EPA's FY 2018 – 2022 Strategic Plan. The Microbiology Laboratory is working with the Department of Homeland Security to evaluate various materials (wood, concrete, fabric, tile, etc.) for recovery (e.g., extracting the microbe of interest) of high consequence animal pathogens (foot and mouth disease, avian influenza etc.) and the effect of decontamination technologies (including National Stockpile chemicals) on these viruses. The goal is to develop a methodology for evaluating antimicrobial pesticides against these pathogenic agents. These types of hard and porous materials are found at sites requiring remediation due to contamination with non-spore forming high consequence animal pathogens that can have a negative impact on the economy. Particular interest to the Microbiology Laboratory are methods for evaluating decontamination technologies for avian influenza (outbreaks due to migratory birds have affected the poultry industry in the United States).

The Analytical Chemistry Laboratory will continue to focus on analytical method development and validations as well as special studies to address specific short-term, rapid-turnaround priority issues. The laboratory also will continue to provide technical and analytical assistance to EPA's Enforcement and Compliance Assurance program and EPA Regional Offices in support of their enforcement cases. If requested by USGS, analytical support will continue in the sixth year of a multi-year multi agency (EPA and USGS) project to assess the quality of rivers and streams across the United States. The lab will continue to support pesticide registration review and U.S. tarp manufacturers by reviewing the permeability data of fumigants through newly manufactured tarps. In an effort to reduce emission of soil fumigants into the air, the Agency established certain buffer zone credits based on the tarps' permeability: the lower the permeability of a tarp, the lower the emission of fumigants into the air, and more fumigant remains in the soil for pest control. Thus, EPA can allow a greater buffer zone reduction credit. Pollinators are another key contributor to enhancing productivity. The Analytical Chemistry Laboratory will continue to work to understand the effects on pollinators as part of the program's existing registration and registration review processes.

Performance Measure Targets:

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

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (-\$47.0) This change to fixed and other costs is a decrease due to the recalculation of base workforce costs due to adjustments in salary and benefit costs.
- (-\$156.0/ - 0.9 FTE) This program change reflects a reduction for pesticide program activities from annual appropriations with the intent to increase utilization of pesticide user

fee collections. Proposed legislative language accompanying the President's Budget will expand EPA's scope of activities that can be funded with user fees.

Statutory Authority:

Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Endangered Species Act (ESA).

Pesticides: Realize the Value of Pesticide Availability

Program Area: Pesticides Licensing

Goal: Core Mission

Objective(s): Ensure Safety of Chemicals in the Marketplace

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$5,554.3	\$6,191.0	\$5,084.0	-\$1,107.0
<i>Science & Technology</i>	<i>\$548.1</i>	<i>\$571.0</i>	<i>\$530.0</i>	<i>-\$41.0</i>
Total Budget Authority	\$6,102.4	\$6,762.0	\$5,614.0	-\$1,148.0
Total Workyears	34.9	46.5	46.3	-0.2

Program Project Description:

The Chemical Safety and Pollution Prevention's national program laboratories make significant contributions to help the Agency realize the value of pesticides.

EPA's Microbiology Laboratory

The Microbiology Laboratory evaluates and develops data to support Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) Section 18 Emergency Exemption requests to combat emerging or novel pathogens such as prions, new use sites (such as those colonized by biofilms, including sinks, drains, and water lines) and also conducts applied research on new analytical methods for novel antimicrobials. In many cases of new claims or pathogens, there is no standard method for determining efficacy of a pesticide product. For example, it is recognized that microorganisms that exist as biofilm communities may be more resistant to disinfection, which can cause issues in healthcare settings. In FY 2018, the laboratory developed and released new, innovative methods for testing antimicrobial products against biofilms. These biofilm methods will open the marketplace for pesticide registrants to register antimicrobial products to control biofilms in health care settings. The laboratory has technical expertise managing unusual pathogens for which registration of a pesticide might not be economically viable under FIFRA Section 3 Registration. The evaluation of these requests is necessary in order to make pesticides available in the marketplace for these unusual or emergency situations. Examples include the H1N1 virus, prions, foot and mouth disease, Severe Acute Respiratory (SAR) infections, *Clostridium difficile*, and multi-drug resistant *Candida auris*. The Microbiological Laboratory also evaluates the efficacy of antimicrobials to allow EPA to remove ineffective products from the market. In addition, the Microbiology Laboratory provides technical support on numerous non-standard protocols for antimicrobials, including: foggers, chemicals used for inactivation of prions, use of citric acid for control of foot and mouth disease and evaluation of requests from other federal agencies to use paraformaldehyde for decontamination of laboratory environments.

EPA's Analytical Chemistry Laboratory (ACB)

The ACB Laboratory works to protect human health by developing methods and providing analytical support to EPA Regions in their investigation and enforcement of illegal and misuse of pesticide products. The Analytical Chemistry Branch (ACB) Laboratory efforts and successes resulted in standardizing the fumigation tarp protocol through the American Society for Testing and Materials (ASTM) international. They also provided tarp manufacturers with a method to test their newly manufactured tarps before submitting data to the Agency to request a buffer zone credit²² to reduce the required buffer zone, when a fumigant is used as pest control in the field.

The ACB Laboratory supports work to protect growers from crop damage caused by application drift. Methods were developed to detect low levels of pesticides as evidence of drift and shared with EPA regional laboratories. The laboratory also provided scientific data to EPA for use in mitigating drift and volatilization of herbicides, such as Dicamba. The Laboratory continues with method development in this area, and with providing technical and analytical support to EPA Regions that are affected by drift of Dicamba products.

The ACB Laboratory works to protect human health by developing methods and providing analytical support to EPA Regions in their investigation and enforcement of illegal and misuse of pesticide products.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 1/Objective 1.4, Ensure Safety of Chemicals in the Marketplace in EPA's FY 2018 – 2022 Strategic Plan. In FY 2019, EPA will realize the benefits of pesticides by operating the National Pesticide Standard Repository and conducting chemistry and efficacy testing for antimicrobials. As the recognized source for expertise in pesticide analytical method development, EPA's laboratories will continue to provide quality assurance and technical support and training to EPA's Regional Offices, state laboratories, and other federal agencies that implement FIFRA.

The Microbiology Laboratory will continue to evaluate Section 18 emergency exemptions and novel protocol requests for new uses and novel pathogens. The Analytical Chemistry Laboratory will continue its work with the IR-4 Global Study and IR-4 Crop Group Validation Study.

Performance Measure Targets:

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

²²<http://www.epa.gov/soil-fumigants/calculating-buffer-zones-guide-applicators>.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (-\$58.0) This change to fixed and other costs is a decrease due to the recalculation of base workforce costs due to adjustments in salary and benefit costs.
- (+\$17.0/ - 0.2 FTE) This program change reflects an increase in funding for pesticide laboratory operations and maintenance activities.

Statutory Authority:

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

Research: Air and Energy

Research: Air and Energy

Program Area: Research: Air and Energy

Goal: Rule of Law and Process

Objective(s): Prioritize Robust Science

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Science & Technology	\$90,076.2	\$91,282.0	\$30,711.0	-\$60,571.0
Total Budget Authority	\$90,076.2	\$91,282.0	\$30,711.0	-\$60,571.0
Total Workyears	281.4	287.8	153.8	-134.0

Program Project Description:

The Air and Energy (A&E) research program provides scientific information to EPA programs and regional offices. The overall research effort in EPA is organized around six integrated and transdisciplinary national research programs. Each program is guided by a Strategic Research Action Plan (StRAP) that is the result of a collaboration with, and supportive of, EPA's program and regional offices.

The resources requested for A&E will support the analysis of research data and publish scientific journal articles to disseminate findings from prior EPA air quality, emissions, and health impacts research. This program also will offer critical science support to provide essential science and tools for policy decisions and public awareness on the topics described below in the FY 2019 Activities and Performance Plan section. The A&E research program relies on successful partnerships with other EPA research programs, offices, academic and industry researchers, states, local and private sector organizations, as well as key federal agencies.

Recent accomplishments in the A&E research program include:

- **Reducing the Environmental Public Health Burden of Wildfires:**

Within the last decade, wildfires have increased in frequency and intensity and now burn more than 7 million acres annually, 40 percent more than previous decades.²³ Wildland fires are a national challenge impacting public and environmental health, as well as the economy. EPA provided leadership on this issue by conducting research to improve affected communities' understanding of wildland fire emissions and provided improved air quality modeling of wildland fire plume rise, transport, and chemical evolution. This information is critical to states impacted by wildland fires in order for them to make timely decisions about fire response. EPA conducted toxicological studies to differentiate how wildland fire smoke impacts human health compared with a typical urban environment, and also how the different phases of combustion (flaming to smoldering) impact human health. This research led to the development of a Wildfire Smoke Guide²⁴ for public health

²³ For more information, see: http://www.nifc.gov/fireInfo/fireInfo_stats_totalFires.html.

²⁴ For more information, see: https://www3.epa.gov/airnow/wildfire_may2016.pdf.

officials, as well as an innovative Smoke Sense mobile application²⁵ for the public impacted by wildfires. The Smoke Sense application provides information on air quality and strategies to protect the users' health from smoke exposure. In the first month after its release on August 1, 2017, there have been 5,000 downloads of the application for use.²⁶

- **Disparities in Public Health Impacts of Air Pollutants:**

More than 120 million Americans live in counties with monitored air at values greater than EPA regulations for at least one criteria pollutant.²⁷ Some Americans experience more symptoms and health impacts related to air pollution than others. EPA scientists examined how a number of factors could affect how an individual responds to exposure to air pollution, including poverty level, lack of access to health care, education, diet, and housing. This research showed that those with cardiovascular disease who live in disadvantaged neighborhoods are more susceptible to air pollution than those living in more affluent neighborhoods.

- **NAAQS and Air Monitoring Support to State Air programs:**

In 2016, about 40 percent of the U.S. population lived in counties with air monitored air values greater than EPA regulations for at least one criteria pollutant. EPA declared three regions in northern Utah as non-attainment areas in 2009. These areas were reclassified as “serious” non-attainment on December 16, 2016. Utilizing EPA’s unique measurement capabilities and expertise, these results aided the Utah Department of Environmental Quality in developing a State Implementation Plan and informing potential control strategies to address PM2.5 NAAQS non-attainment. This research also can be applied to other states with similar pollution problems.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 3/Objective 3.3, Prioritize Robust Science in EPA’s FY 2018 - 2022 Strategic Plan. The A&E program features five related topic areas that include research projects that support EPA’s mission to protect human health and the environment, fulfill the Agency’s legislative mandates and advance cross-agency priorities. The A&E program will continue to measure progress toward environmental health goals, and translate research results to inform communities and individuals about measures to reduce impacts of air pollution. In addition, research personnel will continue to analyze existing data from EPA air quality, emissions and health impacts research, and publish scientific journal articles to disseminate findings associated with these data. To support states and tribes, EPA will deliver state-of-the-art tools for states to use in identifying effective emission reduction strategies to meet national ambient air quality standards and enhance air quality measurement methods used to ascertain compliance with NAAQS.

²⁵ For more information, see: <https://www3.epa.gov/air-research/smoke-sense>.

²⁶ Number derived from internal EPA metrics.

²⁷ Objective 1.1 of Draft FY 2018-2022 EPA Strategic Plan.

Performance Measure Targets:

(AC1) Percentage of planned research products completed on time by the Air and Energy research program.	FY 2018 Target	FY 2019 Target
	100	100

(AC2) Percentage of planned research outputs delivered to clients for use in improving air quality.	FY 2018 Target	FY 2019 Target
	100	100

The table reflects the A&E program's annual performance measures. EPA uses these measures to assess our effectiveness in delivering needed products and outputs to clients and decision-makers at the federal government level.

EPA has established a standing subcommittee under EPA's Board of Scientific Counselors (BOSC) for the A&E program to evaluate its performance and provide feedback to the Agency. In addition, EPA meets with the BOSC and Science Advisory Board (SAB) annually for input on topics related to research program design, science quality, innovation, relevance and impact. EPA will be advised on its strategic research direction as part of the review of the Research and Development Programs' StRAPs.

EPA collaborates with the National Institutes of Health, National Science Foundation, Department of Energy, U.S. Department of Agriculture and the White House's Office of Science and Technology Policy to assess research performance. EPA supports the interagency Science and Technology in America's Reinvestment, Measuring the Effect of Research on Innovation, Competitiveness and Science (STAR METRICS) efforts. ORD's state engagement program is designed to inform states about ORD's research programs and role within EPA, and to enable ORD to better understand the science needs of state environmental agencies. Key partners at the state level include the Environmental Council of the States, with its Environmental Research Institute of the States and the Interstate Technology and Regulatory Council, as well as state media associations such as the Association of Air Pollution Control Agencies and the National Association of Clean Air Agencies.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (-\$1,922.0) This net change to fixed and other costs is a decrease due to the recalculation of base workforce costs due to adjustments in salary, essential workforce support and benefit costs.
- (-\$16,089.0/ -48.5 FTE) This program change eliminates climate change research.
- (-\$32,105.0/ -85.5 FTE) This program change reduces air quality research.
- (-\$10,455.0) This program change eliminates funding for the Science to Achieve Results (STAR) program for FY 2019.

Statutory Authority:

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

Research: Safe and Sustainable Water Resources

Research: Safe and Sustainable Water Resources

Program Area: Research: Safe and Sustainable Water Resources

Goal: Rule of Law and Process

Objective(s): Prioritize Robust Science

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
<i>Science & Technology</i>	<i>\$104,687.6</i>	<i>\$105,535.0</i>	<i>\$67,261.0</i>	<i>-\$38,274.0</i>
Total Budget Authority	\$104,687.6	\$105,535.0	\$67,261.0	-\$38,274.0
Total Workyears	387.7	403.0	266.4	-136.6

Program Project Description:

The Safe and Sustainable Water Resources (SSWR) research program is developing cost-effective, innovative solutions to current, emerging, and long-term water resource challenges for complex chemical and microbial contaminants. The SSWR research program uses a systems approach to develop scientific and technological solutions for the protection of human health and watersheds. The research is being conducted in partnership with other EPA programs, federal and state agencies, academia, non-governmental agencies, public and private stakeholders, and the scientific community. This approach maximizes efficiency, interdisciplinary insights, and integration of results.

SSWR is dedicated to sustaining EPA's focus and commitment to robust research and scientific analysis to inform policy making under the authorities of the Safe Drinking Water Act and Clean Water Act. Our research supports the Office of Water in ensuring clean and safe waters through improved water infrastructure and sustainable water resource management.

The SSWR program is one of six integrated and transdisciplinary national research programs. Each program is guided by a Strategic Research Action Plan (StRAP)²⁸ that is the result of a collaboration with, and supportive of, EPA's program offices and regions.

Recent accomplishments of the SSWR program include:

- **Emerging contaminants:** Per- and polyfluoroalkyl substances (PFAS) contamination is of increasing concern in multiple locations across multiple states (e.g., NC, NH, NJ and WV). PFAS are widely dispersed and persistent environmental pollutants that are easily absorbed by living organisms. There is toxicological evidence that some PFAS have adverse reproductive, developmental and immunological effects.

SSWR researchers are developing laboratory analytical methods, evaluating chemical toxicity, identifying and estimating human exposure to PFAS, identifying drinking water

²⁸ For more information, see: <https://www.epa.gov/research/strategic-research-action-plans-2016-2019>

treatment technologies and providing technical support to EPA regions and states to provide data that can be used to make informed decisions about managing PFAS.

- **Lead Treatment and Remediation:** To support the states and communities in protecting human health from the adverse outcomes of lead exposure, SSWR researchers are currently developing sampling protocols and exposure risk assessment models for lead in drinking water. Researchers also evaluated lead corrosion control treatment strategies in the field with partner utilities and 18 states²⁹ spanning eight EPA regions to inform implementation of the Lead and Copper Rule.
- The Agency's scientists and engineers provided their expertise and participated in EPA's Flint Drinking Water Task Force to assist the State of Michigan and the City of Flint with lead contamination and chlorine residual challenges in their drinking water system.³⁰ The Agency's SSWR research program contribution played a large part in helping to raise chlorine residuals by flushing hydrants, as well as determining where chlorine sampling would take place. The assistance provided by the Agency's research and development program helped Flint move toward a solution to their drinking water crisis.
- **Harmful Algal Blooms (HABs):**³¹ SSWR developed the Cyanobacteria Assessment Network (CyAN) Android mobile application, which is the first platform for immediate HABs decision support for U.S. freshwater systems.³² The CyAN mobile app delivers satellite data to the public in an accessible way that demonstrates its practical value to daily life. The CyAN mobile app is operational and providing weekly data to collaborators. It is currently available to any state regulatory agency or health department for beta testing.
- **Stormwater Management:**³³ SSWR released the Green Infrastructure Modeling Toolkit, which is comprised of five EPA models and tools for stormwater management decisions. A training video and other materials accompany the toolkit as part of EPA's Stormwater Management Guide that has over 8 thousand webpage visits. The toolkit is used by EPA to train staff and for outreach to states, as well as by land use planners and developers.
- **Recreational Water Quality:** Advances were made in the performance of quantitative, molecular methods for waterborne pathogens to provide more robust, same-day notifications of fecal contamination in recreational waters. Method performance and standardization, including developing standards for use by stakeholders, has been evaluated in eight Midwestern rivers, the National Rivers and Streams Assessment, the 2015 National Coastal Condition Assessment study,³⁴ and in a multi-laboratory survey examining U.S. coastal and inland surface waters.

²⁹ California, Colorado, Connecticut, Florida, Illinois, Indiana, Kentucky, Maine, Michigan, Minnesota, North Carolina, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Wisconsin, and Washington, D.C.

³⁰ For more information, see: <https://www.epa.gov/flint>.

³¹ For more information, see: https://cfpub.epa.gov/si/si_public_record_report.cfm?direntid=328451.

³² For more information, see: <https://www.epa.gov/water-research/cyanobacteria-assessment-network-cyan#decision-support>.

³³ For more information, see: <https://www.epa.gov/water-research/green-infrastructure-modeling-toolkit>.

³⁴ For more information, see: <https://www.epa.gov/national-aquatic-resource-surveys/manuals-used-national-aquatic-resource-surveys>.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 3/Objective 3.3, Prioritize Robust Science in EPA's FY 2018 - 2022 Strategic Plan. The SSWR research program's work in FY 2019 will focus explicitly on efforts integral to achieving the Administrator's priorities and informing the Agency's implementation of key environmental regulations by leveraging research in areas of nutrients, harmful algal blooms, watersheds and water infrastructure (including water reuse).

High priority SSWR efforts in FY 2019 include:

- Assist states, communities, and utilities in addressing stormwater and wastewater infrastructure needs through applied models and technical assistance. In concert with the aforementioned assistance, develop risk assessments on stormwater capture for groundwater augmentation and reuse.
- Research and technical support to deliver safe drinking water. Efforts will focus on the complete water cycle—from protecting source waters and wetlands to improving drinking water and wastewater infrastructure and management. Research will assess the distribution, composition, and health impacts of known and emerging, chemical and biological contaminants.
- Improve methods for rapid and cost-effective monitoring of waterborne pathogens in recreational waters.
- Investigate health impacts from exposure to harmful algal/cyanobacteria toxins, and develop innovative methods to monitor, characterize, and predict blooms for early action.
- Support states in prioritizing watersheds for nutrient management and in setting water quality and aquatic life thresholds. These research and communication efforts will help states verify whether investments in implementing nutrient reduction management practices achieve their expected benefits.
- Provide water reuse research support for future EPA guidance on safe, fit-for-purpose potable and non-potable use by states.

Performance Measure Targets:

(SW1) Percentage of planned research products completed on time by the Safe and Sustainable Water Resources research program.	FY 2018 Target	FY 2019 Target
	100	100
(SW2) Percentage of planned research outputs delivered to clients and partners to improve the Agency's capability to ensure clean and adequate supplies of water that support human well-being and resilient aquatic ecosystems.	FY 2018 Target	FY 2019 Target
	100	100

The table reflects the SSWR program's annual performance measures. EPA uses these measures to assess its effectiveness in delivering needed products and outputs to clients (decision-makers, states, and local governments).

EPA is establishing a standing subcommittee under EPA's Board of Scientific Counselors (BOSC) for the SSWR program to evaluate its performance and provide feedback to the Agency. In addition, EPA will meet regularly with both the BOSC and the Science Advisory Board (SAB) to seek their input on topics related to research program design, science quality, innovation, relevance and impact. This includes advising EPA on its strategic research direction as part of the review of the research and development program's StRAPs.

The Agency collaborates with several science agencies and the research community to assess our research performance, such as the National Institutes of Health, National Science Foundation, Department of Energy, Department of Agriculture, U.S. Geological Survey, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Department of Defense, National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, and others. EPA's Office of Research and Development's (ORD's) state engagement program is designed to inform states about ORD's research programs and role within EPA, and to enable ORD to better understand the science needs of state environmental agencies.

Key partners at the state level include the Environmental Council of the States, with its Environmental Research Institute of the States and the Interstate Technology and Regulatory Council, as well as state media associations such as the Association of Clean Water Administrators and the Association of State Drinking Water Administrators. EPA also works with the White House's Office of Science and Technology Policy and supports the interagency Science and Technology in America's Reinvestment—Measuring the Effect of Research on Innovation, Competitiveness and Science (STAR METRICS) effort.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$1,023.0) This net change to fixed and other costs is an increase due to the recalculation of base workforce costs due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$23,134.0/ -79.2 FTE) This program change streamlines funding to the program for research related to technical support and site-specific support; communication and technology transfer efforts; translation of nutrient modeling and monitoring data; and research assisting states to prioritize watersheds and differentiating sources of nutrient overloading.
- (-\$12,752.0/ -57.4 FTE) This program change refocuses resources from research on recovering resources (e.g. nutrients) from wastewater, transformative water systems, life cycle analysis, and research on advancing water systems technologies for FY 2019.
- (-\$3,411.0) This program change eliminates funding for the Science to Achieve Results (STAR) program for FY 2019.

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

Goal: Rule of Law and Process

Objective(s): Prioritize Robust Science

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
<i>Science & Technology</i>	<i>\$142,429.1</i>	<i>\$133,415.0</i>	<i>\$52,549.0</i>	<i>-\$80,866.0</i>
Leaking Underground Storage Tanks	\$358.0	\$318.0	\$320.0	\$2.0
Inland Oil Spill Programs	\$653.4	\$659.0	\$516.0	-\$143.0
Hazardous Substance Superfund	\$12,717.6	\$11,385.0	\$10,885.0	-\$500.0
Total Budget Authority	\$156,158.1	\$145,777.0	\$64,270.0	-\$81,507.0
Total Workyears	459.7	476.3	294.1	-182.2

Program Project Description:

EPA's Sustainable and Healthy Communities (SHC) research program supplies research to support regulatory activities, including protocol development for the National Contingency Plan, and provides on-demand technical support at federal, tribal or state-led cleanup sites and during emergencies. SHC's research products are unique in that they account for the interrelationships between social, economic, health, ecological, and environmental factors.

Program scientists conduct health, environmental engineering, and ecological research and translate these into planning and analysis tools for localities throughout the United States to facilitate regulatory compliance and improve environmental and health outcomes. These tools aim to minimize negative unintended consequences to human health and the environment and promote more robust and efficient infrastructure in built and natural environments.

The overall research effort is organized around six integrated and transdisciplinary national research programs. Each program is guided by a Strategic Research Action Plan (StRAP) that is the result of a collaboration with, and supportive of, EPAs program and regional offices.

Recent accomplishments of the SHC program include:

- **Lead Exposure Estimates in Children:** In light of recent concerns about lead (Pb) contamination, SHC researchers devised a modeling approach to estimate how various sources (drinking water, food, dust, soil, and air) contribute to blood lead levels in infants and young children. Findings present "...a state-of-the-science methodology that can guide a health-based benchmark for Pb in drinking water and also can be applied to other media."³⁵ By improving lead exposure estimates for its primary sources, the work can

³⁵ "Children's Lead Exposure: A Multimedia Modeling Analysis to Guide Public Health Decision-Making", https://ehp.niehs.nih.gov/ehp1605/?utm_source=rss&utm_medium=rss&utm_campaign=ehp1605.

guide national and local public health decisions and actions aimed at minimizing total lead exposure.

- **Developing Guidelines for Evaluating the Post-Closure Care (PCC) Period for Hazardous Waste Disposal Facilities:** SHC is evaluating data from eight landfills located throughout the United States that are nearing the end of their 30-year PCC period to quantify the field performance of engineered containment systems. Results – which were finalized in October 2017 – will form the basis for technical guidance to evaluate performance of Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous waste landfills.
- **Adding Six New Metropolitan Areas to *EnviroAtlas*:** *EnviroAtlas*³⁶ –an interactive online mapping system that displays layers of information on environmental quality, health statistics, and socio-economic factors in specific communities– provides local leaders with high resolution data to inform decision making. In 2016, SHC added the metropolitan areas around and including Austin, TX, Cleveland, OH, Des Moines, IA, Memphis, TN, Minneapolis, MN and New York, NY to the Atlas. High-resolution data for New Haven, CT, Baltimore, MD, Birmingham, AL, Chicago, IL, Norfolk, VA, and Brownsville, TX was released in October of 2017.³⁷ The addition of these cities will bring the number of *EnviroAtlas* metropolitan areas to 24, comprising well over 500 cities and towns, with another 12 areas planned for inclusion by the end of FY 2019.³⁸
- **Mapping Private Wells and Site Densities of Leaking Underground Storage Tanks:** State agencies need to identify locations with private wells as a part of the process for conducting site investigations for leaking underground storage tanks and frequently lack the information they need. To help states prioritize their efforts, SHC scientists developed a methodology using available data from Oklahoma that illustrates how to develop estimates of areas of high private well use and tank locations. Continuing work is expected to expand these estimates to the entire United States and increase the resolution of the estimates.
- **Organic Waste Diversion in Columbia, SC:** A group of interested stakeholders have formed a partnership in the region to explore ways to regionally manage their organic materials. To aid this effort, SHC scientists have compiled integrated management strategies that divert organic materials into other beneficial uses, using Columbia, SC as a case study. The stakeholders represented in this partnership include both sources and potential receptors of organic waste, such as the U.S. Army Fort Jackson – the largest and most active initial entry training center in the U.S. Army. Results of this study will be broadly available to other communities facing organic waste issues.
- **Report on bioavailability methods for assessing potential lead exposures of concern to communities from urban contamination:** Lead has long been a concern for children’s health, but the risk from lead can vary among the forms of lead present in the environment.

³⁶ For more information, see: <https://www.epa.gov/enviroatlas>.

³⁷ For more information, see: <https://www.epa.gov/enviroatlas/municipalities-within-enviroatlas-boundaries>.

³⁸ For more information, see: https://www.epa.gov/sites/production/files/2016-07/documents/cominbnd_2016_may.pdf.

Research by SHC scientists indicates that the bioavailability of lead poses a greater risk than the total soil lead concentrations. This distinction has important implications for remediating lead contamination and assessing risk at a given site.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 3/Objective 3.3, Prioritize Robust Science in EPA's FY 2018 - 2022 Strategic Plan. More specifically, SHC's FY 2019 research will focus explicitly on conducting research to support regulatory activities and protocol development for the National Oil and Hazardous Substances Pollution Contingency Plan and provide on-demand technical support at federal-, tribal-, or state-managed cleanup sites, as well as assistance during emergencies. The Agency conducts health, environmental engineering, and ecological research and prepares planning and analysis tools for localities nationwide to use in facilitating regulatory compliance and improving environmental and health outcomes. EPA scientists also will assess the impact of pollution (e.g. health impact assessments) on such vulnerable groups as children, tribes, environmental justice communities, and other susceptible populations.

Resources will support the research personnel who analyze existing research data and publish scientific journal articles to disseminate findings associated with the data. Research efforts will include *EnviroAtlas* (a web-based atlas of ecosystem services), conducting valuation of ecosystem services, studying how ecosystem services impact human health, measuring impact on vulnerable populations (e.g. children), and the remediation of contaminated sites.

Performance Measure Targets:

(HC1) Percentage of planned research products completed on time by the Sustainable and Healthy Communities research program.	FY 2018 Target	FY 2019 Target
	100	100
(HC2) Percentage of planned research outputs delivered to clients, partners, and stakeholders for use in pursuing their sustainability goals.	FY 2018 Target	FY 2019 Target
	100	100

The table reflects the SHC program's annual performance measures. EPA uses these measures to assess our effectiveness in delivering needed products and outputs to clients (decision-makers, states, and local governments).

EPA has a standing subcommittee under ORD's Board of Scientific Counselors (BOSC) for the SHC program to evaluate its performance and provide feedback to the Agency. The SHC program will meet regularly with both the BOSC and Science Advisory Board over the next several years to seek their input on topics related to research program design, science quality, innovation, relevance and impact. This includes advising EPA on its strategic research direction midway through the 4-year cycle of StRAPs.

EPA collaborates with the National Institutes of Health, National Science Foundation, Department of Energy, U.S. Department of Agriculture and the White House's Office of Science and Technology Policy (OSTP) to assess research performance. EPA's Office of Research and

Development's (ORD's) state engagement program is designed to inform states about ORD's research programs and role within EPA, and to enable ORD to better understand the science needs of state environmental agencies.

Key partners at the state level include the Environmental Council of the States, with its Environmental Research Institute of the States and the Interstate Technology and Regulatory Council, as well as state media associations such as the Association of State and Territorial Solid Waste Management Officials. EPA supports the interagency Science and Technology in America's Reinvestment, Measuring Effect of Research on Innovation, Competitiveness and Science (STAR METRICS) efforts.³⁹

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (-\$2,458.0) This net change to fixed and other costs is a decrease due to the recalculation of base workforce costs due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$34,423.0/ -90.1 FTE) This program change streamlines research support in FY 2019 by eliminating work related to the following activities:
 - The Ecotox database;
 - EPA's Report on the Environment (ROE); and
 - The inclusion of a data layer in *EnviroAtlas* on ecosystem services and their beneficiaries.
- (-\$16,235.0/ -51.6 FTE) This program change streamlines research efforts across environmental media by eliminating work related to:
 - Research on the life cycle of materials in commerce; and
 - The People, Prosperity, and the Planet (P3) program for college-level competition.
- (-\$19,227.0/ -40.5 FTE) This program change streamlines research on the following:
 - The Health Impact Assessment (HIA) approach for assessing the impact of major planned infrastructure development (e.g. highway construction) at a city scale of governance;
 - Research into the mechanisms of chemical exposures and effects on human health outcomes and well-being, especially research into cumulative effects;
 - Research into the uptake and distribution of contaminants (e.g., lead, arsenic) within vulnerable populations; and
 - Research into the environmental component of children's asthma.
- (-\$8,523.0) This program change eliminates funding for the Science to Achieve Results (STAR) program for FY 2019.

³⁹ STAR METRICS: <https://www.starmetrics.nih.gov/>.

Statutory Authority:

Clean Air Act (CAA); Clean Water Act (CWA); Clinger Cohen Act; Coastal Zone Management Act (CZMA); Environmental Research, Development & Demonstration Authorization Act (ERDDAA); Endangered Species Act (ESA); Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Food Quality and Protection Act (FQPA); Intergovernmental Cooperation Act; Marine Protection, Research and Sanctuaries Act; National Environmental Education Act; National Environmental Policy Act (NEPA); Toxic Substances Control Act, as amended by the *Frank R. Lautenberg Chemical Safety for the 21st Century Act* ; Water Resources Research Act.

Research: Chemical Safety and Sustainability

Research: Chemical Safety and Sustainability

Program Area: Research: Chemical Safety and Sustainability

Goal: Rule of Law and Process

Objective(s): Prioritize Robust Science

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
<i>Science & Technology</i>	<i>\$89,192.6</i>	<i>\$88,514.0</i>	<i>\$61,737.0</i>	<i>-\$26,777.0</i>
Total Budget Authority	\$89,192.6	\$88,514.0	\$61,737.0	-\$26,777.0
Total Workyears	308.6	307.7	240.9	-66.8

Program Project Description:

EPA's Chemical Safety for Sustainability (CSS) research program provides information, tools and methods to make better-informed, more-timely decisions about the thousands of chemicals circulating in the United States. CSS products strengthen the Agency's ability to evaluate and predict human health and ecological impacts from the use and disposal of manufactured chemicals.

The CSS program works with multiple EPA program offices to plan and develop innovative research that directly addresses Agency challenges and informs Agency decisions regarding chemicals. Products delivered by the CSS program inform the implementation of multiple Agency programs including the evaluation of existing and new chemicals (TSCA), development and use of alternative testing protocols (TSCA), chemical prioritization (TSCA, SDWA), evaluation of pesticide registrations (FIFRA), and mitigation activity at Superfund sites (CERCLA).

The CSS program is one of six integrated and transdisciplinary national research programs. Each program is guided by a Strategic Research Action Plan (StRAP) that is the result of a collaboration with, and supportive of, EPA's program and regional offices.

Recent accomplishments include:

- **Public release of the interactive Chemistry Dashboard⁴⁰:** The CSS research program released a new interactive Chemistry Dashboard with chemistry information for over 700,000 chemicals. The Chemistry Dashboard is a gateway to an array of related public domain databases and serves as a hub that links together many EPA databases, providing improved access to data and models for chemicals of interest. The Chemistry Dashboard provides a one-stop-shop for chemical properties, structure, exposure and toxicity information that inform chemical exposure and risk evaluations and assessments by the Agency and outside researchers. A new version of the dashboard was released in August 2017, and includes new lists of toxins, increased amounts of toxicity value data, enhanced

⁴⁰ Interactive Chemistry Dashboard accessible here: <https://comptox.epa.gov/dashboard/>.

performance of searches, and millions of new predicted data points from the Toxicity Estimation Software Tool (TEST).

- **Improved Characterization of Chemical Exposure:** CSS research has enhanced the capacity to rapidly generate quantitative human exposure and internal dose predictions for large numbers of chemicals. CSS efforts are providing curated chemical monitoring, consumer product ingredient, ingredient function, and product usage information through a publicly accessible, web-based platform. The chemicals in consumer products database (CPDat)⁴¹ and the Human Exposure Model (HEM)⁴² are two examples of the tools being developed to better inform total chemical exposures. These tools also are providing efficient evaluation of ecological exposure and risk in support of EPA's Endangered Species Protection program and the Pesticide Registration process.⁴³
- **Public release of the Sequence Alignment to Predict Across Species Susceptibility (SeqAPASS) tool⁴⁴:** SeqAPASS helps fill regulators' knowledge gaps faster and cheaper by comparing and extrapolating toxicity information across species. This tool has proven to be extremely valuable in evaluating risks of exposures from pesticides and pharmaceuticals in wildlife species. The most recent version of the SeqAPASS tool was released in May 2017.
- **Improved definition of unknown chemicals:** CSS investigators have developed advanced analytical and computational tools to detect and identify unknown chemicals in environmental media, biological media and consumer products. Using high-resolution mass spectrometry (MS), it is now possible to translate unknown MS features into "tentative", "probable" and "confirmed" chemical structures and then identify specific chemicals.
- **Evaluating engineered nanomaterials:** CSS investments in the study of nanomaterials have made it possible to develop a comprehensive framework for evaluating the environmental health and safety of engineered nanomaterials. This framework was presented in a review paper published in June 2017 in the journal, *Critical Reviews in Toxicology*.⁴⁵ This framework will help evaluations of health and safety impacts of the release of engineered nanomaterials into the environment in an array of applications including antimicrobials, sun screens, and wood preservatives.

In addition to these specific accomplishments, CSS continues to work with the Agency's Chemical Safety and Pollution Prevention program, providing dedicated staff for the successful implementation of TSCA as amended by the *Frank R. Lautenberg Chemical Safety for the 21st Century Act*. CSS contributes data and tools information for the development of chemical prioritization approaches and provides joint leadership for the development of the TSCA

⁴¹ The CPDat database is linked to the interactive Chemistry Dashboard.

⁴² The Beta version of the Human Exposure Model is scheduled to be released internal to EPA at the end of FY2017 and will be refined based upon input from OPPT.

⁴³ For more information, see: <https://www.epa.gov/pesticide-registration/about-pesticide-registration>.

⁴⁴ For more information, see: <https://blog.epa.gov/blog/tag/seqapass/>. Login here: <https://seqapass.epa.gov/seqapass/>.

⁴⁵ A comprehensive framework for evaluating the environmental health and safety implications of engineered nanomaterials. Link: <http://www.tandfonline.com/doi/full/10.1080/10408444.2017.1328400>.

alternative toxicity testing strategies paper. TSCA requires that the strategies paper be completed by June 2018.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 3/Objective 3.3, Prioritize Robust Science in EPA's FY 2018 - 2022 Strategic Plan. In FY 2019, the CSS research program will continue to produce innovative tools that accelerate the pace of data-driven chemical evaluations, enable EPA and state decisions to be environmentally sound, protective of public health, and support sustainable innovation of chemicals. This work will focus explicitly on efforts integral to achieving the Administrator's priorities. In FY 2019, CSS products will continue to inform the Agency's implementation of key environmental regulations by leveraging research in areas of computational toxicology, rapid exposure and dosimetry, endocrine disrupting chemicals, and emerging materials (such as nanomaterials).

Computational Toxicology (CompTox): EPA continues to be a leader in developing innovative computational and high-throughput methods for efficiently screening large numbers of chemicals in a shorter amount of time, costing less and using fewer vertebrate animals for toxicity testing. In FY 2019, CompTox research will provide essential support to Agency activities across diverse regulatory frameworks (e.g., TSCA, FIFRA, SDWA) and multiple EPA program offices. Development and application of new assessment methodologies add significant efficiency and effectiveness to Agency operations and also provide states with the information to support effective decisions and actions. Specific CompTox activities in FY 2019 include:

- Using ToxCast/Tox21 data to develop high-throughput risk assessments, in particular for chemicals for which adequate information has not been available historically to conduct risk assessments.
- Developing and releasing online software tools to transparently provide information on thousands of chemicals and integrate human health, environmental, and exposure data for a range of decisions, including chemical prioritization decisions.
- Exploring how high-throughput exposure and hazard information can be combined to predict potential for exposure and risk to susceptible subpopulations.

CSS research activities in computational toxicology directly support efforts of the Agency in fulfilling requirements for: chemical evaluation under TSCA, as amended by the *Frank R. Lautenberg Chemical Safety for the 21st Century Act*; pesticide evaluation under FIFRA; chemical testing for endocrine system impacts under the Food Quality Protection Act of 1996 (FQPA) (Public Law 104-170); and chemical evaluation as part of SDWA.

Rapid Exposure and Dosimetry: In FY 2019, the CSS program will continue to provide data, models and tools to characterize total human exposure to environmental chemicals. Human exposure information informs Agency chemical evaluations (such as those conducted in support of TSCA and FIFRA) and chemical prioritizations. This includes the continued development of

advanced analytical and computational tools to detect and identify unknown chemicals in environmental media, biological media and consumer products.

Endocrine Disrupting Chemicals, Emerging Materials and Nanotechnology: CSS will continue to develop and evaluate improved methods to test for impacts on androgen receptors, estrogen receptors, steroidogenesis and thyroid function in support of its core statutory requirements under the FQPA. In addition, CSS will continue to work with OCSPP to define what research is needed on nanomaterials to support the implementation of TSCA.

Performance Measure Targets:

(CS1) Percentage of planned research products completed on time by the Chemical Safety for Sustainability research program.	FY 2018 Target	FY 2019 Target
	100	100
(CS2) Percentage of planned research outputs delivered to clients and partners to improve their capability to advance the environmentally sustainable development, use, and assessment of chemicals.	FY 2018 Target	FY 2019 Target
	100	100

The table reflects the CSS research program’s annual performance measures. EPA uses these measures to assess its effectiveness in delivering needed products and outputs to clients (decision-makers, state, and local governments).

EPA has established a standing subcommittee under EPA’s Board of Scientific Councilors (BOSC) for the CSS program to evaluate the research dimensions of the CSS program as part of its performance and provide feedback to the Agency. EPA will meet regularly with the BOSC and Science Advisory Board to seek their input on topics related to research program design, science quality, innovation, relevance and impact. This includes advising EPA on its strategic research direction as part of the review of the research and development program’s StRAPs.⁴⁶

EPA collaborates with the National Institutes of Health, National Science Foundation, Department of Energy, U.S. Department of Agriculture and the White House’s Office of Science and Technology Policy to assess research performance. EPA’s Office of Research and Development’s (ORD) state engagement program is designed to inform states about ORD’s research programs and role within EPA, and to enable ORD to better understand the science needs of state environmental agencies.

Key partners at the state level include the Environmental Council of the States, with its Environmental Research Institute of the States and the Interstate Technology and Regulatory Council, as well as state media associations such as the Association of State and Territorial Solid Waste Management Officials. EPA supports the interagency Science and Technology in America’s Reinvestment—Measuring the Effect of Research on Innovation, Competitiveness and Science (STAR METRICS) effort. This interagency effort is helping EPA to more effectively measure the impact federal science investments have on society, the environment, and the economy.⁴⁷

⁴⁶ EPA Strategic Research Action Plans: <http://www.epa.gov/research/strategic-research-action-plans-2016-2019>.

⁴⁷ STAR METRICS: <https://www.starmetrics.nih.gov/>.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$1,116.0) This net change to fixed and other costs is an increase due to the recalculation of base workforce costs due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$3,945.0/ -13.1 FTE) This program change reduces resources for the development of high-throughput toxicity testing and the Agency's development of improved methods for chemical evaluations.
- (-\$3,498.0/ -10.7 FTE) This program change reduces research efforts focused on endocrine disrupting chemicals under this program.
- (-\$14,555.0/ -45.0 FTE) This program change reduces funding for the development of virtual tissue models and tools that potentially can be used to conduct chemical toxicity screening to understand impacts on human development and health outcomes, while minimizing the use of animal testing.
- (-\$5,895.0) This program change eliminates funding for the Science to Achieve Results (STAR) program for FY 2019.
- (+2.0 FTE) The realignment of FTE from appropriated Chemical Risk Review and Reduction FTE to TSCA user fee collections results in an increase of 2.0 FTE. Resources have been realigned from the Office of Chemical Safety and Pollution Prevention's Chemical Risk Review and Reduction program to the Office of Research and Development's Chemical Safety and Sustainability program to support risk assessment and evaluation science to support new TSCA requirements.

Statutory Authority:

Clean Air Act §§ 103, 104, 154; Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Children's Health Act; 21st Century Nanotechnology Research and Development Act; Clean Water Act, §§ 101-121; Environmental Research, Development and Demonstration Authorization Act of 1976 (ERDDAA); Federal Food, Drug, and Cosmetic Act (FFDCA); Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Food Quality Protection Act (FQPA); Intergovernmental Cooperation Act; National Environmental Policy Act (NEPA), § 102; Pollution Prevention Act (PPA); Resource Conservation and Recovery Act (RCRA); Safe Drinking Water Act (SDWA); Toxic Substances Control Act (TSCA) as amended by the *Frank R. Lautenberg Chemical Safety for the 21st Century Act*.

Human Health Risk Assessment

Program Area: Research: Chemical Safety and Sustainability

Goal: Rule of Law and Process

Objective(s): Prioritize Robust Science

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
<i>Science & Technology</i>	\$40,506.5	\$37,554.0	\$22,267.0	-\$15,287.0
Hazardous Substance Superfund	\$3,020.5	\$2,805.0	\$5,021.0	\$2,216.0
Total Budget Authority	\$43,527.0	\$40,359.0	\$27,288.0	-\$13,071.0
Total Workyears	169.2	177.6	111.6	-66.0

Program Project Description:

EPA's Human Health Risk Assessment (HHRA) research program is focused on the science of assessments that inform decisions made by EPA and its partners, 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 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The current portfolio of HHRA products include:

Integrated Risk Information System (IRIS): IRIS risk assessments are used by EPA and other health agencies to inform national standards, clean-up levels at local sites, and set advisory levels. These risk assessments inform decisions under the CAA, CWA, SDWA, CERCLA/Superfund, and TSCA. The IRIS Program utilizes a multi-step process which provides opportunities for public, stakeholder, and interagency engagement. The assessments are complex, multidisciplinary evaluations of scientific information, which are developed through a transparent process with independent peer review. IRIS is the only federal program to provide toxicity values for both cancer and non-cancer effects.

Integrated Science Assessments (ISAs): Provide a concise evaluation and synthesis of science necessary to support decisions to retain or revise the National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants (particulate matter, ozone, lead, sulfur oxides, nitrogen oxides, and carbon monoxide) as required every five years by sections 108(a)(2) and 109(d)(1) of the Clean Air Act.⁴⁸ ISAs also inform the benefit-cost analyses that support the regulations designed to allow states and local areas to meet the NAAQS.

Community and Site-specific Risk: Develop Provisional Peer-Reviewed Toxicity Values (PPRTVs) and exposure assessment tools to help inform EPA's timely response to contaminated

⁴⁸ For more information, see: <https://www.epa.gov/clean-air-act-overview/clean-air-act-title-i-air-pollution-prevention-and-control-parts-through-d#ia>.

Superfund and hazardous waste sites, as required by the CERCLA.⁴⁹ PPRTVs are typically developed for data poor chemicals for which no IRIS value exists.

Research to Advance Risk Assessment Methods: Develop tools and methods that support the scientific advances in assessments. This includes research to incorporate non-animal testing data into assessments. It also includes research on assessment methods for emerging contaminants such as perfluorinated compounds and biotechnologies.

The HHRA research program anticipates developing new assessment approaches by means of an expanded product line to enhance rapid response and screening capabilities and to augment toxicity value derivation procedures for health assessments.

Recent accomplishments in the HHRA research program include:

Recent accomplishments in the HHRA research program include the 2017 GAO High Risk report, which noted significant improvement in their high risk criteria ratings specific to the IRIS program.

Responsiveness in the Development of HHRA Deliverables

To support TSCA, a systematic review protocol as well as a draft document containing a preliminary hazard evaluation for hexabromocyclododecane (HBCD) was delivered to the Agency's Chemical Safety and Pollution Prevention program to support their risk evaluation. HBCD is one of the first ten chemicals designated to be evaluated under TSCA.

Final ***IRIS assessments*** for Ethylene Oxide, and Benzo(a)pyrene were completed; and draft IRIS assessments for Ethyl tert-Butyl Ether (ETBE), and tert-Butyl Alcohol (TBA) were released to the Science Advisory Board (SAB) for independent, external peer review.

ISA chapters were developed for two final Integrated Review Plans (IRPs): one to support the primary and secondary NAAQS review for particulate matter and another to support the secondary NAAQS review for oxides of nitrogen and sulfur. In addition, the final ISA for Oxides of Sulfur – Health Criteria to support the primary NAAQS for SO₂ was issued in December 2017.

HHRA continues to provide ongoing technical support for EPA's human health and ecological risk assessment program, delivered 12 high priority ***PPRTV assessments*** in FY 2017, and is planning to deliver a similar number by the end of FY 2018.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 3/Objective 3.3, Prioritize Robust Science in EPA's FY 2018 – 2022 Strategic Plan. The HHRA research program's work in FY 2019 will focus explicitly on efforts integral to achieving the Administrator's priorities and informing the Agency's implementation of key environmental regulations. Examples of this work include:

⁴⁹ See, 42 U.S.C. Sec. 9601 *et seq.*:

http://uscode.house.gov/view.xhtml?path=/prelim@title42/chapter103&edition=prelim#9601_5_target.

- **Support the Agency's Implementation of TSCA:** Provide scientific products and support required for TSCA implementation to the Agency's Chemical Safety and Pollution Prevention program. This will include support for risk evaluations of the first 10 TSCA chemicals (Designation of Ten Chemical Substances for Initial Risk Evaluations Under the Toxic Substances Control Act, 81 FR 91927), through to completion in FY 2019, as well as any additional chemicals identified for the pipeline of TSCA risk evaluations [TSCA section 6(b)(2)]. The program will continue its efforts to maintain and improve support of TSCA implementation.
- **Support the Agency's Implementation of the Safe Drinking Water Act:** Provide research and technical support to the Water program. Specifically, in support of the Safe Drinking Water and Clean Water Acts, HHRA will focus on evaluating health impacts from exposure to known and emerging, chemical and biological contaminants under the authorities of SDWA.
- **Support the Agency's Implementation of the Clean Air Act:**
 - Provide the scientific products and support to the Agency's Air and Radiation program to conduct Risk and Technology Reviews under Title III of the Clean Air Act.
 - Provide ISAs to support decisions to retain or revise the NAAQS for six criteria air pollutants as required every five years by the Clean Air Act. ISAs also inform analyses by state and local officials, including benefit-cost analyses, to support implementation of air quality management programs.
- **Targeted support for program and regional offices, and states and tribes:** Develop a portfolio of products that optimize the application of best available science and technology, with an increased focus on the specific decision needs. These more targeted assessments will promote greater throughput, and will be shaped for use by several partners, including the states, tribes, other federal agencies, and EPA's national and regional program offices.
- **Support Superfund:** Provide risk assessments, Provisional Peer-Reviewed Toxicity Values (PPRTVs), and advanced exposure assessment tools as well as provide technical support to help inform EPA's clean-up decisions at contaminated Superfund, Brownfields, and hazardous waste sites, as required by RCRA and CERCLA.
- **Human and Ecological Risk Assessments:** Provide localized technical assistance and scientific expertise on human and ecological risk assessments to states, tribes, regions and programs. This includes direct support in cases of emergencies and other rapid response situations.

In addition, the Agency is currently reviewing IRIS to ensure it supports the Agency's highest public health decision-making, and its role in supporting the TSCA program, while continuing to support all of EPA's programs. Examples of modifications to IRIS include:

- The implementation of systematic review to ensure risk assessments are complete, unbiased, reproducible and transparent; and

- Moving from traditional IRIS assessments to “fit-for-purpose” products to ensure risk assessments remains responsive to stakeholders/partners.

Performance Measure Targets:

(RA1) Percentage of planned research products completed on time by the Human Health Risk Assessment research program.	FY 2018 Target	FY 2019 Target
	100	100
(RA2) Percentage of planned research outputs delivered to clients and partners for use in informing human health decisions.	FY 2018 Target	FY 2019 Target
	100	100
(RD2) Number of peer-reviewed journal articles with datasets cleared for publication.	FY 2018 Target	FY 2019 Target
	336	336
(RD1) Number of Office of Research and Development (ORD) research products meeting customer needs.	FY 2018 Target	FY 2019 Target
	No Target Established	TBD
(RA8) Annual progress score for finalizing IRIS health assessments, Provisional Peer-Reviewed Toxicity Values, and Integrated Science Assessments.	FY 2018 Target	FY 2019 Target
	5	5

The table above reflects the HHRA research program’s annual performance measures. EPA uses these measures to assess our effectiveness in delivering needed products and outputs to clients (decision-makers, states, and local governments).

ORD’s state engagement program is designed to inform states about ORD’s research programs and role within EPA, and to enable ORD to better understand the science needs of state environmental agencies. Key partners at the state level include the Environmental Council of the States, with its Environmental Research Institute of the States and the Interstate Technology and Regulatory Council, the Association of State and Territorial Health Officials as well as state media associations such as the Association of State and Territorial Solid Waste Management Officials.

EPA has established a standing subcommittee under EPA’s Board of Scientific Counselors (BOSC) for the Chemical Safety for Sustainability and Human Health Risk Assessment National Research Programs that will be utilized to evaluate the HHRA program as part of its performance and provide feedback to the Agency. EPA will meet regularly with the BOSC for input on topics related to research program design, science quality, innovation, relevance and impact. This includes advising EPA on developing its strategic research direction and Strategic Research Action Plans for FY 2019-2022.

EPA collaborates with several science agencies and the research community to assess our research performance, such as the National Institutes of Health, the National Science Foundation, the

Department of Energy, and the United States Department of Agriculture. The Agency also will work with the White House's Office of Science and Technology Policy. EPA supports the interagency Science and Technology in America's Reinvestment—Measuring the Effect of Research on Innovation, Competitiveness and Science (STAR METRICS) effort. This interagency effort is helping EPA to more effectively measure the impact federal science investments have on society, the environment, and the economy.⁵⁰

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$937.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$13,907.0/ -65.5 FTE) This program change:
 - Significantly reduces the HHRA research program's ability to develop assessments to support Agency decisions, which will not only impact the number of FTEs, but also the composition of the multidisciplinary teams assembled to address the needs of complex Agency decisions.
 - Reduces the HHRA research program's ability to provide daily technical support to program and regional offices and states and tribes, including during emergencies and urgent circumstances.
- (-\$2,317.0/ -15.2 FTE) Resources are being rebalanced to the Superfund appropriation within this program for IRIS.

Statutory Authority:

CAA Amendments, 42 U.S.C. 7403 et seq. - Sections 103, 108, 109, and 112; CERCLA (Superfund, 1980) Section 209(a) of Public Law 99-499; CWA Title I, Sec. 101(a)(6) 33 U.S.C. 1254 – Sec 104 (a) and (c) and Sec. 105; ERDDA 33 U.S.C. 1251 – Section 2(a); FIFRA (7 U.S.C. s/s 136 et seq. (1996), as amended), Sec. 3(c)(2)(A); FQPA PL 104-170; SDWA (1996) 42 U.S.C. Section 300j-18; TSCA (Public Law 94-469): 15 U.S.C. s/s 2601 et seq. (1976), Sec. 4(b)(1)(B), Sec. 4(b)(2)(B).

⁵⁰ STAR METRICS: <https://www.starmetrics.nih.gov/>.

Water: Human Health Protection

Drinking Water Programs

Program Area: Water: Human Health Protection

Goal: Core Mission

Objective(s): Provide Clean and Safe Water

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$95,917.2	\$96,200.0	\$80,543.0	-\$15,657.0
<i>Science & Technology</i>	<i>\$3,517.0</i>	<i>\$3,495.0</i>	<i>\$3,595.0</i>	<i>\$100.0</i>
Total Budget Authority	\$99,434.2	\$99,695.0	\$84,138.0	-\$15,557.0
Total Workyears	505.3	522.7	443.3	-79.4

Program Project Description:

The Drinking Water Technical Support Center leads the collection of national occurrence data for unregulated contaminants in drinking water; develops and evaluates analytical methods that are used to monitor drinking water contaminants accurately and reliably; leads the national program under which laboratories are certified to conduct the analyses of water contaminants with designated analytical methods; and works with states and public water systems collaboratively to implement tools that help systems achieve performance and optimization practices that maximize technical capacity while reducing operational costs.

FY 2019 Activities and Performance Plan:

Work in this program directly supports Goal 1/Objective 1.2, Provide Clean and Safe Water in EPA's FY 2018 - 2022 Strategic Plan.

In FY 2019, EPA's Drinking Water Technical Support Center will continue to carry out the following activities:

- Lead the development, revision, evaluation, and approval of chemical and microbiological analytical methods for unregulated and regulated contaminants to assess and ensure protection of public health from contaminants in drinking water (e.g., toxins resulting from harmful algal blooms, and Polyfluoroalkyl Substances (PFAS)).
- Implement EPA's Drinking Water Laboratory Certification Program⁵¹, which sets direction for oversight of municipal and commercial laboratories that analyze drinking water samples. Conduct three regional program reviews during FY 2019 and deliver two certification officer training courses (for chemistry and microbiology) for state and regional representatives to ensure the quality of the analytical results.
- Partner with states and water systems to optimize their treatment technology under the drinking water Area Wide Optimization Program (AWOP)⁵². The AWOP is a highly successful technical/compliance assistance and training program that enhances the ability

⁵¹ <https://www.epa.gov/dwlabcert>.

⁵² <https://www.epa.gov/dwstandardsregulations/optimization-program-drinking-water-systems>.

of small systems to meet existing microbial, disinfectant, and disinfection byproduct standards, and also addresses distribution system integrity and water quality issues. During FY 2019, EPA expects to work with states and tribes to teach them how to identify performance limiting factors at public water systems, and develop and apply tailored tools to help these public water systems overcome operational challenges, achieve performance and optimization levels, and reduce health-based compliance challenges.

- Continue monitoring under the fourth Unregulated Contaminant Monitoring Rule (UCMR 4). The UCMR 4 was published in December 2016, and addresses collection of data on occurrence of 30 contaminants of interest (e.g., cyanotoxins, disinfection by-products (DBPs), pesticides) to assess the frequency and levels at which these contaminants are found in public water systems. The UCMR 4 is a federal direct implementation program coordinated by EPA, as directed by the Safe Drinking Water Act. The data collected are used by EPA as part of the Agency's determination of whether to establish health-based standards to protect public health. Monitoring activities for UCMR 4 will occur between FY 2018 and FY 2021. 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 data available to our state and tribal partners and to the general public.

Performance Measure Targets:

Work under this program supports performance results in Drinking Water Programs under the EPM appropriation.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (+\$291.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to adjustments in salary, essential workforce support, and benefit costs.
- (-\$191.0/ -2.1 FTE) This program change reflects a reduction to the Drinking Water Program and streamlining of activities.

Statutory Authority:

Safe Drinking Water Act (SDWA).

Congressional Priorities

Water Quality Research and Support Grants

Program Area: Congressional Priorities

Goal: Core Mission

Objective(s): Provide Clean and Safe Water

(Dollars in Thousands)

	FY 2017 Actuals	FY 2018 Annualized CR	FY 2019 Pres Budget	FY 2019 Pres Budget v. FY 2018 Annualized CR
Environmental Program & Management	\$12,688.0	\$12,614.0	\$0.0	-\$12,614.0
<i>Science & Technology</i>	<i>\$7,803.4</i>	<i>\$4,072.0</i>	<i>\$0.0</i>	<i>-\$4,072.0</i>
Total Budget Authority	\$20,491.4	\$16,686.0	\$0.0	-\$16,686.0

Program Project Description:

In FY 2017, Congress appropriated \$4.1 million in the Science and Technology appropriation to fund high priority water quality and water availability research. EPA was instructed to award grants on a competitive basis, independent of the Science to Achieve Results (STAR) program, and give priority to not-for-profit organizations that: conduct activities that are national in scope; can provide a twenty-five percent match, including in-kind contributions; and often partner with the Agency.

FY 2019 Activities and Performance Plan:

Resources and FTE have been eliminated for this program in FY 2019.

Performance Measure Targets:

Currently there are no performance measures specific to this program.

FY 2019 Change from FY 2018 Annualized Continuing Resolution (Dollars in Thousands):

- (-\$4,072.0) This funding change eliminates this program as part of the effort to limit federal investment in lower priority activities and to focus resources on core environmental work.

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.

