



November 23, 2022

Mr. Peter Tsirigotis
Director, Office of Air Quality Planning and Standards (OAQPS)
Office of Air and Radiation (OAR)
U.S. Environmental Protection Agency (EPA)
109 T.W. Alexander Drive
Durham, NC 27709

Subject: Addressing particulate matter monitoring method comparability

Dear Director Tsirigotis:

This letter is to transmit from the Association of Air Pollution Control Agencies (AAPCA)¹ considerations for improving data comparability between federal reference methods (FRM) and federal equivalent methods (FEM)² for ambient air monitoring of particulate matter (PM). The U.S. Environmental Protection Agency's (EPA) Office of Air Quality Planning and Standards (OAQPS) recognizes the need to address comparability issues between FRMs and FEMs as well as to mitigate challenges for future PM National Ambient Air Quality Standards (NAAQS) attainment designations. State and local air agencies³ are co-regulators under the federal Clean Air Act (CAA) with important on-the-ground expertise, including serving as primary monitoring entities for the NAAQS.

State and local agencies rely on U.S. EPA Office of Research and Development's (ORD) designation of an instrument as "equivalent" to an FRM, which is generally the sole assurance of comparable performance.⁴ The current generation of FEM continuous monitors for fine particulate matter (PM_{2.5}) started being deployed nationwide in 2008,⁵ and these monitors have increasingly been installed to replace aging monitoring infrastructure. Alongside advancements in AirNow, more agencies have acquired FEMs to also collect real-time data for Air Quality Index (AQI) monitoring purposes. When distributing American Rescue Plan (ARP) funding to agencies for air quality monitoring,⁶ U.S. EPA further prioritized the transition to continuous monitoring for PM_{2.5} from filter-based methods. AAPCA observes that air agencies are evaluating trends in data quality primarily from two approved methods⁷ that make

¹ AAPCA is a national, non-profit, consensus-driven organization focused on assisting state and local air quality agencies and personnel with implementation and technical issues associated with the federal Clean Air Act. Created in 2012, AAPCA represents 48 state and local air pollution control agencies, and senior officials from 21 state environmental agencies currently sit on the AAPCA Board of Directors. AAPCA is housed in Lexington, Kentucky as an affiliate of [The Council of State Governments](#). More about AAPCA is at: www.cleanairact.org.

² Methods for measuring ambient concentrations of specified air pollutants have been designated as "reference methods" or "equivalent methods" in accordance with [40 CFR Part 53](#). See U.S. EPA, "[List of Designated Reference and Equivalent Methods](#)," June 15, 2022.

³ AAPCA, [State Air Trends & Successes: The StATS Report](#), April 19, 2022.

⁴ See [40 CFR Part 53 Subpart C](#) – Procedures for Determining Comparability Between Candidate Methods and Reference Methods.

⁵ U.S. EPA, "[Ambient Air Monitoring and NAAQS Overview](#)," August 23, 2022.

⁶ EPA is distributing \$22.5 million in [direct awards under the ARP](#) to state, tribal and local air agencies for criteria pollutant monitoring.

⁷ The Met One BAM 1020 and 1022 utilize beta-attenuation and the Teledyne API T640 and T640x utilize light scattering for measurement.

up a significant majority of the PM_{2.5} continuous FEM monitors currently in use. Critically and despite limited resources, agencies have maintained FRM monitors to meet collocation requirements and in response to known concerns over meaningful differences observed in the data collected from collocated FRM and FEM monitors.

U.S. EPA should incorporate insight from air agencies operating FEMs in the development of future guidance, policies, and rulemaking for the national monitoring network and PM NAAQS. Recent U.S. EPA presentations⁸ have detailed demonstrated FRM/FEM comparability issues that are meaningfully significant in terms of monitoring air quality for public health and could have direct impacts on area designations and/or attainment status under the PM_{2.5} NAAQS. AAPCA has identified several considerations for mitigating these challenges, which are summarized below with key concerns from air agencies as well as research from federal, state, and local partners.

Consider the use of correction factors developed for collocated FRMs and FEMs.

U.S. EPA's NCore Network⁹ provides an example of the FRM/FEM comparability issues air agencies across the United States are experiencing. Using 10 years (2011 – 2020) of NCore data to analyze long-term trends and evaluate instrumentation using multipollutant measurements, U.S. EPA found that “the PM_{2.5} FEM-FRM comparability throughout the NCore network depends on FEM type.”¹⁰ For instance, beta-attenuation FEMs generally exhibited low bias compared to FRMs throughout the NCore Network. Conversely, light scattering FEMs generally overpredicted FRM mass throughout the national monitoring network, and overpredictions were increasingly large during periods indicative of wildfire smoke. In this case, U.S. EPA's analysis to optimize data quality suggested that a correction factor might effectively improve comparability.

AAPCA recommends that when considering the application of a correction factor to data from collocated FRM/FEM PM samplers, U.S. EPA should allow state and local air agencies adequate flexibility in the development, use, and documentation of data adjustments. Air agencies can utilize collocated FRMs and FEMs within their own networks to develop location-specific adjustments; having the flexibility to account for geographic differences in the development of a correction factor may result in better FRM/FEM comparability and data quality. Furthermore, allowing flexibility regarding the scale and application of a correction factor might help to address regional differences in ambient air monitoring. For example, a broad regional adjustment could improve data quality from FEMs that are not collocated with FRMs; likewise, an adjustment developed for better performance during wildfire smoke or high dust events may be applicable for some, not all, of the regulatory monitoring network.

Grant state and local air agencies additional time and flexibility to evaluate FEMs.

State and local ambient air monitoring programs would benefit from additional flexibility and clarity when evaluating the performance and data quality from FEMs in their networks. Agencies using U.S. EPA's PM_{2.5} Continuous Monitor Comparability Assessment¹¹ find that evaluated FEMs may pass the assessment initially but fail in consecutive years, underscoring this need.¹² Additional assessment tool

⁸ See presentations from EPA's [National Ambient Air Monitoring Conference](#) (August 22 – 25, 2022) and AAPCA's [2022 Fall Business Meeting](#) (September 28 – 30, 2022).

⁹ More information about the National Core (NCore) multipollutant monitoring network is available [here](#).

¹⁰ U.S. EPA, “[10 Years, 2011-2020, of the NCore Network: PM_{2.5} FEMs vs FRMs](#),” August 24, 2022.

¹¹ U.S. EPA, “[Technical Note – PM_{2.5} Continuous Monitor Comparability Assessment](#),” updated May 18, 2018.

¹² South Coast AQMD, “[Continuous PM_{2.5} Road to Transition](#),” August 24, 2022.

guidance for evaluating monitor comparability within networks may be appropriate. Continued consideration of special purpose monitor (SPM)¹³ designations and related flexibilities are also an effective tool to help state and local agencies evaluate FEM performance.

Additionally, AAPCA members request that U.S. EPA allow an adequate period for agencies to evaluate forthcoming adjustments once applied. For example, the Teledyne Model T640 particulate instrument specifications state that the monitor's mass concentration accuracy "Exceeds US EPA PM₁₀ FEM and Class III FEM PM_{2.5} performance requirements for additive and multiplicative bias compared to FRM samplers"¹⁴ and a firmware update with a data correction factor is expected. The potential impact of a network-wide firmware adjustment on the computation of design values,¹⁵ which represent a three-year average and are used to designate and classify nonattainment areas as well as to assess progress towards meeting the PM NAAQS, is of critical concern for agencies operating Teledyne T640 instruments for regulatory monitoring. The Association urges U.S. EPA to prioritize flexibility and clarity for monitoring entities using and evaluating Teledyne's expected firmware update in any EPA policy memoranda, technical guidance, or rulemaking.

Appropriately qualify data for inclusion/exclusion in PM NAAQS attainment designations.

Given that in certain instances FEMs can result in annual and 24-hour design values that are meaningfully higher than the design values from collocated FRMs,¹⁶ air agencies are concerned about biased design values leading to erroneous PM NAAQS attainment designations.¹⁷ U.S. EPA has indicated that the final rule revising the PM_{2.5} NAAQS will be issued in March 2023.¹⁸ If U.S. EPA's final rule tightens either the primary or secondary NAAQS for PM_{2.5}, then within *one year* states and tribes will submit attainment recommendations to EPA using available air quality monitoring data. Following within *two years* after setting a new or revised NAAQS, "EPA must identify or 'designate' areas as meeting (attainment areas) or not meeting (nonattainment areas), the standards. Designations are based on the most recent set of air monitoring or modeling data characterizing an area."¹⁹ During this process, AAPCA members anticipate distinct challenges associated with considering the available data from FEMs that may be affected by poor comparability as part of PM_{2.5} NAAQS attainment recommendations and designations.

The Association emphasizes the importance of U.S. EPA working with state and local co-regulators to evaluate air quality monitoring data prior to issuing a final designation on whether an area is meeting a revised standard. U.S. EPA should prioritize feedback from air agencies regarding the handling of historical data impacted by instrument bias and grant agencies appropriate authority to correct, qualify, or exclude affected data, and properly document, before it is used to inform attainment designations. For example, U.S. EPA could allow states the option to apply the forthcoming Teledyne firmware update to previously certified PM_{2.5} measurements; additionally, EPA could support streamlined processes for air agencies to flag potentially biased FEM or FRM data with, and provide evidence of, known quality

¹³ See [40 CFR Part 58 Subpart C](#) – Special Purpose Monitors.

¹⁴ Teledyne Model T640 particulate instrument specifications are available [here](#).

¹⁵ EPA defines a [design value](#) as "a statistic that describes the air quality status of a given location relative to the level of the National Ambient Air Quality Standards (NAAQS)."

¹⁶ South Coast AQMD, "[Continuous PM_{2.5} Road to Transition](#)," August 24, 2022.

¹⁷ More information on EPA's NAAQS Designations Process is available [here](#).

¹⁸ See EPA's [Spring 2022 Unified Agenda of Regulatory and Deregulatory Actions](#), released June 21, 2022.

¹⁹ See [NAAQS Implementation Process](#).

issues. Changes to design values after data certification and publication are precedented²⁰ and intended to result in the best available information for use in attainment determinations.

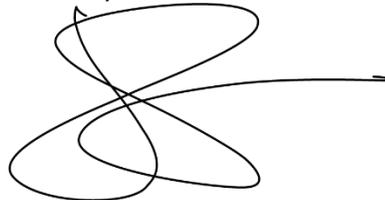
Utilize state and local air agency expertise to direct enhanced air quality monitoring activities.

AAPCA appreciates that U.S. EPA has begun working with state, local, and tribal air agencies to implement two priority recommendations made by the U.S. Government Accountability Office (GAO) for the Agency to (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.²¹ U.S. EPA OAR states in its final Fiscal Years 2023–2024 National Program Guidance (NPG) that “expected air agency activities” will support U.S. EPA in developing an asset management framework and ambient monitoring modernization plan in response to the GAO’s findings.²² Early and collaborative engagement with state and local air agencies will bring important expertise to the development of an asset management framework and modernization plan for the national monitoring network.

AAPCA further appreciates U.S. EPA maintaining the granting authority for PM_{2.5} monitoring under Clean Air Act Section 103, as indicated by the Agency’s removal of the request to transfer PM_{2.5} monitoring from Section 103 to Section 105 in the FY 2023 NPG Monitoring Appendix.²³ Distributing funds for PM_{2.5} monitoring under Section 103 of the Clean Air Act allows state and local agencies to best allocate resources for air quality planning and programs, whereas distributing funds under Section 105 could adversely impact state and local air agency budgets by requiring a match of up to 40 percent.

Thank you for considering the Association’s comments on improving PM monitoring method comparability. AAPCA’s state and local agency members look forward to working with U.S. EPA and the EPA Regional Offices in administering the national ambient air monitoring network. If you have any questions, please contact Mr. Jason Sloan, Executive Director, at jsloan@csg.org or (859) 244-8043.

Sincerely,

A handwritten signature in black ink, consisting of several overlapping loops and a long horizontal stroke extending to the right.

Jason E. Sloan
Executive Director, AAPCA

cc: Mr. Richard Wayland, EPA OAQPS
Mr. Scott Mathias, EPA OAQPS

²⁰ See a variety of reasons design values can change after the date of publication from U.S. EPA [here](#).

²¹ U.S. Government Accountability Office, [Air Pollution: Opportunities to Better Sustain and Modernize the National Air Quality Monitoring System](#), November 12, 2020.

²² U.S. EPA, [“Office of Air and Radiation Final \(OAR\) FY 2023-2024 National Program Guidance,”](#) August 26, 2022.

²³ AAPCA’s comments to U.S. EPA OAR for the Draft FY 2023 – 2024 NPG are available [here](#). Response to Comments and Final FY 2023 – 2024 OAR NPG (August 26, 2022) are available [here](#).