

**FY2023 and 2024
NATIONAL PROGRAM MANAGER GUIDANCE
MONITORING APPENDIX**

Introduction:

This monitoring appendix is intended to provide a summary of priorities in ambient air monitoring including associated quality assurance, laboratory support, and other activities necessary to implement and maintain ambient air monitoring programs by State, local, and Tribal (SLT) air agencies. These programs are either run directly by SLT's or are available as noted for agencies to buy into through national contracts utilizing grant funds as associated program support. Funding for these activities is carried out in part through eligible grantees utilizing §103 and §105 Clean Air Act grants. The listing of a program below indicates that grantees may use eligible grant funds to support that program consistent with an approved grant negotiated with the applicable EPA Regional Office. Priorities for ambient air monitoring, where applicable, are described acknowledging that there are many competing needs for resources to implement and maintain ambient air monitoring programs.

EPA and its partners at state, local, and tribal (SLT) agencies, manage and operate ambient air monitoring networks across the country with three primary objectives: to ensure the public has access to clean air by comparing data and implementation of the National Ambient Air Quality Standards (NAAQS) and other health indicators for toxics; to provide the public with timely reports and forecasts of the Air Quality Index, and to provide information to health and atmospheric scientists to better inform future reviews of and revisions to the NAAQS.

The statutory authority for EPA to set up and coordinate the nation's ambient air monitoring networks, including authority for grants, is provided by the Clean Air Act (CAA). EPA's strategic plan provides goals for the air program that through specified objectives. Each of these are summarized below:

Clean Air Act (CAA) – The CAA provides the statutory authority to implement the national ambient air monitoring program. While monitoring is mentioned and referenced in several areas (42 U.S.C. 7403, 7405, 7410, 7414, 7601, 7611, 7614, and 7619) there are two areas of the CAA most important to note:

- § 7619. Air quality monitoring - After notice and opportunity for public hearing, the Administrator shall promulgate regulations establishing an air quality monitoring system throughout the United States which—
 - utilizes uniform air quality monitoring criteria and methodology and measures such air quality according to a uniform air quality index,
 - provides for air quality monitoring stations in major urban areas and other appropriate areas throughout the United States to provide monitoring such as will supplement (but not duplicate) air quality monitoring carried out by the States required under any applicable implementation plan,
 - provides for daily analysis and reporting of air quality based upon such uniform air quality index, and

- provides for recordkeeping with respect to such monitoring data and for periodic analysis and reporting to the general public by the Administrator with respect to air quality based upon such data.
- § 7405. Grants for support of air pollution planning and control programs

EPA's Strategic Plan – FY 2022 – 2026 provides a roadmap for accomplishing the EPA's environmental priorities over the next four years. This latest version of the strategic plan deepens EPA's commitment to protecting human health and the environment for all people, with an emphasis on historically overburdened and underserved communities. The most closely tied objectives and goals to ambient air monitoring are described below. The full plan is available on the web at: <https://www.epa.gov/system/files/documents/2022-03/fy-2022-2026-epa-strategic-plan.pdf>

- Objective 4.1: Improve Air Quality and Reduce Localized Pollution and Health Impacts. Select key statements related to ambient air monitoring in the strategic plan include:
 - Page 50: “The Agency will continue to develop and make available the necessary technical data and tools to support air quality planning and environmental justice analyses. This includes critical information on emissions and ambient concentrations of air pollution, and associated data systems, such as AirNow, the Air Quality System, and the National Emissions Inventory.”
 - Page 51: “EPA will work with air agencies and local communities to prioritize engagement with low-income and marginalized communities that for decades have been overburdened with air pollution and other environmental hazards. EPA will undertake air monitoring and other assessment approaches to address these long-neglected air quality and public health problems.”
 - Page 51: “The Agency will work to assess the current state of the nation's monitoring network and pursue collaborative approaches to modernize the technologies, equipment, and network design used to measure air quality as well as enhance the quality and security of critical data collection, handling, and reporting from the network.”

In addition to the statutory authority in the CAA and EPA's Strategic Plan, The Government Accounting Office (GAO) recently conducted a study of the national ambient air monitoring system and issued a report: “Air Pollution: Opportunities to Better Sustain and Modernize the National Air Quality Monitoring System (GAO-21-38, Published: Nov 12, 2020. Publicly Released: Dec 07, 2020). This report identified a few key points and two recommendations:

Key points from GAO Report:

- The ambient air quality monitoring system is a national asset that provides standardized information for implementing the Clean Air Act and protecting public health.
- The Environmental Protection Agency (EPA) and state and local agencies cooperatively manage the system, with each playing different roles in design, operation, oversight, and funding.
- Monitoring system infrastructure is aging while annual EPA funding for state and local air quality management grants, which cover monitoring, has decreased by about 20 percent since 2004 after adjusting for inflation.

Recommendations – The GAO made two recommendations for EPA:

- (1) establish an asset management framework for the monitoring system that includes key characteristics, and
- (2) develop an air quality monitoring modernization plan that aligns with leading practices. This includes investigation in potential increases in or enhancements of monitoring associated with:
 - Local-scale, real-time air quality data;
 - Levels of air toxics in the air;
 - Persistent and complex pollution (e.g., wildfires);
 - Using low-cost sensor and satellite data.

Supplemental Funding for Ambient Air Monitoring:

There have been two recent federal legislative acts that have and will provide additional resources to the nation’s ambient air monitoring programs in addition to the implementation of annual STAG grant planning and implementation described below. On July 7, 2021, EPA announced that it is making \$50 million in one-time American Rescue Plan (ARP) funding available to improve ambient air quality monitoring for communities across the United States. Details of this work are described below. On August 16th, 2022 the Inflation reduction act was signed into law. This law includes many provisions connected to human health and the environment, including specifics on ambient air monitoring. Since the IRA was just signed into law, at this time, specific details of how and when new resources would impact ambient air monitoring have not been established. Over the coming months and years, as EPA works with stakeholders on putting the IRA funds to work for the American public, we will incorporate those details into future updates to this monitoring appendix, where appropriate.

Implementation of American Rescue Plan (ARP) for Ambient Air Monitoring.

ARP funds are being put to work by SLTs for direct awards and by community groups and SLTs for the competitive awards described below. EPA Regional offices are taking the lead on implementing enhanced regional capacity for short-term community monitoring by working closely with affected communities and where appropriate, SLTs for the areas of need. While these funds are one-time funds, monitoring agencies will need to assure that all appropriate network design, probe and siting criteria, quality assurance, and reporting of data are appropriately implemented. Any new NAAQS sites or the addition or update of monitoring methods is to be detailed in accordance with the requirements of §58.10 - Annual monitoring network plan and periodic network assessment. The three technical pieces of the ARP for ambient air monitoring are described below. More details can be found at:

<https://www.epa.gov/arp/enhanced-air-quality-monitoring-funding-under-arp>

- Direct Awards to Air Agencies for Continuous Monitoring of PM_{2.5} and Other Common Air Pollutants: EPA distributed \$22.5 million to state, Tribal and local air agencies for enhanced monitoring of PM_{2.5} and five other air pollutants regulated by the National Ambient Air Quality Standards under the Clean Air Act.

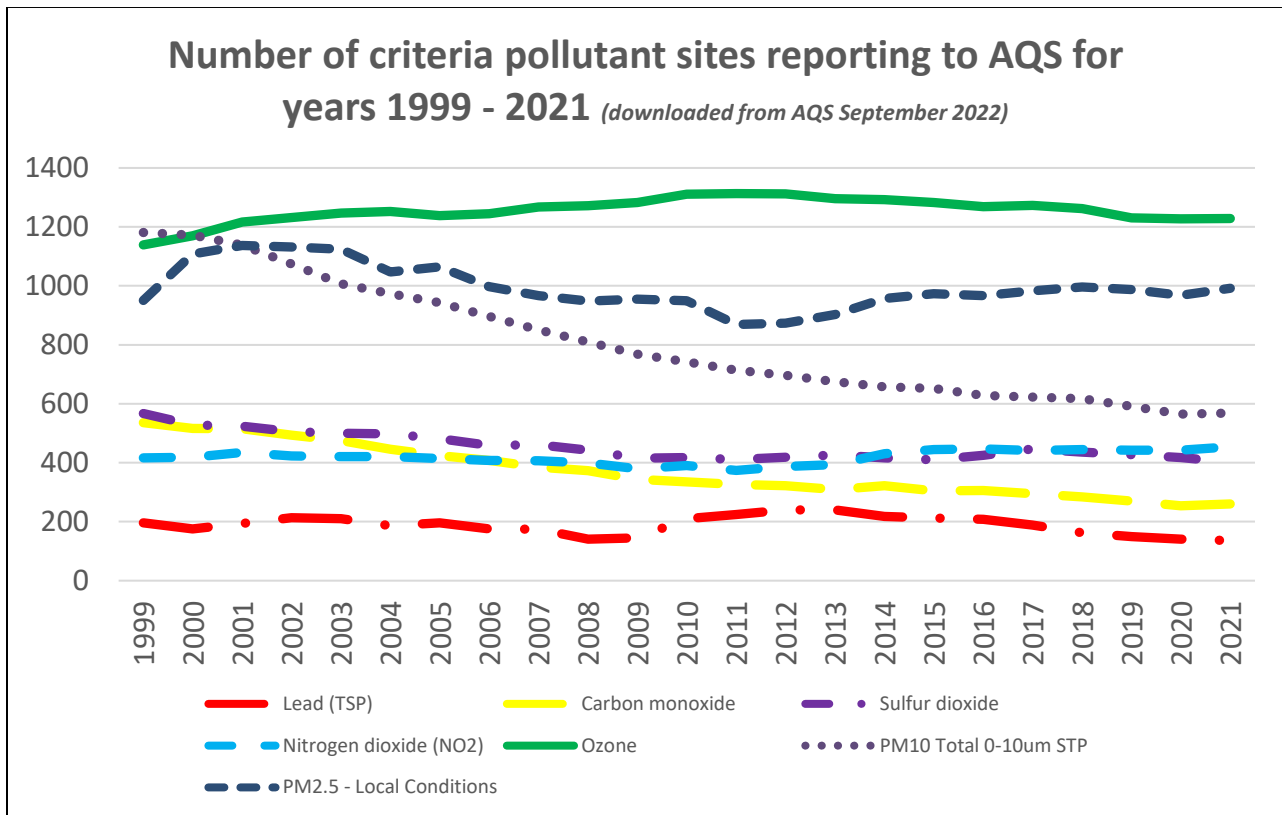
- **Grant Competition for Community Monitoring:** On December 13, 2021, EPA announced the availability of \$20 million in American Rescue Plan funding through competitive grants to enhance ambient air quality monitoring in and near underserved communities across the United States. EPA will award funds to support community and local efforts to monitor air quality and to promote air quality monitoring partnerships between communities and tribal, state, and local governments.
 - On November 3, 2022, [EPA announced the selection of 132 air monitoring projects in 37 states to receive \\$53.4 million in funding](#) (to enhance air quality monitoring in communities across the United States with environmental and health outcome disparities stemming from pollution and the COVID-19 pandemic. With monies made available through the American Rescue Plan of 2021 (ARP) and Inflation Reduction Act of 2022 (IRA), EPA is funding projects from community-based nonprofit organizations, state and local governments, and Tribal governments to conduct air monitoring in communities, particularly in communities that are underserved and historically marginalized.
 - The air pollution monitoring projects are made possible by more than \$30 million in Inflation Reduction Act funds, which supplemented \$20 million from the American Rescue Plan and enabled EPA to support 77 additional projects, more than twice the number of projects initially proposed by community-based nonprofit organizations, state and local governments, and Tribal governments.
- **Enhanced Regional Capacity for Short-term Community Monitoring Needs:** EPA is investing \$5 million in agency mobile monitoring labs or air sensor loan programs. These investments will improve EPA's ability to support communities in need of short-term monitoring and air quality information.

With EPA's authority to plan and implement ambient air monitoring programs, including use of grant funding; the EPA strategic plan, which provides a roadmap for prioritizing work over the next four years; as well as the GAO report which identified the network as a national asset and included two key recommendations; EPA and its partners in SLT programs have an overarching framework to operate and improve the nations ambient air monitoring programs. In the sections below, we will describe the details on each of the NAAQS, including the status of any NAAQS reviews and how it relates to ambient air monitoring, as well our plans for air toxics monitoring including long-term monitoring and special studies. We also describe our approach to inclusion of next generation technologies for use by SLTs. We invite input on an appropriate balance of putting grant resources to work across programs and methods to maximize the benefit to protecting human health and the environment.

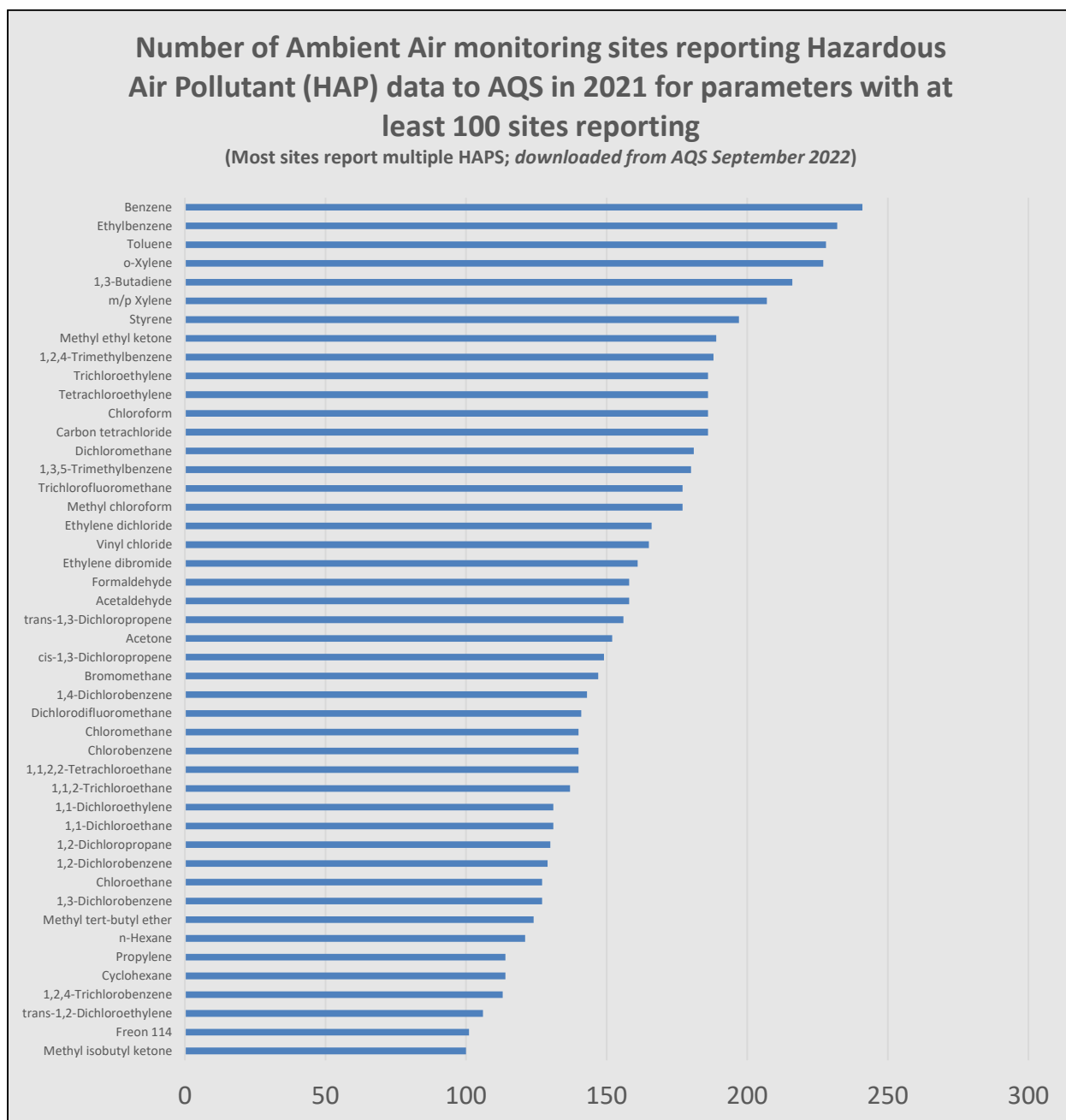
Implementation and Operation of Ambient Air Monitoring Programs

SLT monitoring agencies operate the overwhelming majority of nearly 5,000 criteria pollutant monitors across the country. These monitors are located at ~2,200 ambient air monitoring sites that may consist of one or more criteria pollutants and air toxics measurements with many sites also operating meteorological measurements. Criteria pollutant measurements and their supporting networks such as the photochemical air monitoring stations (PAMS), National Core (NCore) network, and the Chemical Speciation Network (CSN) are required by regulation (40 CFR Part 58). Figure 1 illustrates the number of NAAQS pollutant monitoring stations reporting

by parameter since 1999, which is the year the PM_{2.5} monitoring network began operation. Ozone and PM_{2.5} are the two most nationally robust networks as these two criteria pollutant measurements are associated with the NAAQS having the most areas near or above the level of the NAAQS. Networks for nitrogen dioxide (NO₂) and sulfur dioxide (SO₂) are generally stable with about 400 monitors for each pollutant. Criteria pollutant networks with a decreasing number of sites in recent years include PM₁₀, carbon monoxide (CO), and lead (Pb). These decreases in network size are consistent with lower measured concentrations for these pollutants allowing refocusing of resources to higher priority needs.



In the absence of any local or state requirements, SLT measurement of air toxics in the ambient air is voluntary. Therefore, EPA and SLTs work through optional Federal and SLT initiated programs to measure air toxics. These efforts include the National Air Toxics Trends Stations (NATTS) network and Urban Air Toxics Monitoring Program (UATMP) which provides access to laboratory analytical services, as well as other SLT led efforts. Non-routine work includes studies of air toxics in the ambient air such as those funded by special competitive grants enabling community scale air toxics monitoring. Figure 2 illustrates the number of sites reporting to EPA’s AQS data system for each Hazardous Air Pollutant (HAP) in 2021 for cases where there are at least 100 sites reporting for that HAP.



NAAQS reviews and changing priorities over the last several years have and may continue to result in changes to the monitoring networks. EPA requires that states perform network assessments every five years to determine, at a minimum, if networks meet the monitoring objectives defined in regulations, and whether new sites are needed, existing sites are no longer needed and can be terminated, and if new technologies are appropriate for incorporation into the ambient air monitoring network. Copies of the Network Assessments are available on the web at <https://www.epa.gov/amtic/state-monitoring-agency-annual-air-monitoring-plans-and-network-assessments>.

As part of EPA’s statutory requirement to review each NAAQS within a five-year period, EPA also reviews the associated ambient air monitoring network requirements and has previously

revised the NAAQS’ associated monitoring requirements for lead (Pb), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), particulate matter (PM_{2.5}) and ozone (O₃). Each of the NAAQS and any changes to the monitoring requirements are summarized in Table 1 below. With the large number of new and changing needs, many of which are highly technical, EPA remains committed to working closely with its State and local monitoring partners through forums such as the Monitoring Steering Committee of the NACAA and the Monitoring Committee of the AAPCA to ensure monitoring agencies and EPA are working together to improve the ambient air monitoring networks. EPA monitoring staff also work closely with tribal air monitoring agencies through participation in the Tribal Air Monitoring Support (TAMS) Center.

Table 1 has been provided to: assist agencies in understanding the status of each NAAQS review; identify important dates that affect monitoring implementation; and direct readers to where more detailed information can be found.

Table 1 – Summary of NAAQS and Ambient Air Monitoring Implementation Timeline

NAAQS	Date of Proposed or Final Rule, if available	Summary of Changes to Monitoring	Date Monitoring must be Operating by:	More information on final/proposed rule available at:
Lead - Monitoring	Final rule 11/17/2016	<ul style="list-style-type: none"> Current standard retained 	Not applicable (N/A)	https://www.epa.gov/naaqs/lead-pb-air-quality-standards
NO ₂ – Primary NAAQS and Monitoring	Final rule 4/6/2018	<ul style="list-style-type: none"> Current standard retained 	N/A	https://www.epa.gov/naaqs/nitrogen-dioxide-no2-primary-air-quality-standards
SO ₂ – Primary NAAQS and Monitoring	Final Rule 2/25/2019	<ul style="list-style-type: none"> Current standard retained 	N/A	https://www.epa.gov/so2-pollution/primary-national-ambient-air-quality-standard-naaqs-sulfur-dioxide
Ozone - Primary and Secondary NAAQS	Final rule December 31, 2020	<ul style="list-style-type: none"> Standard is currently being reconsidered 		https://www.govinfo.gov/content/pkg/FR-2020-12-31/pdf/2020-28871.pdf
SO ₂ and NO ₂ – Secondary NAAQS and Monitoring	Notice of Public Meeting	<ul style="list-style-type: none"> Review of ISA and secondary standards 		https://www.epa.gov/naaqs/nitrogen-dioxide-no2-and-sulfur-dioxide-so2-secondary-air-quality-standards
CO – Primary and Secondary NAAQS and Monitoring	Final Rule August 31, 2011	<ul style="list-style-type: none"> Primary standard retained, without revision 		https://www.epa.gov/naaqs/carbon-monoxide-co-air-quality-standards
PM – Primary and Secondary NAAQS and Monitoring	Proposed rule January 27, 2023	<p>Summary of monitoring changes included in reconsideration of PM NAAQS proposal include:</p> <ul style="list-style-type: none"> Updates in data calculations. Approval of reference and equivalent methods. Updates in quality assurance statistical calculations to account for lower concentration measurements. 		https://www.epa.gov/pm-pollution/national-ambient-air-quality-standards-naaqs-pm

		<ul style="list-style-type: none"> ○ Updates to support improvements in PM methods. ○ Update to PM_{2.5} network design criteria to account for at-risk populations; and ○ Updates to the Probe and Monitoring Path Siting Criteria for NAAQS pollutants. 	
--	--	--	--

This document provides guidance on the use of section 103 and 105 STAG resources for air toxics and criteria pollutant monitoring networks, as well as important associated networks such as the NCore, CSN, PAMS, and Interagency Monitoring of Protected Visual Environments (IMPROVE) networks. The document provides information on directions and priorities for ambient monitoring considering the emerging needs identified in various NAAQS reviews, the GAO report recommendations, and EPA’s strategic plan.

The EPA Ambient Air Monitoring Group (AAMG) maintains the Ambient Monitoring Technology Information Center (AMTIC) website which provides monitoring-related policy and technical guidance for all criteria pollutant and toxics pollutant monitoring networks. This website can be accessed at <https://www.epa.gov/amtic/>.

Highlights in Monitoring Funding for FY 2023 and FY 2024

In this section we highlight ambient air monitoring and quality assurance programs with any important notes or changes expected in FY2023 and FY 2024. Changes are largely the result of either evolving programmatic needs and priorities and/or changes in contractual costs of laboratory, shipping, and quality assurance support contracts. We also explain program changes that have occurred and are already implemented since our last NPM guidance monitoring appendix was issued for FY 2020. Finally, we provide notes on other changes to OAQPS Associated Program Support costs for remaining programs including any with changes as well as those that have remained stable.

Programs with Important Changes for FY2023 and FY2024

Community-Scale Air Toxics Ambient Monitoring (CSATAM) Grants:

EPA has already held back \$2.5M in FY2022 funds and plans to hold an additional \$2.5M each year for FY2023 and FY2024 for a total of \$7.5M. EPA intends to use these funds for a CSATAM grant competition to be announced and awarded in FY2024.

Reconsideration of the PM NAAQS

On June 10th, 2021, EPA announced that it would reconsider the decision to retain the particulate matter (PM) National Ambient Air Quality Standards (NAAQS), which were last strengthened in 2012. As part of this reconsideration, EPA staff have worked closely with NACAA, AAPCA, and Tribal air monitoring representatives and other stakeholders to identify options for improving the monitoring regulations. Several technical areas have been explored and are

intended to be addressed in the recently announced notice of proposed rulemaking for the PM NAAQS reconsideration. See Table 1 above.

To the extent the Administrator considers a more protective PM_{2.5} NAAQS, there would be limited monitoring impacts under regulatory requirements. For example, the design value and population of an area dictate the number of minimally required monitoring sites. A recent analysis which is included in the notice of proposed rulemaking for the reconsideration of the PM NAAQS found that depending on a final decision on the level of the PM_{2.5} NAAQS a few to several new sites may be necessary. Should new minimally required PM_{2.5} sites be necessary, EPA intends to identify grant funds off the top for the applicable monitoring agencies to implement these potentially newly required sites. This is consistent with EPA planning during the implementation of the near road network and changes to the PAMS network where funding for new sites and equipment were identified and included for distribution to applicable monitoring agencies. Based on the timeline for establishing any newly required sites in the notice of proposed rulemaking, funding would intend to be made available in FY2024.

Reconsideration of the Ozone NAAQS

On October 29, 2021, the EPA announced it would reconsider the 2020 final decision to retain the 2015 Ozone NAAQS, which was strengthened in 2015. A Clean Air Scientific Advisory Committee (CASAC) was reinstated to provide expertise and advice. EPA is targeting the end of 2023 to complete this reconsideration.

Contracts for the Chemical Speciation Network:

In 2022, EPA issued a request for proposal for a new Chemical Speciation Laboratory (CSN) support contract. At the time of writing this monitoring appendix a new contract has not yet been awarded. EPA anticipates increased costs, including shipping, for participating in this contract which supports Speciation Trends Network sites (STN), supplemental sites, and many NCore stations with chemical speciation laboratory support.

Shipping Costs for Laboratory and Quality Assurance programs

EPA shipping contracts with national carriers have cost escalators associated with higher fuel prices. Due to the increase in fuel costs coming off the COVID pandemic, shipping costs have risen substantially for all EPA programs where we are using a national carrier to ship. These additional costs are passed along in the form of higher contract costs for participating in the contracts. These additional higher fuel prices will be included in updated overall contract costs.

Implementation of additionally required Near-Road Sites

Consistent with previous funding strategies, EPA intends to set aside \$200k per site in §103 funds to support implementation of each newly required near-road monitoring station. For FY 2023, EPA expects two new sites to need funding for their implementation. One location is in Portland OR and the other in Tulsa OK. In FY 2024, EPA expects a new near road site may

need to be planned in Honolulu, HI. All three of these sites are expected due to population growth.

Implementation of additionally required PAMS stations

PAMS measurements are required at each NCore site in a CBSA with a population of 1,000,000 or more, based on the latest available census figures. There are two CBSA's without PAMS that meet the population threshold that will need to be planned and implemented since the applicable ozone design value for the CBSA is within 85% of the ozone NAAQS. These CBSA's include Tulsa, OK and Fresno, CA. EPA intends to set aside \$250k per suite of PAMS measurements in §105 funds to support implementation of each newly required PAMS collocated with NCore. Both newly required sites are due to population growth.

Pilot of GAO Recommendations

EPA is asking SLT monitoring agencies to participate in a pilot asset management framework exercise for their programs in FY2023. EPA shared examples of and took feedback on an asset management framework at the recent National Ambient Air Monitoring Conference in Pittsburgh – August 2022. EPA has released a written proposal for SLT feedback which was due near the end of November 2022. In these materials EPA explained how there are existing examples of asset management already successfully implemented by many monitoring agencies and how aligning these and any new asset management framework might include some basic consistent structure.

Programs with Important Notes or Changes in Recent Years:

National Air Toxics Trends Stations (NATTS)

In FY 2023 and FY 2024, EPA anticipates funding air toxics monitoring at existing National Air Toxics Trends Stations (NATTS) at FY 2022 levels. Historically, the NATTS had been funded at \$4.2M. However, due to rising contracts costs and the need for additional field work (e.g., modification of the NATTS workplan to include additional analysis of HAPs), EPA increased the allocation for NATTS to \$4,665,050 in FY 2022. EPA expects to fund the NATTS network with at least that amount in FY 2023 and FY 2024.

PM_{2.5} Monitoring Funds:

Per appropriation language since the beginning of the PM_{2.5} monitoring program, EPA intends to continue to make grants available under §103 of the Clean Air Act to support PM_{2.5} monitoring activities. Should this appropriation language change, EPA will revisit this issue.

Standard Reference Photometer (SRP)

EPA proposes to utilize \$116,400 from the national allocation to support the standard reference photometer (SRP) program. This is the same amount of funds that were utilized for this program in FY2022 but represents an increase from previous years when the program was funded at

\$55,000 per year. The additional funds utilized in the program are needed due to an increase in contract costs and equipment upgrades associated with this work. These resources will support verifications, maintenance, repair and updating of the Regional and Headquarters SRPs each year and the necessary shipping to accomplish these activities. We will hold back \$11,640 from each of the ten EPA Regional Offices §105 allocations to pay for these contract costs.

Changes to Protocol Gas Verification Program

State, local, and tribal agencies use the Ambient Air Protocol Gas Verification Program (AA-PGVP) to independently assay NIST traceable calibration gas standards obtained from commercial protocol gas producers. These independent assays are required by regulation and are performed to assure the quality of EPA Protocol Gases used to calibrate the continuous ambient air monitors used for NAAQS regulatory decision making. To support State and local requests to verify cylinders, EPA has reinvested and redesigned the AA-PGVP. In FY2021, \$200k of prior year funds were utilized for one-time equipment purchases to support the Regional Labs. Ongoing annual operation and maintenance began in FY2021 at \$250k per year. For FY2023 and FY2024, EPA intends to continue to fund this program at \$250k per year utilizing §105 funds held nationally. The majority of this increase is due to analytical work migrating from EPA FTEs to regionally directed contractor support with the remainder directed at national program support.

Changes to PAMS Equipment Holdback

In FY 2021, based upon feedback from applicable monitoring agencies, EPA determined all requested PAMS equipment had been purchased for the PAMS stations required at that time. Therefore, EPA returned over \$700k in remaining PAMS equipment funds to monitoring agencies.

Notes on other changes to OAQPS Associated Program Support costs:

Section 105 costs associated with Quality Assurance activities.

105 Funded Quality Assurance Cost - General Information

Each Regional office identifies the funding needed to support the operation of two of the national Performance Evaluation Program (NPEP) components, which are the National Performance Audit Program (NPAP) and the Pb Performance Evaluation Program (Pb PEP) for the monitoring organizations their respective regions. The costs for these programs vary each year depending on the number of sites to visit, location, and whether an agency self-implements or asks EPA to implement. Additionally, these costs vary due to negotiated contract costs, as well as shipping costs described above. Accordingly, these costs are updated to reflect the amount of work being implemented in each Region and to maintain/replace equipment used in these programs.

National Performance Audit Program (NPAP)

The level of funds for implementation of the National Performance Audit Program (NPAP) in FY 2023 is expected to be approximately \$1,070,000. In FY 2021, a cost increase of

approximately \$200,000 was incurred for NPAP due to the California Air Resource Board ceasing self-implementation of the NPAP. EPA Region 9 with their support contract transitioned the program back in FY 2020 and fully implemented it in FY 2021.

Lead Performance Evaluation Program (Pb PEP)

Costs have steadily decreased for the last few years for the Pb PEP due to a reduction in the Pb monitoring network overall. The level of funding for the Pb PEP to support the Pb monitoring network nationally is expected to be approximately \$150,000. These funds cover the regional implementation of the Pb PEP, associated analytical support, and national program support. However, the cost for the Pb strip QA program has remained static as the program still serves approximately the same number of analytical laboratories. The estimated annual cost for the Pb Strip QA program is \$48,000.

National Procurement Contracts

Consistent with previous years, Regions have passed along requests for buying into national contracts. These costs vary year to year depending on the needs requested by the monitoring agency and contract prices. Additionally, these costs vary due to shipping costs as described above. Examples of national contracts include filters, PAMS analysis, and air toxics analysis.

Notes on Programs where implementation is expected to remain relatively stable in FY2023 and FY 2024.

IMPROVE

Funding for the portion of the IMPROVE program that addresses progress in improving visibility in Class I will continue to be held nationally. This includes funding for the 110 IMPROVE stations needed to meet the regional haze rule requirements of states monitoring Class I areas for long-term trends through and beyond the 10-year SIP period (2008 to 2018). This is also useful in the periodic assessments of progress that are required in achieving the national visibility goal.

PM_{2.5} Performance Evaluation Program (PEP)

The level of funds for the nationally administered, independent Performance Evaluation Program (PEP) provided as associated program support for PM_{2.5} monitoring is expected to remain constant at approximately \$2.0 million. Monitoring agencies with an adequate level of independence between quality assurance and monitoring groups may conduct the PEP themselves. In these cases, monitoring agencies that conduct the PEP will receive the refundable portion of the EPA program costs that would otherwise have been used to pay for EPA regional lab contract staff.

PAMS Quality Assurance and Data Analysis and Reporting Tool (DART)

EPA proposes to continue to allocate \$500,000 for PAMS quality assurance activities as well as supporting tools such as the DART. EPA will further consult with state and local agencies on the use of the funds that would be prorated from each Region during FY 2023 and FY 2024.

National and regional scale assessments of the data quality of the SLAMS criteria pollutant data

EPA proposes to utilize \$30,000 from the national allocation to perform regional and national scale assessments of the data quality of the SLAMS criteria pollutant data. These assessments will build upon and enhance QA reports like the AMP256 and AMP600 and include additional QA information that will be provided through the QA transaction application. We plan on utilizing the AirData platform to develop assessment tools that can be used by the monitoring organizations to provide data reports and assessments. QA data will be loaded into the DATA Mart for use on the AirData platform and for subsequent report generation.

Operation and testing of on-site monitoring station

EPA proposes to utilize \$40,000 from the national allocation to maintain an operational on-site monitoring station in Research Triangle Park, NC for the evaluation of new ambient methods and data systems as well as to support hands-on training of monitoring agency site operators and EPA staff responsible for approving annual network monitoring plans, conducting TSA's, and overseeing quality assurance programs such as NPAP and PEP.

Ambient Air Monitoring and Quality Assurance Program Descriptions

Fine Particulate (PM_{2.5}) Monitoring Network

The PM_{2.5} monitoring network includes three major components: the network of filter-based FRM/FEMs used for comparison to the NAAQS; continuous FEM mass monitors used for both public reporting of the Air Quality Index and for comparison to the NAAQS; and speciation samplers operated as part of the Chemical Speciation Network (CSN) and IMPROVE program that are used to characterize the chemical composition that makes up fine particulate matter. The CSN includes the Speciation Trends Network and supplemental speciation sites. The primary objective of the IMPROVE program is to support the regional haze program.

In developing the PM_{2.5} monitoring allocation for FY2023, OAR will employ the same region-by-region funding approach used in prior years – i.e., utilization of a historical per month network operations cost. This cost is based on examining prior year grants and determining a cost per month for each grantee. For FY 2023, all PM_{2.5} monitoring grants are expected to cover the period from April 1, 2023, to March 31, 2024. For FY2024, EPA expects the grant period to cover April 1, 2024, to March 31, 2025. In some very limited cases monitoring agencies State or local budget cycles may necessitate using a grant period different than the expected periods described above. EPA Regional offices may grant such exceptions, where good cause can be shown, on a case-by-case basis.

In planning a PM_{2.5} monitoring network for FY 2023, each agency may use information from their five-year assessment submitted to EPA in 2020. Agencies should identify the appropriate changes to their networks in the annual monitoring network plan due by July 1, 2024. EPA does envision that state, local, and tribal agencies will continue to maintain a large robust network of PM_{2.5} monitors to support several monitoring objectives including protection of public health through the NAAQS.

As described above, ARP funds are being put to work by SLTs for direct awards which include specific investments in PM_{2.5} monitoring. These investments include updating methods operated at PM_{2.5} sites from FRM only to include a PM_{2.5} continuous FEM. While these funds are one-time funds, monitoring agencies will need to assure that all applicable network design, probe and siting criteria, quality assurance, and reporting of data are appropriately implemented. Any new NAAQS sites or the addition or update of monitoring methods is to be detailed in accordance with the requirements of §58.10 - Annual monitoring network plan and periodic network assessment.

In FY 2023 EPA is advocating continued operation of a robust monitoring network to continue support for the objectives stated above. For PM_{2.5} this means continued operation of high value FRM and speciation sites; PM_{2.5} continuous monitoring and associated data management systems for timely reporting of high-quality data; and precursor gas analyzers, data analyses and quality assurance activities that will support better understanding of particle formation. To the extent there are remaining needs to update PM_{2.5} continuous FEMs operating in individual networks, monitoring agencies may utilize grant funds, where available, to update already operating continuous FEMs at existing PM_{2.5} SLAMS sites. Selection of new PM_{2.5} continuous monitors should be limited to those FEMs with an acceptable level of comparability between the FEMs and collocated FRMs for the aerosol typically measured in the area of interest. Technical direction on implementing and reporting data from continuous [PM_{2.5} FEM and FRM monitors is available on EPA's AMTIC web site.](#)

To provide a clearer understanding of the expected outcomes of the ambient air monitoring objectives, the following goals for the fine particulate monitoring network have been developed:

- Appropriate spatial characterization of PM_{2.5} NAAQS;
- Public Reporting of PM_{2.5} in the AQI;
- Characterization of PM_{2.5} chemical speciation data for long term trends, development and accountability of emission control programs, tracking of regional haze, and for use in health studies;
- Operation of NCore trace-level CO, SO₂, NO/NO_y and PM (PM_{2.5} and PM_{10-2.5}) monitoring to support characterization of PM precursors;
- Characterization of near-road PM_{2.5} levels to evaluate exposure and determine gradients when compared with sites such as NCore;
- Assessment of PM_{2.5} data quality;
- Procurement and testing of PM_{2.5} filters.

Chemical speciation data from the Speciation Trends Network, IMPROVE, and the remaining supplemental speciation sites will continue to be utilized to track progress over time as the national and local control programs are implemented. There are some areas that are expected to be in residual nonattainment for PM_{2.5} even after the national control strategies are implemented or that may be designated nonattainment with a potentially revised annual PM_{2.5} NAAQS. As in previous years, monitoring organizations will again be asked to determine whether they plan on implementing the PM_{2.5}, PEP, NPAP, and/or Pb-PEP or allow for continued Federal implementation of these programs. Monitoring organizations must meet the minimum requirements of adequate and independent to implement the PEP for either pollutant. OAQPS has provided guidance to regional offices on how to assess adequacy and independence of

proposed audit programs. Information on this decision process is provided in a memorandum from the EPA regional office to the monitoring organizations each year to make decisions that will affect the next calendar years audit activities. An FY 2023 guidance memorandum covering details on participation in the PM_{2.5} PEP was issued to the EPA Regional offices in August 2022¹.

Monitoring agencies may benefit by maintaining an in-house inventory of portable low-cost PM sensors to support and supplement their existing FRM/FEM network on an as needed basis. These sensors generally have the ability to be deployed more readily than traditional FRMs and FEMs to support monitoring objectives such as evaluating their network design, source identification and characterization, and temporary monitoring during air pollution events such as wildfires. While PM sensors have several useful applications, there are not any currently approved low-cost devices as FRMs and FEMs and as such sensors should only be used to supplement regulatory measurements. Decisions on which portable low-cost PM sensors to pursue should be informed by available independent testing such as the EPA Office of Research and Development's "Air Sensor Toolbox - Evaluation of Emerging Air Pollution Sensor Performance" (<https://www.epa.gov/air-sensor-toolbox/evaluation-emerging-air-pollution-sensor-performance>) or similar. As such monitoring agencies may utilize a portion of their existing PM section 103 grants to purchase portable low-cost PM sensors.

Gas monitoring at NCore with high sensitivity measurements of CO, SO₂, and NO/NO_y will continue as part of the multi-pollutant strategy to support characterization of PM and ozone precursors in FY 2023 and FY 2024. This equipment should include appropriate calibration and auditing equipment to provide calibration points and audit points at lower concentrations ranges as required by the monitors detection limits. Replacing aging NCore monitors and equipment near the end of their useful lifetime is also an appropriate use of funds.

Monitoring agencies may also find it useful to use a portion of their direct awards to implement additional meteorology equipment that supports forecasting of the AQI. Of specific interest may be recently commercialized, high quality, and lower priced instruments that characterize the vertical thermal structure of the boundary layer.

In FY 2023 and FY 2024, PM_{2.5} monitoring grant funds allocated to states can be directed towards improvements in data management systems to support timely reporting of high-quality data from PM continuous mass monitors, PM continuous speciation monitors, and precursor gas monitors. Of specific note is the need to transition PM_{2.5} continuous FEM monitors from analog to digital data systems so that important diagnostic data (e.g., sample flow rates, operational relative humidity, or temperature...) is readily available for validation of data used in NAAQS decisions. Resources dedicated to this area will support processing, validating, and reporting of data that supports the PM monitoring program. Replacing aging PM samplers, monitors, laboratory and supporting equipment near the end of their useful lifetime is also an appropriate use of funds.

¹ National Performance Audit Program, PM_{2.5}, PM_{10-2.5}, and Lead Performance Evaluation Program Implementation Decision Memorandum for Calendar Year 2023: https://www.epa.gov/system/files/documents/2022-10/NPAP-PEP_Impl_2023_FINAL_081522.pdf.

In 2024, EPA expects to host a comprehensive National Ambient Air Monitoring Conference. This conference was last held in August 2022 (<https://www.epa.gov/amtic/amtic-training-conferences-and-supporting-information>) and is planned to be held every other year. EPA and state, tribal, and local agencies both benefit from this conference. It is lauded as the premier opportunity for training, exchange of technical information, networking between monitoring agencies, EPA and air monitoring instrument vendors. Grant funds can be used to support SLT participation in this conference.

Distribution of Funds

The FY 2023 and FY 2024 Ambient Monitoring appendix does not include a final allocation of monitoring funds among regional offices for use in direct awards. As in previous years, EPA will be consulting further with stakeholders on this topic once we have more detailed information on the funding for FY2023 and FY 2024.

A final allocation will include tables that will provide more detailed information on the region-by-region allocation including cost estimates for associated program support. Cost estimates will assume that monitoring organizations will not reduce their networks (and the services/ materials needed to support them) in 2023 and 2024 compared to previous years. The estimates should help inform how the program costs may change this coming year and are subject to change based on monitoring organizations' actual plans for the numbers of sites that will need these services in FY 2023 and FY 2024.²

Monitoring Networks for Other NAAQS Pollutants

Support of Established NAAQS Networks

EPA will continue to work closely with affected air monitoring programs on deploying new or revised monitoring networks, where necessary. This section summarizes both the new monitoring that will need to be implemented during FY 2023 and FY 2024 date as well as new operations and maintenance for monitoring that needs to be operational during FY 2023 and FY 2024 for NAAQS. These areas are traditionally funded using section 105 authority and include: ozone (O₃), lead (Pb), carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), PM₁₀, and PM_{10-2.5}.³ Additional information on each network is summarized below

FY 2023 and FY 2024 STAG grant funds should be utilized for on-going ambient monitoring programs to support:

² State and local agencies have costs associated with many activities within each monitoring program area. Not all types of operating expenses may be accounted for. Some of these costs are well understood such as capital infrastructure, salaries of staff and management working on the program, and costs of expendable items used in the program. Less obvious, but important to include in planning operation of a network, are costs of participating in conferences and workshops that support training and building further expertise in agencies operating the network.

³ On October 17, 2006 EPA revoked the annual PM₁₀ NAAQS everywhere. 71 FR 61144. The 24-hour PM₁₀ NAAQS was retained everywhere. No NAAQS was established for PM_{10-2.5}. On the same day, EPA also promulgated a Federal Reference Method for PM_{10-2.5} and certain monitoring requirements for PM_{10-2.5} as part of the new NCore network with an implementation date of January 1, 2011. 71 FR 61236.

- National and local spatial characterization of ozone (O₃) relative to the NAAQS;
- National and local public reporting of O₃ in the AQI;
- Local public reporting of CO, SO₂, NO₂, and PM₁₀ in the AQI for areas where these pollutants are of concern;
- Operation and maintenance of NCore stations beyond the leveraged funds provided under the PM_{2.5} monitoring program;
- Operation and maintenance of Near Road stations;
- Local characterization of the CO, SO₂, NO₂, and PM₁₀ NAAQS in the few areas with NAAQS non-attainment and any maintenance issues;
- In addition to the monitoring provided for above, limited characterization of O₃, CO, SO₂, NO₂, Pb, and PM₁₀ data in all other areas for long term trends, support for long-term health and scientific assessments, and development and accountability of emission control programs as part of a multi-pollutant approach to air quality management;
- Assessment of O₃, CO, SO₂, NO₂, Pb, and PM₁₀ data quality;
- Analysis and interpretation of the O₃, PAMS, CO, SO₂, NO₂, Pb, and PM₁₀ monitoring data and development of data assessment tools;
- Independent and adequate assessment of these pollutants' data quality, which is required in 40 CFR Part 58. This assessment is based on audit data generated under the National Performance Evaluation Program (NPAP, PM_{2.5} PEP, Pb PEP). State and local agencies will choose either to obtain audit services through EPA-managed contracts funded with grant funds, or may operate equivalent state-managed programs using independent staff, equipment, and standards. In some regions, EPA staff may perform or assist in audits with no charge to STAG funds, depending on staff and travel funds availability.
- Verification of monitoring organizations gas standards through participation in the Ambient Air Protocol Gas Verification Program
- Verification of monitoring organization ozone transfer standards through the Standard Reference Photometer (SRP) Program
- Reporting and certification of ambient air monitoring data required⁴ to be submitted to the Air Quality System (AQS) database.

Quality Assurance

As outlined in 2 CFR § 1500.11, all organizations conducting environmental programs funded by EPA are required to establish and implement a quality system. EPA requires a Quality Management Plan (QMP) to document how an organization structures its quality system and describe its quality policies and procedures, criteria for and areas of application, and roles, responsibilities, and authorities. The QMP also describes an organization's policies and procedures for implementing and assessing the effectiveness of the quality system. Specifications for Quality Management Plans for organizations that receive funding from EPA can be found in [EPA Requirements for Quality Management Plans \(QA/R-2\)](#). For more information and resources, see [Tools - Quality Management Plans](#).

EPA also requires that all environmental data used in decision making be supported by an approved Quality Assurance Project Plan (QAPP). The QAPP integrates all technical and quality

⁴ §58.15 – Annual air monitoring data certification, and §58.16 – Data submittal and archiving requirements.

aspects of a project, including planning, implementation, and assessment. The purpose of the QA Project Plan is to document planning results for environmental data operations and to provide a project-specific “blueprint” for obtaining the type and quality of environmental data needed for a specific decision or use. The QA Project Plan documents how quality assurance (QA) and quality control (QC) are applied to an environmental data operation to assure that the results obtained are of the type and quality needed and expected. An EPA approved QAPP is required before beginning data collection activities as defined in the QAPP requirements document. Specifications for QA Project Plans prepared for activities conducted by or funded by EPA can be found in [EPA Requirements for QA Project Plans \(QA/R-5\)](#). For more information and resources, see [Tools - QA Project Plans](#).

Both requirements are defined in EPA Order 5360.1 A2 (EPA 2000), Policy and Program Requirements for the Mandatory Agency-wide Quality System, for EPA organizations. Non-EPA organizations funded by EPA are required to develop a QMP and QAPP through:

- 48 CFR 46, for contractors;
- 40 CFR 30, 31, and 35 for assistance agreement recipients; and
- other mechanisms, such as consent agreements in enforcement actions.

Ambient Air Performance Evaluation Programs

A performance evaluation is a type of audit where quantitative data is collected independently to evaluate the proficiency of an analyst, laboratory, or some or all the component parts of a data collection activity. EPA implements many performance evaluation programs on behalf of the monitoring agencies. Two federally implemented performance evaluation efforts include the National Performance Audit Program (NPAP) for the gaseous pollutants and the national Performance Evaluation Programs for PM_{2.5} and Pb.

National Performance Audit Program (NPAP)

The NPAP is a cooperative effort among OAQPS, the EPA Regional offices, the monitoring organizations that operate EPA-funded air pollution monitors, and the other organizations that operate air monitors, for example at PSD sites. The implementation goals of the NPAP are to audit approximately 20 percent of the regulatory and compliance monitoring sites in the Ambient Air Quality Monitoring Network each year and to audit all monitoring sites within 6 years.

Although it is a goal to visit every monitoring site generating data that has significance to the air quality program within a 6-year period, among these sites there is an emphasis on auditing higher priority monitors (e.g., sites prioritized for health risk reasons) more frequently. In 2023 and 2024, the requirement for adequate independent audits applies to all monitors providing data for NAAQS comparison or compliance purposes. The NPAP program uses a through-the-probe (TTP) audit system, where appropriate for the monitoring situation given a site’s physical layout. This system has the advantage of testing the performance of the entire monitoring sampling train including inlets and manifolds. It also provides station operators immediate feedback on the audit results.

Each year, monitoring organizations are asked whether they plan on implementing the NPAP or would prefer continued Federal implementation of this program using STAG funds. See details in [The National Performance Audit Program, PM2.5, PM10-2.5, and Lead Performance Evaluation Program Implementation Decision Memorandum for Calendar Year 2023](#). Any non-EPA audits arranged by monitoring organizations must meet the minimum requirements of being adequate and independent. Under this approach EPA reserves a portion of appropriated STAG funds to cover Federal implementation of the NPAP, based on the number of geographically separate monitoring sites (not the number of distinct monitors) within each EPA Region.

The initial reserve of FY 2023 funds is estimated to be approximately \$1,070,000. This is based on EPA's current understanding of monitoring organizations' intentions for how NPAP audits will be implemented in 2023. If the number of sites in a Region to be audited by EPA staff or EPA-managed contractors is reduced because more monitoring organizations plan on implementing a program of adequate and independent NPAP audits without reliance on EPA contractors, and those organizations are assessed by the EPA regions as capable to perform the NPAP, a corresponding amount of STAG funds will be made available to the regional office for allocation as direct awards. The amount of funds held by EPA to perform the NPAP includes both a fixed cost associated with programs tools and equipment such as standard operating procedures and hardware and variable costs such as the operator time and travel costs associated with the number of audits conducted. Each year there is a cutoff – typically in September – for monitoring agencies to notify EPA if they intend to self-implement. Notification by September each year, provides a minimum amount of time for EPA to make necessary contracting and other arrangements for the audits it will manage in the next calendar year.

PM_{2.5} Performance Evaluation Program (PM_{2.5}-PEP)

The PM_{2.5}-PEP is a Regionally implemented audit program that collocates an independent PM_{2.5} FRM sampler at selected SLT PM_{2.5} monitoring sites in every primary quality assurance organization (PQAO)⁵.

- PQAOs with ≤ 5 sites require 5 audits
- PQAOs with > 5 sites require 8 audits

Samples are acquired over the four meteorological seasons; however, extremely low seasonal concentrations in some areas of the country are forcing EPA to concentrate the required PEP audits into 3 or even 2 seasons. PM_{2.5}-PEP samplers are sited within 1-2 meters of the target primary sampler at the host agency's monitoring site. Twenty-four-hour integrated filter samplers are acquired and send to an independent gravimetric laboratory staffed by an EPA contractor. The results are loaded into AQS and used for calculating bias for data certifications

⁵ Primary Quality Assurance Organizations are convenient groupings of State, local and/or Tribal monitoring agencies that operate under a common Quality Assurance Project Plan and aggregate their quality assurance data for assessing uncertainty of the routine network data that is generated in their geographic region. This construct was promulgated (2006) to allow very small monitoring organizations to reduce the number of QA measurements in their network compared to the number required under pre-2006 regulations. EPA determined through an analysis of the historic QA data that the number for larger organizations could also be reduced to the frequencies stated herein, and still provide enough statistical power to assess precision and bias of the network.

Lead Performance Evaluation Program (Pb-PEP)

The Pb PEP program is a mix of one or two PM_{2.5} PEP-like audits with additional collocated sampling. The program requires the same number of audit samples as required for PM_{2.5} meaning:

- PQAOs with ≤ 5 sites require 5 audits (1 PEP, 4 collocated)
- PQAOs with > 5 sites require 8 audits (2 PEP, 6 collocated)

The Pb-PEP audits consist of the implementation of a separate portable TSP Pb audit sampler that is placed within 2-4 meters of the routine Pb sampler. The sampler is operated by an independent auditor and the sample is shipped to an independent Pb-PEP laboratory for analysis. For the collocated samples, each quarter the monitoring organization field operator will take one additional collocated sample and send this sample to the independent Pb-PEP laboratory for analysis.

Like the PM_{2.5} PEP and the NPAP, implementation decisions for Pb-PEP are made by the monitoring organizations on an annual basis. EPA issues through the EPA Regional oversight programs, a memo to the monitoring organizations to determine whether they plan to self-implement the Pb-PEP or utilize the federally implemented program using STAG funds. Any non-EPA audits arranged by monitoring organizations must meet the minimum requirements of being adequate and independent. The definition for adequate and independent for Pb-PEP is very similar to PM_{2.5} PEP and the requirements can be found in the July 2019 memo which can be found at: <https://www.epa.gov/amtic/lead-performance-evaluation-program-pb-pep>. The EPA regions will collect this information from the monitoring organizations and provide the information to OAQPS in time to redirect the appropriate STAG funds for the federally implemented programs.

Under this approach EPA reserves a portion of appropriated STAG funds to cover potential Federal implementation of the Pb-PEP, based on the number of monitoring sites (not the number of distinct monitors) within each PQAO within a Region.

The amount of funds that would be reserved by EPA to perform the Pb-PEP includes both a fixed cost associated with programs tools and equipment such as standard operating procedures and hardware and consumables and variable costs such as the operator time and travel costs associated with the number of audits conducted. For FY 2023 and FY 2024, EPA proposes to allocate \$150,000 each year to perform the Pb-PEP program.

Ambient Air Protocol Gas Verification Program (AA-PGVP)

The AA-PGVP is a cooperative effort among OAQPS, EPA Regions 4 and 7, the monitoring organizations that operate CO, NO₂, and SO₂ monitors for NAAQS compliance monitoring, and auditing organizations performing independent audits to support these air monitoring networks. The implementation goal of the AA-PGVP oversight program is to provide reasonable assurance to EPA and the monitoring organizations that the calibration gases used for continuous ambient monitors in the national air monitoring network are accurate. To achieve this goal, EPA strives to obtain through submissions from monitoring organizations a gas standard from each specialty

gas producer each year and perform additional verifications of standards from specialty gas producers that have larger market shares.

The verification results allow EPA to assess the quality of the EPA Protocol Gas standards used in the NAAQS monitoring networks. These verification results also allow monitoring organizations access to independent assessments to use to inform their decisions on selecting specialty gas producers for these EPA Protocol Gas calibration standards. As explained above, annual costs for the program are now at \$250,000. In FY 2023 and FY 2024, EPA plans to utilize \$25,000 each year from each Region's STAG allocation to continue implementation and operation of the program.

Standard Reference Photometer (SRP) Program

In ambient air monitoring applications, precise ozone concentrations called standards are required for the calibration of ozone analyzers. Gaseous ozone standards cannot be stored for any practical length of time due to the reactivity and instability of the gas. Therefore, ozone concentrations must be generated and "verified" on site. When a monitor to be calibrated is located at a remote monitoring site, it is necessary to use a transfer standard that is traceable to a more authoritative standard. Traceability is the "property of a measurement result whereby the result can be related to a stated reference through a documented unbroken chain of calibrations, each contributing to the measurement uncertainty" (ISO). Since the 1980's EPA has implemented the SRP Program which provides a mechanism to establish the traceability of the nation's ambient air monitoring standards to the International Bureau of Weights and Measures and to the National Institute of Standards and Technology.

EPA proposes to utilize \$116,400 from the national allocation to support the standard reference photometer (SRP) program. This is an increase from previous years due to an increase in contract costs and needed upgrades associated with this work. These resources will support the verifications, maintenance, repair and updating of the Regional and Headquarters SRPs each year and the necessary shipping to accomplish these activities. EPA will hold back \$11,640 from each of the ten EPA Regional Offices §105 allocations to pay for these contract costs.

Photochemical Assessment Monitoring System (PAMS)

Required by section 182(c)(1) of the Clean Air Act, the PAMS program collects ambient air measurements of ozone precursors for a target list of volatile organic compounds (VOCs), NO_x, NO_y, and ozone, as well as surface and upper air meteorological measurements.

Changes to the PAMS network were included in the NAAQS for Ozone finalized in October 2015. The revised network includes an updated 2-part network design requiring PAMS measurements to be collocated with existing NCore sites in areas with population of 1 million or more irrespective of Ozone NAAQS attainment status (this results in a stable network of approximately 43 required sites) and requires states with moderate or above ozone non-attainment areas and states in the Ozone Transport Region to develop and implement an Enhanced Monitoring Plan (EMP). The EMPs will provide support for flexible approaches for collecting data to better understand ozone issues in new and existing high ozone areas. In Spring 2019 EPA issued a proposed regulation delaying the implementation date for the revised PAMS

network to June 2021 to allow state and local monitoring agencies necessary time to establish and install their required sites.

For FY 2023 and FY 2024, funding to support the revised regional PAMS requirements will be included in the overall allocation of section 105 ozone grant funding. Historically, \$14 million has been allocated to support the PAMS program. Of this amount, EPA recommends \$7.1 million be allocated to the required PAMS sites at NCore (\$166,000 per site), with the remaining funds used to support EMPs and other monitoring objectives.

For FY 2023 and FY 2024, EPA proposes to allocate \$500,000 each year for quality assurance and data analysis support for the PAMS program. EPA will further consult with state and local agencies on the use of the funds that would be prorated from each PAMS Region for follow-up data assessment and new data analysis and quality assurance work.

FY 2023 and FY 2024 PAMS Activities for State and Local Agencies

The allocated PAMS funds should be used to meet the following objectives:

(1) Continue System Implementation

- Continue work to procure, install, and become familiar with equipment necessary to make the required PAMS measurements at each required PAMS site. New required PAMS monitoring sites were to have begun operation by June 1, 2021.
- Reduce number of monitoring sites and monitoring at non-required sites based on new network design requirements.
- Operate operational PAMS sites (including existing and new sites), during the PAMS season June through August once equipment is properly installed.
- Develop and conduct area specific ozone precursor studies based on area specific needs as part of enhanced monitoring plans (EMPs).
- Continue making surface measurements of wind direction, wind speed, temperature, and humidity at all PAMS sites and additional measurements of solar radiation, ultraviolet radiation, pressure, and precipitation at one site in each PAMS area.
- For PAMS sites collocated with NCore multi-pollutant precursor gas sites, the meteorological monitoring data for ambient temperature, wind speed, wind direction, relative humidity, barometric pressure, and solar radiation are to be submitted to the AirNow program.

(2) Data Analysis

- Use PAMS data to develop and optimize control strategies in State Implementation Plan for ozone.
- Develop trends in ozone precursors, based on PAMS data that may serve to corroborate “rate-of-progress” and accountability demonstrations.
- Use PAMS data to corroborate ozone precursor emissions inventories and to address transport concerns.

(3) Data Reporting

- All PAMS data, including meteorological data, shall be submitted into AQS

- consistent with 40 CFR Part 58.
- All PAMS data shall be identified in EPA's Air Quality System (AQS) as monitor type 'PAMS'.
- Adequate procedures must be developed and followed to ensure proper validation of data prior to submission to AQS.

(4) Quality Assurance

- All sites must have and operate according to a Quality Assurance Project Plan (QAPP) developed by the monitoring agency and approved by an EPA regional office. The EPA has developed a model QAPP that may be used by monitoring agencies in developing their program specific QAPP.
- Ensure that Technical System Audits (TSA) are conducted at each host monitoring agency PAMS station at least every three years.
- Ensure the verification of PAMS calibration and retention time cylinders (funds will be held as associated program support based on the number of cylinders to be ordered via the national contract).

Air Toxics Monitoring

Funds are awarded under §105 authority to continue support for ongoing air toxics monitoring activities initiated and conducted by state and local air quality agencies. In addition, CAA §103 funds are allocated for the support of continued operation and maintenance of the NATTS Network. Funding for NATTS is again being requested using §103 authority which enables 100% federal funding. Also, funds are being reserved for a community-scale air toxics monitoring grants competition in FY2024.

Included in the NATTS program total are four supplemental program components: quality assurance, methods and instrumentation development, sample and equipment shipping and handling, and data analyses using all available ambient air quality data for toxics with special emphasis on observations from the NATTS and community-scale monitoring programs. These four components are associated program support for all grants that support air toxics monitoring or management activities. The desired program objectives are:

- Establish trends and evaluate the effectiveness of air toxics emissions reduction strategies.
- Characterize local-scale ambient concentrations that result when air toxics originating from local sources concentrate in relatively small geographical areas, producing the greatest risks to human health.
- Provide data to support, evaluate, and improve emission inventories and air quality models used to develop emission control strategies, perform exposure assessments, and assess program effectiveness.
- Provide data to support scientific studies to better understand the relationship between ambient air toxics concentrations, human exposure, and health effects from these exposures.

Changes in the last few years for NATTS include the addition of two new sites bringing the

network total to 26 stations. In addition, due to evolving priorities for HAPS with the most risk, EPA and participating agencies have added ethylene oxide (EtO) as part of their volatile organic compound (VOC) analysis and reporting. In FY 2023 and FY 2024, EPA proposes that \$4,665,050 in §103 STAG funds be used to fund operation of the NATTS Network each year. The monitoring grant periods for the NATTS network participants are from July 1, 2023 – June 30, 2024, for FY 2023 and July 1, 2024 – June 30, 2025, for FY 2024. About \$0.8 million is proposed to be used for quality assurance, data analysis, sample and equipment shipping and handling, and methods and instrumentation associated with the NATTS program.

The NATTS program component will continue to build on the established quality assurance and methods protocols. Laboratory and field staff will continue to work with EPA to ascertain the optimum methods for capturing and analyzing core pollutants associated with risk, develop performance-based quality indicators to prove valid data results that will contribute to our understanding of risks, and stabilize the measurements for all NATTS sites so that comparisons across the nation can be made. The analytical community will continue to assess trends in air toxics concentration levels, relate those data to associated risk levels, and explore relationships between these ambient and risk levels to emission sources and changes in these levels to emission reduction efforts.

The community scale projects are intended to better characterize air toxics problems at the local level, particularly for disproportionately affected areas, and to address those problems through local actions which complement national regulatory requirements. Such monitoring has the potential to define the scope of local air toxic problems, measure what reductions have been achieved through actions taken, and provide information needed for local policy development on reducing emissions from particular sources.

While aimed at meeting local data needs, EPA expects that data, results, and findings from all community-scale projects will also be valuable to other areas and to the national air toxics programs. Hence, a portion of the air toxics STAG funds are used to organize, summarize, and analyze the air toxics data from the community-scale studies and the NATTS sites (and data from other monitoring efforts) and to communicate the findings to all states involved in air toxics management.

IMPROVE Visibility Monitoring Network

The IMPROVE monitoring program supports the national goal of reducing haze to near natural levels in National Parks and wilderness areas. IMPROVE monitoring sites collect data on visibility, including optical, photographic, and speciated particulate data, though EPA resources are only used for particulate speciation monitoring. Data from IMPROVE sites are needed to meet the regional haze rule requirements of states for monitoring Class I area long-term trends, as well as being useful in the required periodic assessments of progress towards the national visibility goal. States also use data from the IMPROVE network to characterize upwind and background PM₁₀ and PM_{2.5} conditions and to assess source attribution for the PM_{2.5} and PM₁₀ NAAQS in nonattainment areas.

The IMPROVE network was started in 1987 as part of a federally-promulgated visibility plan and operated by the Department of the Interior (DOI) under the direction of a multi-agency

federal/state steering committee. EPA expanded the original network in FY 1999 and FY 2000 from approximately 30 sites to 110 sites. The expanded network covers all the Clean Air Act Class I areas where visibility is important (except the Bering Sea area which is impractical to monitor). EPA provides state/local air quality management STAG funds to the DOI to help maintain the IMPROVE network because of the importance of IMPROVE data to development of SIPs for both regional haze and PM NAAQS attainment. The DOI and the other participant organizations contribute more than \$3 million of their own funds or in-kind resources per year to support field operations and other monitoring at IMPROVE sites.

For reasons of convenience and/or consistency of data, many state, tribal, and local monitoring organizations have historically chosen to ask the IMPROVE program to provide field technical support and laboratory services for additional sampling stations at locations under their control, using the IMPROVE protocols for sampler design, sampler operation, and laboratory analysis. Data from these additional “state/local IMPROVE protocol sites” (currently about 50) are managed and made public along with the data from the 110 sites in protected class I areas. These additional sites are provided as associated program support. This arrangement will continue in both FY 2023 and FY 2024. In addition, some federal agencies provide full funding for additional IMPROVE protocol sites to meet various program or research objectives.

State, local, Tribal, and federal monitoring organizations may continue, discontinue, or add IMPROVE protocol sites for the monitoring period which runs from April 1, 2023, through March 30, 2024. Once a monitoring organization has identified its source of funds for such sites, it may contact OAQPS (see below) to request monitoring support services and to begin arranging for the necessary funds transfer. Requests should be made as early in calendar year 2023 as possible, but no later than December 31, 2023. OAQPS is assuming that that monitoring organizations will retain all current state/local IMPROVE protocol sites in 2023.

The FED (Federal Land Managers Environmental Database) can be accessed at <http://views.cira.colostate.edu/fed>. The FED includes news, data and geolocations, as well as IMPROVE data; USFS weather data, ozone data, deposition, and CASTNET data.

For FY 2023 and FY 2024, about \$2.7 million each year of PM_{2.5} monitoring funds appropriated under §103 authority and about \$1.3 million of state/local STAG funds appropriated under §105 authority is being proposed to support visibility monitoring at 110 IMPROVE sites and 2 sites collocated with CASTNET. For more information on the IMPROVE program, contact Joann Rice (rice.joann@epa.gov) or Melinda Beaver (beaver.melinda@epa.gov) in OAQPS.

Planning Information for Ambient Monitoring in Indian countries

EPA respects each tribe’s sovereign ability to identify its air quality goals and to make monitoring decisions it deems appropriate for its needs. This section addresses issues for consideration when conducting ambient air quality monitoring in the context of an EPA grant work plan. There are no Clean Air Act requirements for ambient monitoring in Indian country, so tribes have flexibility in customizing ambient monitoring to address the many different situations they face in terms of air quality and other environmental concerns. Whatever the local situation, the purpose of any ambient monitoring should be to inform the public living in Indian country about the quality of the air where that quality is in doubt, to assist the tribe in managing its air quality, to help the tribe make the case that other governments or private parties need to

control emissions due to their effect on air quality in Indian country, and/or to help track the effects of control actions to verify that they have addressed a problem.

For some tribes ambient monitoring may or may not be a priority for funding compared to other air quality program or environmental program activities. If monitoring is conducted, a tribe's interests can be best served when the type of monitoring is appropriate for the specific situation. For a given tribe, some types of monitoring may be useful, while others may not be relevant. With limited resources available, strategic planning based on thoughtful priorities is needed. The EPA Regional offices will be the principal EPA partners with tribes in this case-by-case planning.

Over the last few years, EPA has emphasized that data from EPA-funded monitors in Indian country should be available to both EPA and the public through the AQS or other relevant national data system, once start-up issues are worked out and the data are reliable. EPA will continue to work with tribes on workable alternatives for data preparation and submission. In awarding grants to tribes with FY 2023 and FY 2024 funds, regional offices are expected to make sure that tribes will have a way to get data submitted, including QA-related data.

In FY 2018, EPA updated the document titled: [*Technical Guidance for the Development of Tribal Air Monitoring Programs*](#) with the intent of providing tribes a better understanding of the ambient air monitoring process and to provide information on resources and tools to help build and sustain an air quality monitoring program. For 2023 and beyond, EPA may provide additional guidance specifically related to tribal air monitoring. Any new guidance will continue to provide flexibility for tribes and regional offices to address the many different air quality situations in Indian country on a case-by-case prioritized basis.

Technical assistance in conducting ambient monitoring is provided to tribes through the Tribal Air Monitoring Support (TAMS) Center (<http://www7.nau.edu/itep/main/tams/>). TAMS staff can provide more specific information on any of the types of monitoring described here.

Additional information on various types of monitoring may be found on EPA's Ambient Monitoring Technology Information Center (AMTIC) at <http://www.epa.gov/amtic>. This website contains information on monitoring policy and guidance for both the criteria pollutants as well as air toxics pollutants.

Program Support for Monitoring (National/Regional Monitoring Procurement Contracts)

EPA makes procurement services available to state and local agencies, via national or regional contracts or interagency agreements, for a variety of support services and materials. These services can be conducted as either associated program support or as in-kind assistance. In providing associated program support, EPA works with regions, tribes, and state and local agencies in advance to identify needs on a national basis and targets funds for the support *before* determining the final Region-by-Region allocation of grant funds (i.e., pre-allotment). In contrast, in-kind assistance is agency-specific and the value of the service is included in the grant agreement of a state, tribe, or local agency *after* final agency-by-agency allotments are

determined. This approach requires the recipient provide an appropriate amount of matching funds and meet other grant administrative obligations relative to the in-kind assistance. This occurs when contract support is requested by a grant recipient after its grant is awarded. Most support to monitoring programs is provided as associated program support, with the in-kind support being used to increase the level of support above planned levels if unexpected needs arise.

Traditionally, OAQPS works with regions to determine the level of funds that each state or tribe wants to allocate for the national procurement contracts. The services offered include assistance in monitoring site set-up and laboratory sample analysis for nonmethane organic compounds, urban air toxics, carbonyls, PAMS, and hazardous air pollutants; performance evaluation (PE) sample support for agencies participating in NATTS; filters for PM₁₀ and Pb in the form of total suspended particulates; PM_{2.5} filters; laboratory services for PM_{2.5} speciation and filter analysis for lead TSP; IMPROVE monitoring services; and independent audits under the NPAP and PEP programs. Audits are usually provided via contracts managed by regional offices. Other services and materials are provided via contracts or interagency agreements managed by OAQPS.

Also available to monitoring organizations is the ability to obtain NADP technical support for speciated ambient mercury monitoring stations via EPA's interagency agreement with the U.S. Department of Agriculture, as associated program support or in-kind service. Organizations interested in this should contact David Schmeltz of EPA's Clean Air Markets Division (schmeltz.david@epa.gov).

In general, funding that would otherwise go to specific agencies in the form of a direct award at the regional office level can be identified in advance for associated program support. This reduces the direct award level to that agency. If associated program support costs identified for a specific agency are not used or are less than anticipated, then these resources would ostensibly be returned to that agency's allotment. However, for some associated program support common to all recipients, there is a fixed EPA cost which does not depend on the number of individual recipients. An example would be the PEP or NPAP programs for auditing monitoring stations, which have fixed costs to pay contractors to maintain measurement standards and keep standard operating procedures current. There may also be variable costs for the contractor labor and supplies to make monitoring station visits. For audits, therefore, changes in the number of audits within a Region will result in a refund of only the variable portion of the cost of the station visits (i.e., the associated program support).

Another exception is that EPA considers the IMPROVE sites representing the Class I visibility protection areas to have benefits for all state air grant recipients because of interstate transport impacts and the responsibility of each state to protect visibility in every Class I area it impacts. Individual states (or regions) therefore cannot "unorder" these monitoring sites and receive back their operating costs. In contrast, the cost of supporting state/local IMPROVE protocol sites is "refundable" to a regional office.

Centralized Site Support and Laboratory Analytical Services - The EPA will continue coordinating centralized laboratory analytical services to support chemical speciation analysis, air toxics, organic compounds, and PAMS programs in FY 2023 with those regional, state, tribal, and local agencies wishing to participate. Examples of services available via the national contracts include those listed below.

Speciated and Total Nonmethane Organic Compound Program (SNMOC/NMOC): The SNMOC/NMOC program has been operating since 1984. The EPA continues to support a centralized program for assistance to state and local agencies in the collection of NMOC, SNMOC, selected toxic compounds, and carbonyl compounds. This program was initiated to provide data for use in development of control strategies for ozone. As part of the SNMOC /NMOC program, participating sites are provided with all necessary sampling equipment, which they may co-locate with NO_x monitors. The SNMOC/NMOC program consists of the following base components:

- Base Site support for sampling equipment preparation, installation and training, problem solving, and final reporting; and
- Canister sample analysis for 78 speciated NMOC or total NMOC.

Options include:

- Analysis for 60 toxic and polar volatile organic compounds (TO-15);
- Cartridge sample analysis for 14 carbonyl compounds (TO-11A); and
- Concurrent analysis for both toxic and polar compounds and speciated NMOC at a cost significantly reduced compared to performing the two analyses separately.

States collect the samples in canisters and/or cartridges and air freight them to Research Triangle Park, NC, for analysis. The samples are collected each weekday from 6:00 to 9:00 a.m. during the summer (typically June 1-September 30). In general, 96 samples are collected at each site over the study period. However, additional samples may be purchased.

Urban Air Toxics Monitoring Program (UATMP): To support emerging needs for information on levels of organic toxic species in ambient air, OAQPS initiated UATMP in 1988. This program serves as an analytical/technical support program like the SNMOC/NMOC program. The major purpose of this program is to support state and local agency efforts to assess the nature and magnitude of various air toxics problems via collection of 24-hour integrated ambient air samples at six- or twelve-day sampling intervals, to be analyzed by a central laboratory, which can report data to EPA's Air Quality System and support site-specific data analyses. This program continues to be highly successful, with excellent overall data capture and data quality that meets well-designed program goals. The UATMP consists of the following base components which can be purchased by SLTs:

- Base site support for sampling equipment preparation, installation and training, problem solving, and final reporting;
- Canister sample analysis for toxic and polar volatile organic compounds (TO-15);
- Cartridge sample analysis for carbonyl compounds (TO-11A);
- Sample analysis for Polycyclic Aromatic Hydrocarbons (PAHs) (TO-13);
- Sample analysis for HAP metals (IO 3.5); and
- Sample analysis for Hexavalent Chromium

Options include:

- Canister sample analysis for 78 speciated NMOC; and
- Concurrent analysis for both toxic and polar compounds and speciated NMOC at a cost that is significantly reduced compared to performing the two analyses separately.

Carbonyl Monitoring: Carbonyl sampling and analysis has been part of the monitoring support options that the Agency has provided since 1990. While carbonyl monitoring support can still be performed simultaneously with other program elements, the independent carbonyl option provides more flexibility for special studies and saturation monitoring programs. The Carbonyl Monitoring Program support consists of the following base components:

- Base site support for sampling equipment preparation, installation and training, problem solving, and final reporting; and
- Cartridge sample analysis for 14 carbonyl compounds (TO-11A).

PAMS and Toxics: PAMS support items will be available to include technical off-site and on-site support (initial equipment set-up, on-site technical assistance, consultation, problem solving, etc.); quality control (QC); and quality assurance (QA) program support (data validation, standards acquisition, and data management support). VOC canister, carbonyl compounds sample and concurrent toxics and speciated hydrocarbon analysis are also available.

The PAMS and toxics technical support program consists of the following base components:

- Technical site support;
- QA/QC support;
- Canister analysis support and retention time cylinder verification for PAMS compounds;
- Cartridge sample analysis for 14 carbonyl compounds (TO-11A); and
- Concurrent analysis for both toxic and polar compounds and speciated NMOC at a cost that is significantly reduced compared to performing the two analyses separately.

The PAMS automated analysis systems and/or multiple canister collection system purchase and installation are the responsibility of the participant. The amount of support an agency can order for the PAMS technical site support and QA/QC components of the program have been divided into smaller increments so that state, and local agencies can order the exact amount of support they require.

Other Hazardous Air Pollutant Analysis: The national monitoring support programs have been expanded to provide for the measurement of additional HAPs to support the effective implementation of the CAA and address the needs of other special studies. Analytical services support is provided for samples containing specific HAPs, which are a subset of the 187 compounds listed in the CAA. Participants are responsible for providing all necessary sampling equipment. The analysis among categories is based upon the specific needs of the state or local agency. This support also will assist the states in implementing the new national ambient monitoring network. The available options under this category include are identical to those offered under the UATMP listing.

- Canister sample analysis for 60 toxic and polar volatile organic compounds (TO-15);

- Cartridge sample analysis for 14 carbonyl compounds (TO-11A);
- Metals (IO-3.5), hexavalent chromium (EPA Method), semivolatiles (EPA Method 8270C), PAHs (TO-13A), etc.

Air Toxics Performance Evaluation Sample Support: Agencies that are participating in the NATTS can receive PE samples on an annual basis. These can include VOCs, Carbonyls, SVOCs and metals on quartz filters. The PE samples shall be generated and analyzed by the national contractor and sent as “blind” samples to the participating agency. If an agency uses the national contractor for analysis, the agency will not be able to use the contractor for PE sample support.

Chemical Speciation Analysis of PM Filters: Services available include:

- Prepared filter media and denuders for sampling and analytical support for the analysis of appropriate sampler filters for gravimetric mass, elements, organic and elemental carbon, and anions and cations.
- Sample filter analysis for optical absorption.
- Preparation and refurbishment of denuder devices, filter pretreatment and the shipment and receipt of filters and denuders to and from the field.
- Providing the associated QA, QC, data validation, computation, and reporting of results into Air Quality System (AQS).
- Storage of filters and filter extract solutions from the CSN.

Lead TSP Filter Analysis: A national contract is available for the analysis of lead TSP (and PM₁₀). Analysis will be done by Inductively-coupled Plasma Mass Spectrometry (ICP-MS) following EPA Federal Equivalent Method EQL-0512-201 or EQL-0512-202 or by X-ray Fluorescence (XRF) analysis of PM₁₀ filters following EPA Appendix Q to 40 CFR Part 50.

For more information on Centralized Site Support and Laboratory Analytical Services, contact Jeff Yane at yane.jeff@epa.gov.

Lead Analysis Audit Development

Lead analysis audits (40 CFR Part 58 Appendix A Section 3.3.4.2) are required to be developed by laboratories that analyze lead for regulatory purposes. Monitoring organizations have the option to develop these quality control samples themselves or opt into a national procurement for the development of the audit filters. Each year OAQPS will solicit monitoring organizations to determine whether they would like these audits developed for their organization. If they decide they would like the audits, approximately \$1500 per set will be allocated from the monitoring organizations STAG resources for development, referee analysis and shipping of these filters to the monitoring organization.

For more information on the Lead Analysis Audits contact Dennis Crumpler via email at crumpler.dennis@epa.gov.

Particulate Matter Filters - OAQPS has historically purchased particulate matter filters (for PM₁₀ monitoring, total suspended particulate sampling used for Pb and other metals monitoring

and PM_{2.5} monitoring) through national contracts and distributed these to state and local agencies across the nation. The economies of scale from this type of centralized purchasing, centralized acceptance testing, and distribution of filters have produced lower costs than if state and local agencies each purchased these filters through their individual agencies. State and local agencies are responsible for providing information to the regions each year on the numbers and types of filters required prior to shipment. For PM₁₀ filters, monitoring agencies will need to specify whether the filters requested are to be used to support high-volume samplers (i.e., 8 in X 10 in quartz filters) or low-volume samplers (i.e., 46.2 mm Teflon filters). For information on filter purchases, contact Greg Noah at noah.greg@epa.gov.