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Paul J. Miller, Executive Director

June 27, 2022

Michael S. Regan, Administrator
U.S. Environmental Protection Agency
EPA Docket Center, Mail Code 28221T
1200 Pennsylvania Avenue, NW
Washington, DC 20460
Attention: Docket ID No. EPA–HQ–OAR–2020–0556

Re: Proposed Rule – Testing Provisions for Air Emission Sources

Dear Administrator Regan:

The Northeast States for Coordinated Air Use Management (NESCAUM) is submitting comments to the U.S. Environmental Protection Agency (EPA) on its Notice of Proposed Rulemaking (NPRM) entitled *Testing Provisions for Air Emission Sources* [(87 Fed. Reg. 24488 (April 26, 2022)]. NESCAUM is the regional association of state air pollution control agencies in Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. Our member agencies have the primary responsibility in their states for implementing clean air programs that achieve the public health and environmental protection goals of the federal Clean Air Act.

NESCAUM strongly supports the proposed test method changes to improve certification testing conducted under EPA's New Source Performance Standards (NSPS) for Residential Wood Heaters (RWH) – Part C and D of EPA's NPRM. The proposed changes will ensure that RWH certification testing comports with long-standing procedures used for other EPA NSPS testing programs.

Wood combustion is responsible for a major share of fine particulate matter ($PM_{2.5}$) pollutant emissions. According to EPA's 2017 National Emissions Inventory (NEI), residential wood heating emitted approximately 340,000 tons of primary (directly emitted) $PM_{2.5}$ in the United States. After road and agriculture dust and fires (wildfire and prescribed), residential wood heating is the largest source of primary $PM_{2.5}$ in the country, exceeding emissions from the highway and off-highway motor vehicle sectors. In all but seven states and the District of Columbia,[1] residential wood heating is one of the top three contributors to $PM_{2.5}$.

Emission testing is a highly technical aspect of residential wood heating regulatory requirements that is critical to identifying low emitting technologies. The proposed changes, if finalized,

[1] Based on 2017 NEI data, the seven states are Hawaii, Louisiana, North Dakota, Tennessee, Texas, Utah, and Wyoming.

NESCAUM Members:
Connecticut Bureau of Air Management, Tracy Babbidge
Maine Bureau of Air Quality Control, Jeff Crawford
Massachusetts Air and Climate Division, Glenn Keith
New Hampshire Air Resources Division, Craig Wright
New Jersey Division of Air Quality, Francis Steitz
New York Division of Air Resources, Chris LaLone
Rhode Island Office of Air Resources, Laurie Grandchamp
Vermont Air Quality & Climate Division, Heidi Hales

would eliminate test method weaknesses during certification testing that undermine confidence in the emissions performance of RWHs during real-world use. In addition to EPA's proposed changes, NESCAUM's comments below provide additional areas for EPA's consideration in ensuring the integrity of EPA RWH certification testing.

EPA Proposed Changes for Standards of Performance for New Residential Wood Heaters (Subpart AAA) of Part 60 and Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters, and Forced-Air Furnaces (Subpart QQQQ) of Part 60

1. **Leak check procedures and parameters**
   The RWH NSPS relies on ASTM E2515 for PM measurements in certification testing. Unlike other EPA Federal Reference Methods (FRMs) for PM measurement, ASTM E2515 allows the use of data from test runs that fail leak checks. The ability to use data from test runs that fail leak checks calls into question the integrity of emission outcomes because leak checks are necessary to verify that the measurements have not been biased low by dilution air. NESCAUM supports revisions to current PM testing to require all valid runs to pass leak checks, and strongly urges EPA to require retesting of any unit that used data with failed leak checks in obtaining EPA certification under the RWH NSPS.

2. **First-hour sampling procedures**
   The RWH NSPS specifies in §60.534 that in all tests conducted using ASTM E2515, "the manufacturer and approved test laboratory must also measure the first hour of particulate matter emissions for the test run using a separate filter in one of the two parallel trains." Certification tests have typically interpreted this requirement to mean that a single filter from one of the two trains could be used to report first-hour emissions because the regulatory language uses the singular for filter. However, the PM measurement requirements in ASTM E2515 do not allow these procedures. ASTM E2515 section 9.8.4 states, "do not change sampling trains during the test run," and section 10.2 requires front and back filter weights to determine PM mass. Therefore, the lab approach to using only the front filters does not conform with ASTM E2515 requirements. NESCAUM supports EPA's efforts to require a third train to obtain the first-hour sampling rate. This approach conforms with ASTM E2515 requirements sections 9.8.4 and 10.2 and ensures appropriate sampling procedures are followed to report first-hour emissions.

3. **General provisions conformance**
   NESCAUM strongly supports EPA efforts to ensure that the RWH NSPS certification test reports include all data necessary to assess and assure the quality of the reported emissions data and appropriately describe and identify the specific unit covered by the

emissions test report. A 2021 NESCAUM report found that publicly posted test reports did not provide complete data needed to conduct reviews for assuring that the testing met all regulatory requirements.[2] NESCAUM strongly supports EPA efforts to increase certification testing data availability and transparency.

4. **Erroneous calculations, subpart QQQQ**
   NESCAUM agrees with EPA's assessment that subpart QQQQ in Method 28WHH, section 13.8, contains erroneous carbon monoxide (CO) calculation instructions for equation 23. We fully support EPA's efforts to correct this error and ensure all calculations are conducted correctly.

Additional Recommended Elements for Standards of Performance for New Residential Wood Heaters (Subpart AAA) of Part 60 and Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters, and Forced-Air Furnaces (Subpart QQQQ) of Part 60

5. **Relative humidity**
   ASTM E2515 contains no provisions to control excessive dilution tunnel temperature, dewpoint, or relative humidity at the sample filter. Lower tunnel flow rates introduce water issues that significantly affect method precision. Lower tunnel flows can also cause extremely high dilution tunnel temperatures, up to 80C on high-fire burns. At these temperatures, little to no condensation of semi-volatile organic compounds (SVOCs) will occur, resulting in under-measurement of PM. Failure to control these elements introduces significant variability to the PM measurements obtained using current FRM test methods for the RWH NSPS. NESCAUM urges EPA to require one-minute monitoring and reporting of dilution tunnel temperature and relative humidity measurements, or other appropriate parameters that when monitored would ensure that condensation is not occurring within the dilution tunnel or the sample train. Measurements should use a probe capable of measuring tunnel temperature to within 0.9F (0.5C) and tunnel relative humidity to within 2 percent. Furthermore, NESCAUM urges EPA to invalidate any test run with a tunnel relative humidity exceeding 90 percent based on ten-minute rolling averages derived from one-minute data, excluding periods when the appliance door is open.

6. **Negative particulate matter (PM) filter weights**
   The RWH NSPS certification program relies on ASTM E2515 gravimetric analysis to determine PM measurements. Negative filter weights occur when the filter weight after

[2] NESCAUM, 2021. *Assessment of EPA's Residential Wood Heater Certification Program*. Accessed on June 14, 2022 at https://www.nescaum.org/documents/nescaum-review-of-epa-rwh-nsps-certification-program-rev-3-30-21.pdf.

testing is less than the filter weight measured before the test. ASTM E2515 does not specify how laboratories should handle negative filter weight values in recovery procedures or calculations. However, it does provide guidance on handling negative values for ambient air filters (section 10.2.1) and probes (section 10.2.2).

NESCAUM believes that allowing labs to subtract negative filter weight values without specifying recovery procedures or limits that invalidate a run, such as the 5 percent threshold used for probes, creates a significant amount of imprecision in the method given the large number of test reports with negative values. NESCAUM with the Alaska Department of Environmental Conservation (ADEC) reviewed 155 test reports and found that 55 percent of the cordwood stove tests reported negative PM filter weight values for at least one test run, and 35 percent of pellet stove reports contained negative filter values.

Because EPA has not provided guidance regarding proper procedures for addressing negative filter weight values, our reviews turned to test methods from the Oregon Department of Environmental Quality (OR DEQ). ASTM 2515, the PM measurement method, is a derivative of EPA Method 5G, derived from an OR DEQ measurement method. The original OR DEQ method required acetone rinses of the testing train to ensure all particulate materials were captured. The OR DEQ method clearly provides that "[t]he blank corrections for the filter and/or rinse samples are '0' if the blank filter or rinse samples yield negative weight gains."[3]

NESCAUM recommends that EPA require labs to conduct recovery on all filter measurements. If recovery efforts yield negative values greater than 5 percent of the total mass or the lab does not conduct recovery, the run should be invalid, following the process laid out in ASTM E2515 for negative probe weights.

7. Testing at outside facilities/improved documentation for dilution tunnels

The RWH NSPS describes requirements for certification testing laboratories. Section 60.531 defines an "Approved Test Laboratory" as "a test laboratory that is approved for wood heater certification testing under § 60.535 or is an independent third-party test laboratory that is accredited under ISO-IEC Standard 17025 to perform testing using the test methods specified in § 60.534 by an accreditation body that is a full member signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement and approved by the EPA for conducting testing under this subpart." Section 60.535 outlines requirements for test laboratory approval for conducting certification tests under the RWH NSPS. Section 60.535(a)(1) specifies that

[3] Oregon Department of Environmental Quality, *Source Sampling Manual,* Volume 1, revised November 2018, p. C-8.14.

the lab must provide accreditation under ISO-IEC Standard 17025. These requirements include annual inspections to ensure that lab equipment, including the dilution tunnel, conforms with method requirements. However, EPA has allowed testing at outside facilities that have not been approved by EPA, such as manufacturers or consultant test facilities, where the unapproved facilities supply the setup and fuels. Report reviews indicate that the test reports do not fully document the dilution tunnels used for these tests, making it impossible to determine if the dilution tunnels meet ASTM and ISO requirements detailed in the RWH NSPS. NESCAUM could also not find any documentation indicating that these outside facilities had undergone inspections to assure compliance with NSPS and test method requirements. The lack of test setup and other documentation, and the ability of the manufacturer to determine fuel selection, raises concerns about testing integrity. NESCAUM with ADEC reviewed 238 certification test reports and found that only 2 of 102 pellet stove tests (<2 percent) were conducted outside of the laboratory, while 44 of 136 cordwood stove tests (almost one-third) were conducted at manufacturer or consultant labs. When compared to pellet stoves, the much greater use of outside labs for cordwood stove tests raises questions regarding testing integrity. NESCAUM urges EPA to eliminate the ability to use outside laboratory facilities for certification testing.

8. **Dual train precision**

Section 11.7 of ASTM Method 2515 requires two sampling trains, which are the media collection systems used in the testing. The PM results from the sampling trains are used to calculate two measurement accuracy and precision indicators. The first indicator, train precision, assesses the PM catch measurements between the two trains. ASTM 2515 specifies that train precision cannot exceed 7.5 percent. ASTM E2515 provides a second indicator to consider in addition to the dual train agreement. ASTM E2515 allows a run to be valid if the measured emission factors in grams per kilogram (g/kg) for the two trains do not exceed 0.5 g/kg. Unlike the train precision percentage requirement, the g/kg assessment provides a loophole to validate test runs with poor train precision. For example, the Travis Answer NexGen Hybrid-Frye certification test consisted of five test runs. All five test runs failed the 7.5 percent train precision with values ranging from 8.49 percent to 20.31 percent. However, the test was considered valid because none of the test runs exceeded the 0.5 g/kg threshold. The NESCAUM/ADEC review of test reports found that 43 percent of the 136 test reports reviewed did not report the percentage metric. Twenty-two percent of the reports containing the percentage metric had runs exceeding the 7.5 percent train precision metric. These data raise concerns about PM measurement precision. NESCAUM urges EPA to only use the 7.5 percent metric for evaluating the precision of PM measurements.

9. **Dilution tunnel mixing assessment**
   Currently, ASTM E2515 does not include any requirements to determine if the dilution tunnel is well mixed. To improve the assessment and precision of future PM emissions testing, NESCAUM urges EPA to require all test labs to conduct an assessment of dilution tunnel mixing conditions for any dilution tunnel used for certification testing. This assessment must demonstrate that the lab's dilution tunnel is well-mixed before conducting any emission tests used for regulatory purposes.

Thank you for this proposal and your consideration of these comments.

Sincerely,

Paul J. Miller
Executive Director

cc: NESCAUM Directors
EPA Regions 1 & 2