ORAL ARGUMENT NOT YET SCHEDULED

IN THE UNITED STATES DISTRICT COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 12-1309 (and consolidated cases)

MISSISSIPPI COMMISSION ON ENVIRONMENTAL QUALITY,
Petitioner,

v.

ENVIRONMENTAL PROTECTION AGENCY, *et al.*,
Respondents.

STATE OF CONNECTICUT, *et al.*,
Intervenors.

Petition for Review of Final Administrative Action of the
United States Environmental Protection Agency

ENVIRONMENTAL PETITIONERS' JOINT OPENING BRIEF

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Dated: September 17, 2013

CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES

I. THE PARTIES

This case involves petitions for review of final agency action, not an appeal from the ruling of a district court. Sierra Club is the Petitioner in Case Nos. 12-1317 and 13-1030. Petitioners in Case Nos. 12-1326 and 13-1032 are WildEarth Guardians, Southern Utah Wilderness Alliance, and Utah Physicians for a Healthy Environment (collectively "Guardians"). Petitioners in the other consolidated case are as follows:

12-1309: Mississippi Commission on Environmental Quality

12-1310: Delaware Department of Natural Resources

12-1312, 13-1051: Texas Pipeline Association

12-1313, 13-1046: Wise County, Texas

12-1314, 13-1061: State of Tennessee

12-1315: State of Indiana

12-1316, 13-1053: State of Texas, Texas Commission on Environmental Quality

12-1318, 13-1052: Gas Processors Association

12-1322, 13-1050: Devon Energy Corp.

12-1323, 13-1054: Targa Resources Corp.

12-1324, 13-1055: Shelby County, Tennessee

12-1325: Anderson County, Tennessee, Blount County, Tennessee, and Knox County, Tennessee

12-1328: Desoto County, Mississippi

The Respondents in all the consolidated cases are the United States Environmental Protection Agency (EPA) and Gina McCarthy, EPA Administrator.

Respondent-Intervenors in Guardian's Case No. 12-1326 include the State of Utah, Uintah County, Utah, Uintah Impact Mitigation Special Service District, Utah Association of Counties, and Western Energy Alliance. Environmental Defense Fund is a Respondent-Intervenor in Case Nos. 12-1312, 12-1313, 12-1316, 12-1318, 12-1322, and 12-1323. State of Connecticut is a Petitioner-Intervenor in Case Nos. 12-309, 12-1310.

Currently, there are no amici curiae.

II. RULINGS UNDER REVIEW

Environmental Petitioners seek review of the final action by the Environmental Protection Agency (EPA) entitled "Air Quality Designations for the 2008 Ozone National Ambient Air Quality Standards," EPA Docket Number EPA-HQ-OAR-2008-0476, 77 Fed. Reg. 30,088 (May 21, 2012).

Environmental Petitioners also seek review of the final action by the Environmental Protection Agency (EPA) entitled "Air Quality Designations for the 2008 Ozone National Ambient Air Quality Standards: Notice of Actions Denying Petitions for Reconsideration and Stay Requests," 78 Fed. Reg. 925 (Jan. 7, 2013).

III. RELATED CASES

Petitioners are unaware of any related cases (other than those already consolidated).

DATED: September 17, 2013

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RULE 26.1 DISCLOSURE STATEMENTS

Sierra Club has no parent companies, and there are no publicly held companies that have a 10 percent or greater ownership interest in Sierra Club. Sierra Club, a corporation organized and existing under the laws of the State of California, is a not-for-profit organization which works to explore, enjoy and protect the planet.

WildEarth Guardians is a non-profit 501(c)(3) organization. It has no parent company or corporation and no publicly held company or corporation owns 10% or more of its stock or ownership.

Southern Utah Wilderness Alliance is a non-profit 501(c)(3) organization. It has no parent company or corporation and no publicly held company or corporation owns 10% or more of its stock or ownership.

Utah Physicians For a Healthy Environment is a Utah corporation and a non-profit 501(c)(3) organization. It has no parent company or corporation and no publicly held company or corporation owns 10% or more of its stock or ownership.

DATED: September 17, 2013

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

Pursuant to Circuit Rule 28(a)(3), the following is a glossary of acronyms and abbreviations used in this brief:

AQS	EPA's Air Quality System
AR-	Document numbers in EPA docket number EPA-HQ-OAR-2008-0476
CAA, the Act	Clean Air Act
EPA	United States Environmental Protection Agency
Guardians	WildEarth Guardians, Southern Utah Wilderness Alliance, and Utah Physicians for a Healthy Environment
NAAQS	National Ambient Air Quality Standards
NOx	Nitrogen oxides
ppm	Parts per million
VOCs	Volatile Organic Compounds

JURISDICTIONAL STATEMENT

(A) Agency: The Environmental Protection Agency (EPA) has jurisdiction to make national ambient air quality (NAAQS) designations. 42 U.S.C. § 7407(d).

(B) Court of Appeals: This Court has jurisdiction to review EPA's final NAAQS designations and denials of petitions for reconsideration. *Id.* §§ 7607(b)(1), (d)(7)(B).

(C) Timeliness: The Clean Air Act (CAA or Act) requires Petitions for Review to be filed within sixty days. *Id.* § 7607(b)(1). EPA published the 2008 ozone designations on May 21, 2012. 77 Fed. Reg. 30,088 (May 21, 2012). WildEarth Guardians, Southern Utah Wilderness Alliance, and Utah Physicians for a Healthy Environment (collectively "Guardians") and Sierra Club filed their respective Petitions on July 20, 2012. EPA published notice of its denial of all petitions for reconsideration on January 7, 2013. 78 Fed. Reg. 925 (Jan. 7, 2013). Sierra Club and Guardians filed Petitions challenging EPA's denials on February 12 and 14, 2013, respectively.

STATUTES AND REGULATIONS

Pertinent statutes and regulations appear in an addendum.

STATEMENT OF THE ISSUES PRESENTED

This Joint Brief addresses four Petitions for Review. Sierra Club's two Petitions involve fifteen counties located throughout the U.S. Guardians' two Petitions involve the Uinta Basin, located in northeastern Utah.

Sierra Club: Whether EPA acted arbitrarily and contrary to the CAA by allowing states to choose to have EPA designate fifteen areas attainment despite the most recent monitoring showing violations of the ozone NAAQS, while EPA designated other areas nonattainment based on the most recent monitoring.

Guardians: Whether EPA's refusal to designate the Uinta Basin as a nonattainment area despite undisputed, EPA-mandated monitoring demonstrating significant violations of the 2008 ozone NAAQS violates the CAA and is arbitrary.

STATEMENT OF THE FACTS

I. General Background

Ground-level ozone forms when volatile organic compounds ("VOCs") and nitrogen oxides ("NOx") react in sunlight. 77 Fed. Reg. at 30,089. Ozone is a dangerous pollutant that impairs breathing, aggravates asthma, increases emergency room visits, and even leads to premature deaths. 73 Fed. Reg. 16,436, 16,476 (Mar. 27, 2008). Children, the elderly, and people with respiratory conditions are most at risk from ozone pollution. *Id.* at 16,471.

On March 12, 2008, EPA revised the ozone NAAQS. *Id.* at 16,436.

Recognizing that existing standards were inadequate to protect public health and welfare, EPA lowered the standard from 0.08 parts per million (ppm) to 0.075 ppm. *Id.* EPA determines compliance through ambient air quality monitoring. Compliance is based on the "3-year average of the annual fourth-highest daily maximum 8-hour average concentration." 40 C.F.R. § 50.15(b).[1]

Once EPA promulgates a new NAAQS, it must designate all areas of the country as either attainment, nonattainment, or unclassifiable. 42 U.S.C. § 7407(d)(1)(B)(i). Attainment is defined as "any area . . . that meets the [NAAQS] for the pollutant." *Id.* § 7407(d)(1)(A)(i). Nonattainment is "any area that does not meet . . . the [NAAQS]." *Id.* § 7407(d)(1)(A)(ii). Unclassifiable is an area that "cannot be classified on the basis of available information as meeting or not meeting the [NAAQS]." *Id.* § 7407(d)(1)(A)(iii). Nonattainment designations trigger additional CAA mandates to reduce pollution. *See* 42 U.S.C. §§ 7502(c), 7511.

Although states and tribes submit initial designation recommendations for areas within their jurisdiction, EPA may make any modifications it "deems necessary." 42 U.S.C. § 7407(d)(1)(B)(ii). EPA must make final designations

[1] Monitors must use a "reference or equivalent method" to measure ozone and report the daily maximum concentration averaged over any eight hour period. 40 C.F.R. § 50.15(a) & App. P § 2.1. EPA calculates a monitor's "design value" by taking the fourth-highest, eight-hour concentration each year for three years and averaging them. *Id.* App. P § 2.2, 2.3. There is a violation if the "design value" exceeds 0.075 ppm. *Id.* § 2.3, 3.

within two years of revising a NAAQS, subject to a one year extension if there is "insufficient information." *Id.* § 7407(d)(1)(B)(i).

II. EPA Failed to Designate Fifteen Counties Nonattainment Despite the Most Recent Monitoring Data Showing NAAQS Violations

On December 4, 2008, EPA issued guidance for states to use in making 2008 ozone designation recommendations, in which it explained: "We expect to base the final designations in March 2010 on the most recent quality-assured data which would be from 2006-2008 or 2007-2009." AR-0002 at 2 [JA-].[2] In other words, EPA gave states a choice of which ambient monitoring data EPA would use to make designations.

EPA required states and tribes to submit their initial recommendations by March 2009, but EPA missed the statutory deadline for finalizing designations. 77 Fed. Reg. at 30,090-91.[3] Guardians sued EPA, settling with a consent decree that required EPA to sign a final rule by May 31, 2012. *Id.* at 30,091. States were required to certify 2011 ozone ambient monitoring data to EPA by no later than May 1, 2012, which is obviously before the May 31, 2012 deadline. *Id.*

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[2] Documents in the administrative record labeled with document number EPA-HQ-OAR-2008-0476-#### will be cited as AR-####.

[3] EPA stalled the designation process in 2009 to reconsider the 2008 ozone standard. EPA proposed lowering the standard to the 0.060-0.070 ppm range, based upon a unanimous finding by EPA's independent scientific advisors that the 0.075 ppm standard "fails . . . [to] ensure an adequate margin of safety for all individuals." 75 Fed. Reg. 2,938, 2,992 (Jan. 10, 2010). EPA never finalized this proposal.

EPA issued another guidance memorandum on September 22, 2011. AR-0105 [JA-]. In it, EPA explained that because it had states' recommendations as well as quality-assured monitoring data for 2008-2010, the states did not need to do anything until EPA issued its proposed modifications, which it refers to as "120-day letters" because EPA must issue any proposed modifications 120 days before taking final action. *Id.* at 1-2.

On December 9, 2011, EPA notified the states and tribes via 120-day letters of any "preliminary" modifications to their initial designation recommendations. 77 Fed. Reg. at 30,091. EPA requested "states submit any additional information they wanted EPA to consider by February 29, 201[2], including any certified 2011 air quality monitoring data." *Id.* Seven states chose not to submit certified 2011 air quality monitoring data for fifteen counties where monitors showed violations of the ozone standard based on 2009-2011 data. Instead, the states continued to rely on 2008-2010 data.

The fifteen counties include: Montgomery (Ohio); Macomb, Wayne, Allegan and Muskegon (Michigan); Clinton (Missouri); Gregg and Jefferson (Texas); Jefferson and Oldham (Kentucky); Jefferson and Bossier Parishes (Louisiana); Oklahoma and Tulsa (Oklahoma); and Manitowoc (Wisconsin). The metropolitan statistical areas containing these counties collectively have a population of approximately ten million people.

On January 31, 2012, EPA "sent revised 120-day letter responses to Illinois, Indiana, and Wisconsin based on updated ozone air quality data for 2009-2011, submitted by the state of Illinois two days before the EPA sent the December 9, 2011 letters." *Id.* EPA informed these states that it intended to designate certain counties in Metro-Chicago nonattainment based on 2009-2011 monitoring data. EPA did not send similar letters to the states containing the fifteen counties. *See* AR-0420, at 3, Table 1 [JA-]. EPA acknowledged that it could and would make final nonattainment designations for the Metro-Chicago nonattainment area based on 2009-2011 monitoring data by the May 31, 2012 consent decree deadline. 77 Fed. Reg. at 30,091.

EPA then provided an opportunity for public comment on its proposed designations, with a comment deadline of February 3, 2012. *Id.* Sierra Club submitted comments identifying fifteen counties plus counties in Metro-Chicago that were violating the 2008 ozone NAAQS based on the most recent monitoring data (2009-2011) available in EPA's Air Quality System (AQS). AR-0420 at 2-3 [JA-]. Not only was the 2009-2011 data the most recent available, it was also less influenced by the Great Recession of 2008, which saw ozone levels drop as the economy did the same.

The relevant 2009-2011 monitoring data for these fifteen counties was required to be edited and validated, that is quality assured, by the time Sierra Club

submitted it on February 3, 2012. *See* 40 C.F.R. § 58.16(a)-(c). For these areas, the relevant data for 2011 is the first three quarters of the year because the ozone season, when ozone is typically worst, is from May 1 to September 30. 76 Fed. Reg. 48,208, 48,264 (Aug. 8, 2011). States were required to submit air quality data and associated quality assurance data to EPA's AQS for the first three quarters by December 30, 2011. 40 C.F.R. § 58.16(a)-(c). Although the relevant 2011 data was required to be in the AQS and quality assured before Sierra Club submitted its comments on February 3, 2012, states were not required to submit their annual monitoring data certification letter, which covers all ambient monitoring data including that based on annual averages, until May 1, 2012. *Id.* § 58.15(a). Notably, this certification deadline was still prior to EPA's consent decree deadline for finalizing designations. On February 14, 2012, EPA reopened the public comment period only to accept comments on its proposal to designate Metro-Chicago as nonattainment based on 2009-2011 data. 77 Fed. Reg. at 30,091.

Although its deadline under the consent decree was not until May 31, 2012, EPA signed the final designations on April 30, 2012 and published notice in the Federal Register on May 21, 2012. *Id.* at 30,095. EPA signed the final rule designating Metro-Chicago as nonattainment based on 2009-2011 data on May 31, 2012. 77 Fed. Reg. 34,221, 34,227 (June 11, 2012).

III. EPA Failed to Make a Nonattainment Designation for the Uinta Basin Despite Severe Ozone Pollution

A. The Uinta Basin Has Some of the Worst Ozone Pollution in the Nation

While ozone was long thought to be primarily an urban problem, recently EPA has acknowledged severe wintertime ozone violations in rural areas with significant oil and gas and other industrial development, such as the Uinta Basin and the Upper Green River Basin in Wyoming. *See* 77 Fed. Reg. at 30,089; AR-0205 at 4 [JA-]; AR-0215 at 2 [JA-]. The Uinta Basin is a geologic basin that includes much of the northeastern corner of Utah, extending into northwestern Colorado. *See* AR-0711 App. 1.

In the Uinta Basin, NOx and VOC emissions are trapped near the ground by stagnant air and converted to ozone by intense sunlight reflecting off snow. *See* AR-0205 at 4 [JA-]. When these conditions occur, these areas experience ozone levels exceeding those of the most heavily populated American cities. *See* AR-0711 at 2 & App. 112-123 [JA-] (showing that, in 2010 and 2011, Uintah County's ozone levels exceeded Los Angeles County's worst ozone days).

B. Monitoring Demonstrates that Air Quality in the Uinta Basin Exceeds the NAAQS

EPA does not usually require states to monitor in rural areas like the Uinta Basin. 40 C.F.R. § 58, App. D, Tables D-1 & D-2; *accord* AR-0622 at 12-13 [JA-]

(confirming that Utah does not operate an ozone monitor in the Uinta Basin).[4] In response to growing ozone pollution from oil and gas development, however, EPA required private oil and gas companies to begin ozone monitoring in the Uinta Basin in 2009.

In 2007, EPA brought a CAA enforcement action against Kerr-McGee. EPA and Kerr-McGee settled through a consent decree, which required Kerr-McGee to fund, install, and operate ambient air quality monitors in the Uinta Basin to monitor ozone and other pollutants. AR-0711 App. 166-67; *see also id.* at 225-227, 275-76 [JA-] (providing for continued funding and operation of the monitors through subsequent consent decrees). The two monitors are known as the Redwash and Ouray monitors.

Private monitoring is not subject to EPA's regulations governing state monitoring networks found at 40 C.F.R. Part 58. But the consent decrees mandate that the two monitors "shall meet the siting, methodology and operation requirements of 40 C.F.R. Part 58." *Id.* App. 167 [JA-]. Accordingly, the private

[4] Although states must establish a minimum ozone monitoring network, 40 C.F.R. § 58.2(a)(5), EPA only requires monitoring in urban areas during warmer months. *Id.* App. D, Tables D-1 & D-2. EPA has recognized the need to update its regulations to address wintertime violations in less-populated areas. *See* 73 Fed. Reg. at 16,502-03. EPA even issued a proposal to do so, which specifically identified the wintertime ozone problems in Wyoming and Utah. 74 Fed. Reg. 34,525, 34,533 (Jul. 16, 2009); 75 Fed. Reg. 69,036 (Nov. 10, 2010) (supplementing the record with Uinta Basin monitoring data). However, EPA has not finalized any changes and recently stated the schedule for doing so "remains unclear at this time." 78 Fed. Reg. 34,178, 34,203 (June 6, 2013).

companies were required to use EPA-approved measurement technologies and locate the monitors at certain elevations, in the path of the predominant wind direction, and away from obstructions like buildings. *See* 40 C.F.R. § 58, Apps. C, E. EPA admits the monitors meet these standards. AR-0675 at 72 [JA-]. The monitors were installed in two widely-separated areas within the heart of the Uinta Basin, at locations approved by EPA. *See* AR-0711 App. 28-29, 167 [JA-].

EPA's consent decree also mandated that "[a]ll monitoring data shall be collected in a manner reasonably calculated to meet EPA's quality assurance/quality control . . . requirements of 40 C.F.R. Part 58, App. A." *Id.* App. 167 [JA-]. EPA admits that the private contractor hired to install and operate the monitors developed a quality assurance plan, and that the 2009-2011 data was collected in a manner reasonably calculated to meet the requirements of Appendix A. AR-0675 at 73 [JA-].

Since 2009, the Redwash and Ouray monitors have measured numerous, significant exceedances of the 2008 ozone standard of 0.075 ppm. In 2010, the Redwash and Ouray monitors each measured more than 30 exceedances (that is, individual instances when the eight-hour ozone levels exceeded the standard). *See* AR-0711 App. 113 [JA-]. In 2011, the monitors each measured more than 20 exceedances, and the Ouray monitor recorded an eight-hour concentration of 0.139 ppm—nearly twice the federal standard. *Id.* App. 115 [JA-]. The design value for

the Redwash monitor between 2009 and 2011 was 0.088 ppm and for the Ouray monitor was 0.100 ppm, both of which violate the 0.075 ppm standard by wide margins. AR-0440 at 14-16 [JA-]; *see supra* n.1.

Other monitors that EPA also considers "non-regulatory" have confirmed the high ozone levels in the Basin. As part of a study conducted between December 2010 and March 2011, the State of Utah compiled data from six existing monitors and ten new monitors installed throughout the Uinta Basin. AR-0711 App. 13 [JA-]. All but two monitors recorded ozone levels well above the federal standard; ten monitors recorded eight-hour concentrations above 0.100 ppm. *Id.* App. 49 [JA-]. The Myton monitor in the Uinta Basin and the National Park Service's Dinosaur National Monument monitor, just east of the Uinta Basin, also confirmed significant ozone violations in 2011.[5] The Myton monitor recorded nineteen exceedances, and the Dinosaur monitor recorded eight. AR-0711 at 4-5, App. 115 [JA-].

EPA has acknowledged that the Redwash and Ouray monitoring data is "*reliable and of good quality*." *Id.* App. 320 (emphasis added). In fact, EPA has urged federal agencies to rely on the data when assessing the impacts of oil and gas development in the Uinta Basin. *Id.* App. 325 [JA-] (EPA notifying the Bureau of Land Management that "[m]easured ambient concentrations of ozone in the Uinta

[5] The Myton monitor is operated by Ute Indian Tribe of the Uintah and Ouray Reservation. A large part of the Uinta Basin is tribal land.

Basin during the period of January through March 2010 reached levels that are considerably above the NAAQS"); *id.* App. 368-69 (EPA commenting that the Forest Service needed to strengthen its analysis of an oil and gas project "given recent ambient concentrations of ozone measured in the project area, which exceed the NAAQS"). According to EPA, "it is clear that the measured values are a concern for public health." *Id.* App. 359 [JA-].

C. Despite Uncontroverted Evidence Showing a Serious Ozone Problem, EPA Failed to Designate the Uinta Basin Nonattainment

EPA recognized that the Redwash and Ouray monitors "detected levels of wintertime ozone that exceed the NAAQS [between 2009-2011]." AR-0215 at 2 [JA-]. But EPA declined to rely on this data to make a nonattainment designation, claiming the data was "non-regulatory." 77 Fed Reg. at 30,089; AR-0751 at 1, Enclosure at 3 [JA-] (arguing that reliance on EPA-mandated private monitoring would not be "defensible" or "withstand court challenge").

Although EPA does not claim the data is flawed, EPA argues it cannot use the data for regulatory purposes because private companies are not bound by Part 58. AR-0675 at 72-73 [JA-]. Without support or explanation, EPA claims that the consent decrees do not provide the level of EPA-oversight that is "inherent" in Part 58. *Id.* at 73. EPA also objects that it failed to approve the monitors' quality assurance plans, and that certain quality checks have not been reported to AQS. *Id.*; AR-0751 Enclosure at 4.

Although EPA refused to rely on the data to make a nonattainment designation, EPA nonetheless relied on it to designate the Uinta Basin as the only "unclassifiable" area in the country. 77 Fed. Reg. at 30,089.[6] For all other areas not designated nonattainment, EPA made an "unclassifiable/attainment" designation, meaning there was either no monitoring data or that the data demonstrated attainment. *Id.* For the Uinta Basin, EPA carved out an "unclassifiable" designation based on the "non-regulatory" data.

STANDARD OF REVIEW

At issue is whether EPA's action was "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 42 U.S.C. § 7607(d)(9). Agency action is arbitrary if the agency's rationale is unsupported by or runs counter to the evidence in the record. *See Motor Vehicles Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43-44 (1983).

"[I]f the intent of Congress is clear, that is the end of the matter; for the court . . . must give effect to the unambiguously expressed intent of Congress." *Chevron U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 842-43 (1984) (*Chevron* step one). This Court looks to the plain language, legislative history, and purpose of the statute to determine Congress' intent. *Bell Atl. Tel. Cos. v. FCC*,

[6] In contrast with the fifteen counties addressed in Sierra Club's argument *supra*, EPA relied on the 2009-2011 Redwash and Ouray data. AR-0215 at 2[JA-].

131 F.3d 1044, 1047 (D.C. Cir. 1997). If Congress' intent is ambiguous, the agency's interpretation may be upheld only if it is reasonable. *Chevron*, 467 U.S. at 843 (*Chevron* step two).

SUMMARY OF THE ARGUMENT

Sierra Club: EPA allowed states to choose whether EPA would base area designations on monitoring data from 2008-2010 or 2009-2011. As a result, EPA failed to make nonattainment designations for fifteen counties even though those counties are in nonattainment based on 2009-2011 data. Yet, EPA designated Metro-Chicago nonattainment based on 2009-2011 monitoring data. EPA arbitrarily treated similarly situated areas differently in making these area designations. EPA's arbitrary failure to designate these fifteen counties nonattainment violates the CAA and leaves approximately ten million people exposed to dangerous air pollution.

Guardians: EPA concedes that reliable monitoring data shows violations of the ozone NAAQS within the Uinta Basin, posing a threat to the health of its residents. Although EPA mandated monitoring to address the growing ozone problem, it now claims that it must turn a blind eye to the data because it is "non-regulatory." In doing so, EPA is allowing an area suffering from some of the country's worst ozone pollution to avoid a nonattainment designation. EPA's actions violate the Act, defy Congressional intent, and lack a rational explanation.

STANDING

Petitioners have standing because their members have suffered (1) injury in fact, (2) that is fairly traceable to the challenged rule, and (3) that is redressable by a favorable decision. *Lujan v. Defenders of Wildlife,* 504 U.S. 555, 560-61 (1992).

Petitioners' members live, work, and recreate in the fifteen counties and the Uinta Basin and are harmed by pollution that exceeds the 2008 ozone NAAQS. *See* Attached Declarations. Ozone pollution exposes them to increased health risks, forces them to refrain from or curtail their activities, and diminishes their enjoyment of recreational and aesthetic activities. For example, Beth Young of Dayton, Ohio—which lies within one of the fifteen counties—has twice been admitted to the emergency room because of poor air quality and diagnosed with deep respiratory infections. Ex. 3 ¶ 5 (Declaration of Beth Young).

EPA's failure to make nonattainment designations for the disputed area means these areas will not be required to implement emission reduction measures designed to achieve the NAAQS. *See* 42 U.S.C. §§ 7502(c), 7511. A favorable decision from this Court would redress Petitioners' injuries by providing greater protection for their members' health. Petitioners therefore have standing. *See, e.g., Ass'n of Battery Recyclers, Inc. v. EPA*, 716 F.3d 667, 672-73 (D.C. Cir. 2013).

ARGUMENT

I. EPA's Allowing States to Choose Whether They Would Have Nonattainment Designations, Regardless of Whether They Were Violating the 2008 Ozone NAAQS, Was Arbitrary, Capricious and Contrary to the Act

A. EPA Violated a Fundamental Tenet of the Act that EPA Must Designate Areas that Are Violating the NAAQS as Nonattainment

The CAA is "an emphatic expression of Congress's intent that the air Americans breathe be clean." *New Jersey v. EPA*, 626 F.2d 1038, 1040 (D.C. Cir. 1980). Moreover, "Congress . . . understood that the 'non-attainment of air quality standards in a wide and densely populated region could result in a phenomenal health impact, measured in terms of millions of days of aggravated disease, asthma attacks and lower respiratory disease episodes.'" *Id.* (quoting legislative history).

To implement Congress' intent, "[a]reas are to be designated nonattainment if they . . . violate the [NAAQS]." *ATK Launch Sys., Inc. v. EPA*, 669 F.3d 330, 334 (D.C. Cir. 2012). Contrary to Congress' intent, here, EPA made designations for the 2008 ozone NAAQS for fifteen counties based on 2008-2010 monitoring data even through their 2009-2011 data showed NAAQS violations. At the same time, EPA made designations for other areas based on 2009-2011 monitoring data. The only determinant of which data EPA used was which data the individual states chose to use.

All states were capable of using the 2009-2011 data. Thus, Sierra Club's issue is not technical in nature. Nor is this an issue about new evidence which must be excluded based on the necessity for all administrative processes to come to an end, although EPA struggles to make it such. Rather, the issue is whether EPA violated a fundamental tenet of the Act: that "those areas that do not comply [with the NAAQS] will ultimately be required to do so." *Am. Trucking Ass'ns v. EPA*, 195 F.3d 4, 9 (D.C. Cir. 1999) *affirmed in part, rev'd in part on other grounds* 531 U.S. 457 (2001).

B. EPA Violated the Act by Not Designating Fifteen Counties Nonattainment Based on the Most Recent Air Quality Data While Designating Metro-Chicago Nonattainment Based on the Most Recent Air Quality Data

"Areas are to be designated nonattainment if they . . . violate the [national ambient air quality] standard[.]" *ATK*, 669 F.3d at 334. The Act does not state and no court has ever held that EPA has discretion to allow states to choose to have areas designated attainment if they are violating the NAAQS. Also, this Court has held that treating areas of the country inconsistently "is evidence of an arbitrary designation[.]" *Catawba Cnty. v. EPA*, 571 F.3d 20, 48, 51 (D.C. Cir. 2009). Finally, this Court has held that an agency has "an obligation to deal with newly acquired evidence in some reasonable fashion." *Id.* at 45 (quotation omitted).

Quality-assured ambient monitoring data gathered by states and contained in EPA's AQS shows that from 2009-2011, fifteen counties were violating the 2008

ozone NAAQS. *See* AR-0420 at 2-3, Table 1, Attachment [JA-]; AR-0712 Table 1 [JA-]. However, EPA failed to designate the fifteen counties nonattainment in violation of the Act. *ATK*, 669 F.3d at 334.

Moreover, EPA treated different areas of the country inconsistently. EPA designated Metro-Chicago nonattainment based on violating 2009-2011 data. 77 Fed. Reg. at 34,224. In contrast, EPA arbitrarily designated the fifteen counties attainment even though their 2009-2011 monitoring data showed NAAQS violations. *Catawba*, 571 F.3d at 48, 51.

Sierra Club submitted the 2009-2011 data for the fifteen counties to EPA in Sierra Club's comments and again in its Petition for Reconsideration. At the time of both submissions, the relevant data was required to be quality-assured. 40 C.F.R. § 58.16(a)-(c). At the time of Sierra Club's comments, the states had not yet submitted their annual certifications, but the Court can presume that if the data was required to be quality assured, it was.

This data was not actually newly acquired, although EPA tries to paint it as such. The states containing the fifteen counties generated the data and uploaded it into EPA's AQS. Nevertheless, if the Court were to consider it newly acquired information, it should find that EPA did not deal with it "in some reasonable fashion." *Catawba*, 571 F.3d at 45. EPA did not use the 2009-2011 monitoring

data in its decision to designate the fifteen counties attainment. Ignoring data showing that ten million people are exposed to unsafe ozone is not reasonable.

Ignoring this data is also unreasonable because for other NAAQS, EPA has used monitoring data that was not certified at the time EPA issued its original 120-day letters to let areas out of nonattainment. *See Catawba*, 571 F.3d at 28. However, for the 2008 ozone NAAQS, EPA refused to use the most recent data on its own, when Sierra Club submitted it with its comments and when Sierra Club submitted it a second time, certified at this point, with its petition for reconsideration. In doing so, EPA let states decide if EPA was to ignore "the best available information." *ATK*, 669 F.3d at 337 (quoting *Catawba*, 571 F.3d at 44). This, the Act does not permit. *Id.*

C. EPA's Excuses for Not Using the Most Recent Air Quality Data for the Fifteen Counties Are Not Rational

1. EPA's excuses in response to Sierra Club's comments are not rational

In its response to comments, EPA explained that states were not required to submit their certification that their previously-submitted, quality-assured ozone monitoring data was indeed complete until May 1, 2012. AR-0675 at 7 [JA-]. According to EPA, "such [certification] if submitted on May 1, 2012, would not be available in sufficient time for the EPA to complete the 120-day notice process required by the CAA prior to the EPA's deadline for designating areas pursuant to

a Consent Decree." *Id.* This is not true. EPA could have sent its 120-day recommendations by January 31, 2012 based on 2011 data, which was required to be submitted to EPA and quality assured before that date. Indeed, EPA sent the 120-day recommendation for Metro-Chicago on January 31, 2012. Then EPA could have confirmed the 2011 data when EPA got the certification letter on May 1, 2012. Indeed, EPA took action based on quality-assured data that had yet to be certified in this action and has done so in other designation actions as well. *See* 77 Fed. Reg. at 30,091; 77 Fed. Reg. 34,810, 34,813 (June 12, 2012).[7]

In the end, EPA failed to make nonattainment designations for the fifteen counties based on 2009-2011 data not because it was impossible to comply with the Act's procedural requirements, but rather because EPA gave states a choice of whether to use 2009-2011 data. This violated the Act when it resulted in EPA designating violating areas attainment.

2. EPA's excuses in response to Sierra Club's petition for reconsideration are not rational

On July 20, 2012, Sierra Club submitted an administrative petition for reconsideration of EPA's refusal to designate the fifteen counties nonattainment, despite the 2009-2011 data showing these counties violate the NAAQS. AR-0712

[7] Actually, if the 2009-2011 data was truly new "data," EPA would not even need to send a new 120-day letter to use it in its final designations according to *Catawba*, 571 F.3d at 51-52, as it would represent a "change in data."

[JA-]. At this point, EPA's excuse that the data was not certified and not having enough time to send states a 120-day letter had fallen by the wayside. AR-0716 at 1 [JA-] (admitting that 2009-11 air-quality data was "now-certified").

Despite this fact, EPA reasserted its claims, rebutted above, that it could not have issued 120-day letters and met the consent decree deadline if it used 2009-2011 data. *Id.* Enclosure at 2. EPA also claimed that it does not use uncertified air quality data for designations, despite the fact that it admitted it relied on uncertified data in this rulemaking for certain states and other examples of that approach cited above. *Id.* at 2 n.1.

EPA also claims that the appropriate process for dealing with the 2009-2011 data is the redesignation process in 42 U.S.C. § 7407(d)(3). AR-0716, Enclosure at 2. EPA's excuse rings hollow given that it takes the position that once it has designated an area attainment, the agency has no obligation to subsequently redesignate to nonattainment, even if the area is violating the standard. *See, e.g.,* 71 Fed. Reg. 61,236, 61,240 (2006) ("EPA has no legal obligation to redesignate an area even if a monitor should register a violation of that standard"). Indeed, more than a year has passed since EPA failed to designate the fifteen counties nonattainment, but EPA has not started the redesignation process. As this Court has admonished, EPA cannot "promise to do tomorrow what the Act requires today." *Sierra Club v. EPA*, 356 F.3d 296, 298 (D.C. Cir. 2004).

EPA goes on to say that new technical data becomes available on a regular basis so granting petitions for reconsideration based on new data would result in a "never-ending process." AR-0716 Enclosure at 2 [JA-]. This argument goes too far as it would eliminate petitions for reconsideration, which must be based on new information. *See* 42 U.S.C. § 7607(d)(7)(B). Moreover, factually, the 2009-2011 data was not new. EPA had the quality-assured 2009-2011 data more than six months prior to making its final decision. As explained above, in this designation process and others, EPA has relied on uncertified, but quality-assured data during the process so long as the states will certified the data before EPA takes final action. Plus, the certification happens once a year on a predictable schedule so this is not a case of new data repeatedly and unexpectedly interjecting into the process.

Finally, EPA claims that if it granted the petition, EPA would finish the reconsideration process around the same time the 2012 data would be certified and thus EPA "could receive a further petition to then consider air quality data from 2010-2012." AR-0716 Enclosure at 3 [JA-]. EPA's alleged preferred mechanism for dealing with this situation, Section 107(d)(3), would face the exact same challenge. Moreover, at the time it issued this decision, EPA had the data showing that fourteen of the fifteen counties were still violating the 2008 ozone NAAQS in 2010-2012.[8] Ultimately, EPA's response fails because ambient pollution levels do

[8] *See* http://www.epa.gov/airtrends/values.html, at Table 2.

change. The Act does not let EPA allow people to remain unprotected if these changes are for the worse.

II. EPA'S Failure to Designate the Uinta Basin Nonattainment Violates the CAA and is Arbitrary

A. EPA's Refusal to Rely on Sound, Available Data Is Inconsistent with the CAA

The CAA's plain language, legislative history, and purpose demonstrate that Congress intended EPA to rely on sound, available data to make NAAQS designations. The Act defines "nonattainment" as "any area that does not meet . . . the [NAAQS]." 42 U.S.C. § 7407(d)(1)(A)(i). An unclassifiable area is defined as an area that "*cannot* be classified on the basis of *available information* as meeting or not meeting the [NAAQS]." *Id.* § 7407(d)(1)(A)(iii) (emphasis added). Under the plain language of the Act, EPA may only designate an area unclassifiable if it cannot determine on the basis of available information whether an area meets the NAAQS. *See New York v. EPA*, 443 F.3d 880, 885, 887 (D.C. Cir. 2006) (adopting the "common meaning" of words used in the CAA). [9]

[9] For example, EPA would be unable to determine if an area was meeting the NAAQS if there was no ambient air quality data available. *See Bethlehem Steel Corp. v. EPA*, 723 F.2d 1303, 1307 (7th Cir. 1983) (stating that "the only situation in which designation of an area as unclassifiable would be proper" is "if [] data [does] not exist.").

The legislative history to the 1990 Amendments confirms that "available information" includes any "*sound data that is available*, preferably air quality monitoring data, but in some cases where appropriate and necessary, the Agency may rely on modeling or on statistical extrapolation from monitored concentrations of another pollutant." S. Rep. No. 101-228, at 15 (1989), *reprinted in* 1990 U.S.C.C.A.N. 3385, 3401 (emphasis added); *see also Montana Sulphur & Chemical Co. v. EPA*, 666 F.3d 1174, 1185 (9th Cir. 2012) (recognizing "the legislative history underlying the 1990 amendment clarifies that the EPA may rely on any 'sound data' that is available" to determine nonattainment). Congress was not only clear that EPA should use all sound monitoring data available to the agency, but also that EPA could rely on other techniques, like modeling, that produced sound data.

Here, EPA's own actions ensured that there is sound monitoring data available. EPA required installation of multiple monitors in the Uinta Basin and ensured those monitors would meet the substantive standards of Part 58, including reasonable quality assurance. *See supra* at 9-10. EPA concedes the data collected is sound, that both monitors' design values exceed the NAAQS, and that the high ozone levels are a "concern for public health." *See supra* at 11-12. EPA's designation of the Uinta Basin as unclassifiable in the face of this undisputed

evidence violates the plain language of the Act and flies in the face of Congress' intent.[10]

EPA's refusal to rely on sound, available data further conflicts with Congress' overriding goal in requiring compliance with NAAQS: protecting public health. 42 U.S.C. §§ 7407(d)(1)(B)(i), 7409(b); *see also Am. Lung Ass'n v. EPA*, 134 F.3d 388, 389 (D.C. Cir. 1998) (affirming the Act takes a "preventative" and "precautionary" approach). Congress strengthened the area designation process in 1990 to provide EPA with "significant authority" to "respond to new information about pollution levels" in response to concerns that 150 million people were still living in areas that exceeded one or both of the ozone and carbon monoxide NAAQS. 1990 U.S.C.C.A.N. 3397, 3400. This Court has cautioned against interpreting the Act in a way that "would produce a "'strange' if not 'indeterminate,' result." *New York*, 443 F.3d at 886 (rejecting EPA interpretation because it would mean "a law intended to limit increases in air pollution would allow sources . . . to increase significantly the pollution they emit without government review"). Allowing EPA to avoid a nonattainment designation where

[10] EPA argues that the regulatory monitoring requirement "derives" from Section 319, which authorizes EPA to establish a nationwide air quality monitoring system. 42 U.S.C. § 7619; *see* AR-0751 Enclosure at 2 [JA-]. But nothing in Section 319 mandates that EPA rely solely on state-collected Part 58 monitoring data to make NAAQS designations. 42 U.S.C. § 7619. Section 319 says nothing about NAAQS designations.

sound data demonstrates that people are suffering some of the country's worst air pollution would be a similarly "strange" result that defeats Congress' intent.

B. EPA Offers No Rational Explanation for Refusing to Rely on the Redwash and Ouray Data

EPA cannot rationally have it both ways with respect to the Redwash and Ouray monitors. One the one hand, EPA concedes that the data is reliable and the monitors meet the substantive requirements of Part 58, including reasonable quality assurance. *See supra* at 10-12. EPA has urged other federal agencies to rely on the data. *See supra* at 11-12. In fact, EPA admits that it relied on the data in this rulemaking. *See* AR-0751 Enclosure at 2 [JA-] ("EPA did not disregard the non-regulatory data from the Uinta Basin; in fact, the data are the reason the EPA designated the Uinta Basin of Utah as unclassifiable."). On the other hand, EPA claims that it cannot use the data to support a nonattainment designation. EPA provides no rational explanation as to why the data is sound and may be used for one purpose, but not another. *See Cnty. of Los Angeles v. Shalala*, 192 F.3d 1005, 1022 (D.C. Cir. 1999) (rejecting agency decision as arbitrary because "the Secretary ha[d] inadequately explained why the 1984 data were suitable for one significant calculation but unreliable for another").

EPA offers three excuses for not relying on the monitoring data: (1) the consent decrees do not provide the same level of EPA oversight as Part 58, (2) EPA failed to approve the monitors' quality assurance plan, and (3) reports of

quality control checks in EPA's AQS are not complete. None of these justifications provides a rational basis for EPA's decision.

First, EPA objects that the consent decrees do not provide the same level of EPA oversight as that "inherent" in Part 58. *See* AR-0675 at 73 [JA-] (arguing that there is no mechanism "authorizing regulatory agencies to direct corrective actions should quality assurance issues be identified"). There is no support for this claim. EPA has ample authority under the consent decrees to oversee the monitoring operations and ensure they produce sound data.

The consent decrees require the operators to provide EPA substantial information regarding the monitoring operations, including the recorded data and an annual report describing all work and other activities performed under the decree. *See* AR-0711 App. 180-81, 278-79. EPA may use any of this information to enforce the decrees. *See id.* App. 182-83, 228, 280. EPA also has authority to enter any facility covered by the decrees for the purpose of monitoring compliance and inspecting equipment. *Id.* App. 198-99, 237, 290. Moreover, because the courts that approved the consent decrees retain jurisdiction to enforce them, EPA can direct corrective action through a contempt proceeding. *See id.* App. 207, 243, 297; Fed. R. Civ. P. 70(e); *Local No. 93, Int'l Ass'n of Firefighters v. Cleveland*, 478 U.S. 501, 518 (1986).

Second, EPA objects that it never approved the quality assurance plan provided by the private contractor. AR-0675 at 72-73 [JA-]. EPA admits that the private contractor developed a quality assurance plan that was "reasonably calculated" to meet the requirements of Part 58, but that EPA never approved the plan. *Id.* Other than the alleged oversight deficiency, EPA has not identified any problems with the plan. AR-0751 Enclosure at 3 [JA-] (arguing that the quality assurance plan prepared for the monitors is "not complete enough," but providing no details with respect to what is missing). Lack of plan approval, standing alone, does not indicate that the data is flawed. There is also no evidence that EPA attempted to resolve any perceived deficiencies with the private contractor—even after EPA realized the monitors were recording pollution at levels that pose a serious threat to public health.

Third, EPA objects that its AQS records for the monitors are incomplete. States must report their monitoring data to AQS along with evidence of bi-weekly quality control checks and annual independent audits. 40 C.F.R. § 58 App. A §§ 3.2.1, 3.2.2. Although not required by Part 58 or the consent decrees, the Redwash and Ouray monitoring data has also been reported in AQS. According to EPA, AQS contains evidence of bi-weekly quality checks for the monitors between August 2009 and January 2010, but not thereafter, and no evidence of yearly audits. AR-0751 Enclosure at 4 [JA-]. Regardless of what is in AQS, EPA offers

no evidence that the private contractors were not conducting sufficient quality control checks. In fact, EPA concedes the data substantially complied with its quality assurance requirements. Moreover, numerous other sources confirmed that ozone levels substantially exceeded the NAAQS during the time period in which EPA claims reported records are lacking. *See supra* at 11.

Finally, EPA's rejection of the private Redwash and Ouray monitoring data conflicts with how EPA assesses whether state monitoring data is sufficient for NAAQS designations. *See Catawba*, 561 F.3d at 51-52 ("[I]nconsistent treatment is the hallmark of arbitrary agency action."); *Cnty. of Los Angeles*, 192 F.3d at 1022 ("A long line of precedent has established that an agency action is arbitrary when the agency offers insufficient reasons for treating similar situations differently.") (quotation omitted). Just one month after the final designations, EPA recognized that "while it is essential to require a minimum set of checks and procedures in appendix A to support the successful implementation of a quality system, the success or failure of any one check or series of checks does not preclude the EPA from determining that data are of acceptable quality to be used for regulatory decision-making purposes." 77 Fed. Reg. 38,890, 39,014 (June 29, 2012). Accordingly, EPA revised Part 58 to "clarify" that EPA could decide whether to use monitoring data based on "data quality" and "overall compliance" with Appendix A. 40 C.F.R. § 58, App. A § 1(b).

Here, EPA concedes data quality as well as overall compliance with Appendix A but still arbitrarily refused to rely on the data to make a nonattainment designation. This Court should reject EPA's attempt to tie its own hands in the face of an undeniable threat to public health.

CONCLUSION

For the foregoing reasons, Petitioners request that this Court reverse EPA's attainment designation for the fifteen counties and EPA's unclassifiable designation for the Uinta Basin with instructions to designate these areas nonattainment.

DATED: September 17, 2013

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

1. This brief complies with the type-volume limitation of Fed. R. App. P. 32(a)(7)(B) because:

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Date: September 17, 2013

s/ Robin L. Cooley

Counsel for WildEarth Guardians, Southern Utah Wilderness Alliance, and Utah Physicians for a Healthy Environment

CERTIFICATE OF SERVICE

I certify that on September 17, 2013, I served the foregoing **ENVIRONMENTAL PETITIONERS' JOINT OPENING BRIEF** on all registered counsel through the Court's electronic filing system (ECF).

s/ Robin L. Cooley
Robin L. Cooley

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EXHIBIT 1

Declaration of Analida H. Ingraham

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB Petitioner, v UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*, Respondents.	**DECLARATION OF ANALIDA H. INGRAHAM IN SUPPORT OF JOINT PETITIONER'S BRIEF** Case No. 12-1317 (consolidated with No.12-1309 *et al.*)

I, Analida H. Ingraham declare as follows:

1 My name is Analida H. Ingraham. I am over 18 years of age. The information in this declaration is based on my personal knowledge and my review of publicly available information in government record. If called to testify, I would testify as to the facts stated in this declaration.

2. I live in Jefferson County, Texas. I have lived at my current address for over five years and in Jefferson County for over 15 years. I live here with my husband and three children.

3. I am a stay-at-home mom and a Girl Scout volunteer

4. I am a dues paying member of the Sierra Club. I have been a member continuously since 2000. I joined the Sierra Club because I am of the opinion that we humans are destroying the planet, and I want to help an organization that raises awareness and fights the biggest threats to the environment and wildlife. I think that one of the biggest threats to the environment is climate change since it affects many different aspects of our life on earth. I believe that we share this earth with every other life form, and it is our responsibility to take care of it. Eventually, the damage to our environment will translate to damage to our lifestyle and economy, but by the time that happens we will have lost precious time needed to save the planet. I am also concerned with air and water quality and, right now, I am very worried about the health of bees because of their important role as pollinators.

5. I spend time outside with my three children—ages one, three, and eleven—almost daily As a family we enjoy our backyard toys and swing set daily, as well as walks through our neighborhood and local parks. We also spend time outside walking our dog. In addition, as a Girl Scout volunteer, I have spent time with my troop enjoying the outdoors and learning about the environment and conservation, an important part of our Girl Scout activities. I will continue

to spend time doing outdoor activities with my family and my Girl Scout troop on a regular basis in the future.

6. I have had asthma problems on and off for about 18 years. My asthma has gotten worse in the last few years, and I have been prescribed both a daily and rescue inhaler to treat my symptoms.

7 My husband has allergies and reoccurring nasal polyps which makes breathing difficult for him. These polyps require aggressive treatment with steroids and other medications. I am worried about him having to take several courses of these drugs to control the growth of polyps. I am also worried about the causes of this problem, since it is recurrent.

8. My three year old daughter was hospitalized for respiratory distress in July 2012. She was on medication for a year, delivered by daily nebulizer treatments at home. She was also prescribed rescue medication. She was on medication since being hospitalized last year, but I am trying to wean her off of it because I am worried about her being on medication during such important growth and development years. At the same time, I am worried about my daughter ending up in the hospital again because of her respiratory issues, so I have to keep a close eye on her health.

9 I am frustrated that I live in an area with excessive air pollution, and that not enough is being done to remedy that pollution. I am concerned about the health impacts on myself and my family, especially my three year old daughter due to her young age and existing respiratory issues.

10. I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

11 I understand that EPA designated Jefferson County an area that was in attainment for the 2008 ground level ozone pollution standard.

12. I understand that EPA has determined, based on scientific evidence, that exposure to ground level ozone pollution causes numerous human respiratory problems, including decreased lung function, asthma, bronchitis, emphysema, and inflammation of the lining of the lungs. I understand that children, people with lung disease, older adults, and people who are active outdoors may be particularly sensitive to ozone's effects.

13. I understand that Sierra Club is now suing EPA to force the agency to designate Jefferson County as a nonattainment area. I support the Sierra Club lawsuit. If EPA determines that Jefferson County is in nonattainment, my family and I will benefit from the resulting reductions in ozone pollution that will be required. If, however, EPA fails to designate our area as nonattainment, we will not receive these benefits and we will continue to be harmed by ozone pollution.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed September 12, 2013.

Analida H. Ingraham

EXHIBIT 2

Declaration of Barbara Vanhanken

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB

Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,

Respondents.

DECLARATION OF BARBARA VANHANKEN IN SUPPORT OF **JOINT PETITIONER'S BRIEF**

Case No. 12-1317
(consolidated with
No.12-1309 *et al.*)

I, Barbara VanHanken declare as follows:

1. My name is Barbara VanHanken. I am over 18 years of age. The information in this declaration is based on my personal knowledge and my review of publicly available information in government record. If called to testify, I would testify as to the facts stated in this declaration.

2. I live in Tulsa, Oklahoma. I have lived at my current address for 34 years. I live here with my husband.

3. I am retired, but am very active as a community activist; I have been for a very long time. Some of the organizations I am involved with include the League of Women Voters Of Metropolitan Tulsa, Tulsa Master Recyclers Association, and Clean Energy Future OK—an organization which I helped form.

4. I am a dues paying member of the Sierra Club. I originally joined the Sierra Club in 1981 and have been a member continuously since 1993. In the past, I attended a few local Sierra Club chapter meetings, and I am a current board member of the Oklahoma Sierra Club. I joined the Sierra Club because I am an environmentalist and because I support activities that help to move us beyond our reliance on fossil fuels. I am very concerned with clean air and water, as well as fracking and the tar sands pipeline issues. I am disgusted by what is happening to the natural resources in my state.

5. I enjoy being outdoors. I enjoy daily walks, sometimes in the nearby park along the Arkansas River. I also enjoy gardening and working in the yard a couple times a week. My husband and I also travel to nearby Norman, Oklahoma for football at the University of Oklahoma and local outdoor baseball games. I maintain an active lifestyle and will continue to do these activities on a regular basis in the future so long as I am physically capable.

6. I have been diagnosed with asthma and have been prescribed both a daily inhaler as well as a rescue inhaler by a doctor. I also take several other medications due to my respiratory problems. I have been treated for these respiratory issues for over ten years. Outdoor activities, such as my daily walks, exacerbate my breathing problems.

7. I am frustrated that I live in an area with excessive air pollution, and that not enough is being done to remedy that pollution. As a senior citizen with asthma and respiratory issues, I am concerned about the impacts to my health from ozone pollution. I am also concerned with the health of my elderly husband. My husband had cancer about ten years ago, and one of the things we were told by the doctors during the treatment process was to spend as much time outdoors as possible. We took those instructions to heart—sitting outside as much as we could, even eating our meals outside. We continue to spend a lot of time outside, and I am concerned about the quality of air we are breathing. I am also very concerned with the impact ozone pollution in my area is having on the health of my grandchildren—ages nine, ten, and twelve—who also live in Tulsa. I am especially worried about their health because they are still growing and poor air quality at this stage of their development will impact their health for the rest of their lives.

8. I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

9. I understand that EPA designated Tulsa an area that was in attainment for the 2008 ground level ozone pollution standard.

10. I understand that EPA has determined, based on scientific evidence, that exposure to ground level ozone pollution causes numerous human respiratory problems, including decreased lung function, asthma, bronchitis, emphysema, and inflammation of the lining of the lungs. I

understand that older adults, children, people with lung disease, and people who are active outdoors, such as myself, may be particularly sensitive to ozone's effects.

11. I understand that Sierra Club is now suing EPA to force the agency to designate Tulsa as a nonattainment area. I support the Sierra Club lawsuit. If EPA determines that Tulsa is in nonattainment, my husband, grandchildren, and I will benefit from the resulting reductions in ozone pollution that will be required. I would also be sure to educate Sierra Club members and the public about the nonattainment status of my area so that they can protect themselves; everyone has the right to know what health impacts the air they are breathing can have on them. If, however, EPA fails to designate our area as nonattainment, we will not receive these benefits and we will continue to be harmed by ozone pollution.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed September 12, 2013.

Barbara VanHanken

EXHIBIT 3

Declaration of Beth Young

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB

Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,

Respondents.

DECLARATION OF BETH YOUNG IN SUPPORT OF JOINT PETITIONER'S BRIEF

Case No. 12-1317
(consolidated with
No.12-1309 *et al.*)

I, Beth Young, do declare as follows:

1. My name is Beth Young. I am over 18 years of age. The information in this declaration is based on my personal knowledge or public information in government records and, if called to testify, I would testify as to the facts stated in this declaration.

2. I have been a continuous Sierra Club Member since October 2000.

3. I live in Dayton, Ohio and I have lived at this address within Montgomery County for the past 5 years.

4. I enjoy gardening outside, and I also enjoy running, power walking or biking outside every day and I will continue to do so as long as I am physically capable.

5. Since I have moved to Montgomery County, I have been admitted to the emergency room on two separate occasions because of the poor air quality. On both occasions, I was diagnosed as having deep respiratory infections caused by the air pollution. I now have to take a regimen of decongestants (pseudoephedrine) and anti-inflammatory medication every day, just to breathe. When I engage in my daily outdoor activities, I have to take more of these medications so I can breathe. I never experienced any respiratory illnesses until I moved to Montgomery County nor have I ever taken any medication to breathe until now.

6. I am a library teacher at an elementary school, ranging from preschool to 3rd grade, and the nurse has told me that there has been a significant increase in children coming to her for breathing ailments or allergies. I am concerned about the air quality in my county for not only my own health, but for the health of my young students.

7. I am frustrated that I live in an area with excessive air pollution that is harming my quality of life, and that not enough is being done to remedy that pollution.

8. I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

10. I understand that EPA designated Montgomery County an area that was in attainment for the 2008 ground level ozone pollution standard.

9. I understand that EPA has determined, based on scientific evidence, that exposure to ground level ozone pollution causes numerous human respiratory problems, including decreased lung function, asthma, bronchitis, emphysema and can inflame the lining of the lungs. I have also read that repeated exposure can lead to permanent scarring of the lungs. I understand that people with lung disease, children, older adults, and people who are actively outdoors, such as myself, may be particularly sensitive to ozone's effects.

10. I understand that Sierra Club is now suing EPA to force the agency to designate Montgomery County, OH as a nonattainment area. I support the Sierra Club lawsuit. If EPA determined that Montgomery County is in non-attainment, I will benefit from the resulting reductions in ozone pollution that will be required in terms of my health and quality of life. If, however, EPA fails to designate Montgomery County as nonattainment, I will not receive these benefits and will continue to be harmed by ozone pollution in my area.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 11, 2013.

Mary Beth Young
Beth Young

EXHIBIT 4

Declaration of James E. Zipperer

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB

Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,

Respondents.

DECLARATION OF JAMES E. ZIPPERER IN SUPPORT OF JOINT PETITIONER'S BRIEF

Case No. 12-1317
(consolidated with
No.12-1309 *et al.*)

I, James E. Zipperer declare as follows:

1. My name is James E. Zipperer. I am over 18 years of age. The information in this declaration is based on my personal knowledge and my review of publicly available information in government record. If called to testify, I would testify as to the facts stated in this declaration.

2. I live in Manitowoc County, Wisconsin. I have lived at my current address for 35 years. I live here with my wife, Joanne M. Zipperer.

3. My wife and I are retired.

4. I am a dues paying member of the Sierra Club. I have been a member continuously since 2006. I joined the Sierra Club because my wife and I support Sierra Club's goals. We are concerned about the planet, and we have seen the positive effect of Sierra Club's work. We also like the fact that Sierra Club litigates issues rather than just lobbying for its cause.

5. My wife and I very much enjoy being outdoors. We enjoy taking care of our property, which includes daily yard work. We also garden daily in our large vegetable garden. These activities are very important to us, and we will continue doing them on a regular basis in the future as long as we are physically capable. Being active outside on our property and in parks around our area is very important to us.

6. I had a stroke in 2004. I had heart surgery in 2005 and now have two artificial heart valves. Since the stroke, I have been on blood thinners and cholesterol and blood pressure medications. I also had pneumonia in 2008 and had to have an operation to reinflate part of my left lung. Being outdoors on days when the air is heavy with pollution and high humidity negatively affects my health and impacts my ability to be outdoors and do things such as yard work and gardening. My wife and I can feel the health effects when the air is bad.

7. I am frustrated that I live in an area with excessive air pollution and that not enough is being done to remedy that pollution. I am concerned about the health impacts on myself and my wife, as well as on three of our elderly sisters who also live in Manitowoc County. On bad days, you can see the pollution on the horizon; the sky is gray and yellow. There are a number of coal-fired power plants around the immediate area, as well as other large sources of pollution, and we worry about the health impact of air pollution from those facilities.

8. I understand that, in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

9. I understand that EPA designated Manitowoc County an area that was in attainment for the 2008 ground-level ozone pollution standard.

10. I understand that EPA has determined, based on scientific evidence, that exposure to ground-level ozone pollution causes numerous human respiratory problems, including decreased lung function, asthma, bronchitis, emphysema, and inflammation of the lining of the lungs, and that older adults, children, people with lung disease, and people who are active outdoors may be particularly sensitive to ozone's effects. I also understand that the stress placed on the cardiovascular system from ozone pollution, especially in elderly people, those on medication, and those with heart or weight issues, can affect heart health and may trigger heart attacks and strokes.

11. I understand that Sierra Club is now suing EPA to force the agency to designate Manitowoc County as a nonattainment area. I support the Sierra Club lawsuit. If EPA determines that Manitowoc County is in nonattainment, my wife and I will benefit from the resulting reductions in ozone pollution that will be required. If, however, EPA fails to designate our area

as nonattainment, we will not receive these benefits and we will continue to be harmed by ozone pollution.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed September 11, 2013.

James E. Zipperer

EXHIBIT 5

Declaration of Jo Ellen Gramling

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB

Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,

Respondents.

DECLARATION OF JO ELLEN GRAMLING IN SUPPORT OF JOINT PETITIONER'S BRIEF

Case No. 12-1317
(consolidated with
No.12-1309 *et al.*)

I, Jo Ellen Gramling, declare as follows:

1. My name is Jo Ellen Gramling. I am over 18 years of age. The information in this declaration is based on my personal knowledge and my review of publicly available information in government record. If called to testify, I would testify as to the facts stated in this declaration.

2. I live in Manitowoc County, Wisconsin. I have lived at my current address for 33 years. I live here with my husband and son.

3. I am a semi-retired accountant.

4. I am a dues paying member of the Sierra Club. I originally joined the Sierra Club in 2003 and have been a member continuously since 2011. I joined the Sierra Club because I have been concerned with the protection of the environment for a very long time, and I felt that the Sierra Club is the most effective environmental organization for protecting our air and water resources.

5. I enjoy being outdoors. I bike and camp in the warmer months and cross country ski in the winter. I generally enjoy these activities on a weekly or monthly basis. I also enjoy walking my dog. My husband walks our dog daily, two times a day on most days, and I usually join him once a week. I plan to continue these activities on a regular basis in the future as long as I am physically capable.

6. I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

7. I understand that EPA designated Manitowoc County an area that was in attainment for the 2008 ground level ozone pollution standard.

8. I understand that EPA has determined, based on scientific evidence, that exposure to ground level ozone pollution causes numerous human respiratory problems, including decreased

lung function, asthma, bronchitis, emphysema, and inflammation of the lining of the lungs. I understand that older adults, children, people with lung disease, and people who are active outdoors, such as myself, may be particularly sensitive to ozone's effects. For instance, my elderly mother, who was a widow and lived in nearby Sheboygan County along the lakeshore, used to have breathing issues. Some days she would tell me that she did not want to go outside or open the windows, saying that "the air is bad today." I remember a short time after she passed away there were articles in the news about local ozone pollution, and I realized that all along she had been right.

9. I am concerned about the health impacts on myself and my family from ozone pollution in Manitowoc County. I am especially concerned about my husband's health since he commutes to and works in Manitowoc City.

10. I understand that Sierra Club is now suing EPA to force the agency to designate Manitowoc County as a nonattainment area. I support the Sierra Club lawsuit. If EPA determines that Manitowoc County is in nonattainment, my husband and I will benefit from the resulting reductions in ozone pollution that will be required. If, however, EPA fails to designate our area as nonattainment, we will not receive these benefits and we will continue to be harmed by ozone pollution.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed September 10, 2013.

Jo Ellen Gramling

EXHIBIT 6

Declaration of Kent W. Nicholls

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB

Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,

Respondents.

DECLARATION OF KENT W. NICHOLLS IN SUPPORT OF JOINT PETITIONER'S BRIEF

Case No. 12-1317
(consolidated with
No.12-1309 *et al.*)

I, Kent W. Nicholls do declare as follows:

1. My name is Kent W. Nicholls. I am over 18 years of age. The information in this declaration is based on my personal knowledge or public information in government records and, if called to testify, I would testify as to the facts stated in this declaration.

2. I have been a continuous member of the Sierra Club since May 2011, and first joined in January 1999.

3. I live in Clinton County, Missouri. My address is 1209 Aerie Lane, Cameron, Missouri 64429. I have lived at this address for 4 years.

4. I joined Sierra Club because I was concerned about environmental issues generally and was involved with other national organizations, but wanted a group where I could participate on a more local level. I am specifically concerned with coal-fired power plants in Missouri and other local energy production- related issues. I also have participated in the Sierra Club's outdoor initiatives involving backpacking training.

5. I enjoy regularly hiking, backpacking, and bicycling. I engage in these activities primarily at my home or in areas throughout Clinton County, particularly in Wallace State Park. I generally participate in these activities on a monthly basis and I intend to continue to doing so on a regular basis in the future as long as I am physically able to do so.

9. I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

10. I understand that Clinton County was deemed an area that was in attainment for the 2008 ground level ozone pollution standard.

11. I understand that EPA has determined, based on scientific evidence, that exposure to ground level ozone pollution causes numerous human respiratory problems, including decreased

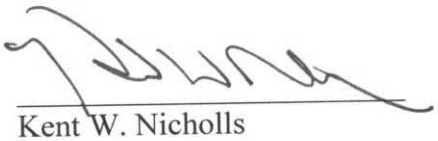
lung function, asthma, bronchitis, emphysema and can inflame the lining of the lungs. I have also read that repeated exposure can lead to permanent scarring of the lungs. I understand that people who are active outdoors, children, older adults, and people with lung disease are particularly sensitive to ozone's effects.

13. If EPA designated Clinton County as a nonattainment area, restrictions would be imposed that would reduce the amount of pollution in the air I breathe. This will make it safer for me to pursue the outdoor activities described above, which I enjoy and will continue to pursue.

15. I am participating in the case because I would like to see EPA address Missouri's ozone levels and to take steps to improve air quality for individuals like myself who live in counties that fail to meet the national ambient air quality standards.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 10, 2013.



Kent W. Nicholls

EXHIBIT 7

Declaration of Martha A. Holland

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB

Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,

Respondents.

DECLARATION OF MARTHA A. HOLLAND IN SUPPORT OF JOINT PETITIONER'S BRIEF

Case No. 12-1317
(consolidated with
No.12-1309 *et al.*)

I, Martha A. Holland declare as follows:

1. My name is Martha A. Holland. I am over 18 years of age. The information in this declaration is based on my personal knowledge and my review of publicly available information in government record. If called to testify, I would testify as to the facts stated in this declaration.

2. I live in Oklahoma City, Oklahoma. I have lived at my current address for 11 years.

3. I am a job coach.

4. I am a dues paying member of the Sierra Club. I have been a member continuously since 2000. I joined the Sierra Club because I have cared about the environment since I was a teenager, and because everything the Sierra Club represents is important to me. I am concerned with having clean air to breathe and clean water to drink, and I believe we need to be good stewards of the planet. Currently, I serve as a volunteer for Sierra Club's Beyond Coal Campaign, helping the organization plan different events and attending monthly organizing meetings.

5. I have always enjoyed being outdoors. I used to walk and camp all the time. I also used to do a lot of yard work. However, I was recently diagnosed with chronic obstructive pulmonary disease ("COPD") and have had to limit my outdoor activities because the air quality is my area is so bad. I also have been on oxygen at night since last December. Outdoor activities like walking and yard work exacerbate my COPD. Last year I had to quit doing my yard work because I am afraid of the affects that the poor air quality in my area will have on my health when combined with my COPD. Now I no longer receive the exercise benefits and positive health impacts from doing my own yard work, and I am forced to pay someone else to do it for me.

6. In general, I am really impaired from doing things because of the air quality in my area. I really have to watch it and not do anything on ozone days. I am on a ton of medication, including inhalers, to help with my respiratory issues and COPD. I also have a handicap sticker because I cannot walk far distances without feeling the effect on my breathing.

7. I am frustrated that I live in an area with excessive air pollution and that not enough is being done to remedy that pollution. I am concerned about the impacts to my health, especially because I suffer from COPD. I have already felt negative impacts from the poor air quality in my area. For instance, after spending a few hours outside of a coal-fired power plant during a recent Sierra Club organizing event, I felt horrible; my throat was really, really scratchy, and I could just feel the effects on my breathing ability. I also recently attended a friend's outdoor Labor Day picnic in the country for two hours, and the next morning my nose was crusty and I was coughing up stuff. I also had to take off of work for a half day the next day because I was having a hard time breathing. I am concerned about the impact of ozone pollution on my health. I am also concerned with the impact of ozone pollution on my brother's health. He lives right outside Oklahoma City and has stage 4 lung cancer.

8. I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

9. I understand that EPA designated Oklahoma City an area that was in attainment for the 2008 ground level ozone pollution standard.

10. I understand that EPA has determined, based on scientific evidence, that exposure to ground level ozone pollution causes numerous human respiratory problems, including decreased lung function, asthma, bronchitis, emphysema, and inflammation of the lining of the lungs. I

understand that older adults, children, people who are active outdoors, and people with lung disease, such as myself, may be particularly sensitive to ozone's effects.

11. I understand that Sierra Club is now suing EPA to force the agency to designate Oklahoma City as a nonattainment area. I support the Sierra Club lawsuit. If EPA determines that Oklahoma City is in nonattainment, I will benefit from the resulting reductions in ozone pollution that will be required. If, however, EPA fails to designate our area as nonattainment, we will not receive these benefits and we will continue to be harmed by ozone pollution.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed September 10th, 2013.

Martha A. Holland

Martha A. Holland

EXHIBIT 8

Declaration of William M. Harris

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*, Respondents.	**DECLARATION OF WILLIAM M. HARRIS IN SUPPORT OF JOINT PETITIONER'S BRIEF** Case No. 12-1317 (consolidated with No.12-1309 *et al.*)

I, William M. Harris, Jr. declare as follows:

1. My name is William M. Harris, Jr. I am over 18 years of age. The information in this declaration is based on my personal knowledge and my review of publicly available information in government record. If called to testify, I would testify as to the facts stated in this declaration.

2. I live in Bossier City, Louisiana. I have lived at my current address for four years and have lived in Bossier for about seven.

3. I am a graduate student and a musician.

4. I am a dues paying member of the Sierra Club. I originally joined the Sierra Club in 2006 and have been a member continuously since 2012. I joined the Sierra Club because I care about air quality, water quality, and environmental conservation.

5. I enjoy being outdoors. I travel a lot for my job which means I have to spend a good deal of time outside. I enjoy walking, however, I mostly use a treadmill for a number of reasons, one of them being my concern about outdoor air quality. I also enjoy camping in Lake Bistineau State Park a couple times a year during the warmer months. I will continue these activities in the future.

6. I am frustrated that I live in an area with excessive air pollution, and that not enough is being done to remedy that pollution. I am concerned about the negative impacts on my health from ozone pollution.

7. I understand that EPA has determined, based on scientific evidence, that the stress placed on the cardiovascular system from ozone pollution, especially in those with weight issues, such as myself, those on medication, individuals with heart issues, and elderly people, can affect heart health and may trigger heart attacks and strokes. I also understand that exposure to ground-level

ozone pollution causes numerous human respiratory problems, including decreased lung function, asthma, bronchitis, emphysema, and inflammation of the lining of the lungs.

8. I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

9. I understand that EPA designated Bossier Parish as an area that was in attainment for the 2008 ground level ozone pollution standard.

10. I understand that Sierra Club is now suing EPA to force the agency to designate Bossier Parrish as a nonattainment area. I support the Bossier Parish is in nonattainment, I will benefit from the resulting reductions in ozone pollution that will be required. If, however, EPA fails to designate my area as nonattainment, I will not receive these benefits and I will continue to be harmed by ozone pollution.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed September ___15th__, 2013.

William M. Harris, Jr.

EXHIBIT 9

Declaration of Elizabeth Bennett

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al*., Respondents.	**DECLARATION OF ELIZABETH BENNETT IN SUPPORT OF JOINT PETITIONER'S BRIEF** Case No. 12-1317 (consolidated with No.12-1309 *et al.*)

I, Elizabeth Rudd Bennett do declare as follows:

1. My name is Elizabeth Rudd Bennett. I am over 18 years of age. The information in this declaration is based on my personal knowledge or public information in government records and, if called to testify, I would testify as to the facts stated in this declaration.

2. I have been a continuous Sierra Club Member since 1983. For the past 6 years, I have served as Conservation Chair for the Cumberland Chapter of the Sierra Club. In that position I am responsible for coordinating all the conservation committees in the state of Kentucky. Other responsibilities include: outreach to members to encourage involvement in our campaigns, drafting letters to government agencies, reviewing air and water permits, submitting comments on permits and I also attend many public hearings. I have also previously held the position of Chapter Chair and Newsletter Editor for the Cumberland Chapter.

3. I live in Jefferson County, Kentucky. My current address is 1 Wolf Pen Lane, Prospect, KY 40059. I have lived at this address for that past 2 years and have lived in Jefferson County for the past 15 years.

4. I enjoy regularly gardening, and taking zoo trips with my four small grandchildren. I also enjoy hiking in parks with my friends. I engage in these activities primarily at or near my home in Jefferson County. Because I live on a small farm, I generally enjoy these activities every day and I will continue doing so on a regular basis in the future as long as I am physically capable to do so.

5. I am also a Board Member of the Louisville/Olmstead Parks Conservancy group. I regularly attend meetings and hiking events with the group in parks in Jefferson County, including Cherokee Park and Seneca Park.

6. For much of my life I have struggled with asthma which has been exacerbated during the times I have lived in the Louisville, Kentucky area. I currently require the use of an inhaler every day and I also carry a rescue inhaler which I use a few times a week. On particularly bad air quality days, I have experienced tightening of my chest and have also felt incapacitated by it. On days when it is this bad, it usually requires that I take extra medicine and that I remain inside until my symptoms subside. As a result, on severe air days I often stay inside to minimize my exposure.

6. Because of my asthma and respiratory problems, I regularly follow the daily air report on local media; both television and the newspaper. If there is an air alert for Jefferson County, I will generally try to limit my outdoor activities.

7. I am frustrated that I live in an area with excessive air pollution, and that not enough is being done to remedy that pollution. I frequently worry about the health impacts on my grandchildren and I also worry that my ongoing exposure to dirty air is shortening my life.

8. I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

9. I understand that EPA designated Jefferson County an area that was in attainment for the 2008 ground level ozone pollution standard.

10. I understand that EPA has determined, based on scientific evidence, that exposure to ground level ozone pollution causes numerous human respiratory problems, including decreased lung function, asthma, bronchitis, emphysema and can inflame the lining of the lungs. I have also read that repeated exposure can lead to permanent scarring of the lungs. I understand that people with lung disease, children, older adults, and people who are actively outdoors, such as myself, may be particularly sensitive to ozone's effects.

12. I have reviewed the data for ground level ozone for the Jefferson County area which is available here: http://www.epa.gov/glo/pdfs/CountyPrimaryOzoneLevels0608.pdf. During the period of 2006 -2008, Jefferson County showed a 3 year concentration level for ground level ozone .079 parts per million. That level has increased; according to the data at http://www.epa.gov/airdata/ad_rep_mon.html, the ozone levels between 2010 and 2012 rose to an average of .081 ppm.

13. I understand that Sierra Club is now suing EPA to force the agency to designate Jefferson County, KY as a nonattainment area. I support the Sierra Club lawsuit. If EPA determined that Jefferson County is in non-attainment, I will benefit from the resulting reductions in ozone pollution that will be required and I will worry less about my health. If, however, EPA fails to designate Jefferson County as nonattainment, I will not receive these benefits and will continue to be harmed by ozone pollution in my area.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 31, 2013.

Elizabeth Rudd Bennett

Elizabeth Rudd Bennett

EXHIBIT 10

Declaration of
Gerald Rudolph Hasspacher

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al*., Respondents.	**DECLARATION OF GERALD RUDOLPH HASSPACHER IN SUPPORT OF JOINT PETITIONER'S BRIEF** Case No. 12-1317 (consolidated with No.12-1309 *et al.*)

I, Gerald Rudolph Hasspacher, declare as follows:

1. My name is Gerald Rudolph Hasspacher. I am over 18 years of age. The information in this declaration is based on my personal knowledge and my review of publicly available information in government records and, if called to testify, I would testify as to the facts stated in this declaration.

2. I live in Warren, Michigan, within Macomb County. I have lived in Warren continuously since 1980 and have lived at my current address for just under 10 years.

3. I have been a continuous member of Sierra Club since November 2005. I volunteer with the Sierra Club Southeast Michigan Group, and I serve as the Chairman of the "Green Schools Promotion Committee" as well as a co-sponsor of the annual "Green Cruise" event. I have also been on the Environment Committee for the city of Warren, Michigan since 2009.

4. I enjoy bicycling and taking walks outside near my home in Macomb County, often with my family and/or friends. I will continue to enjoy these outdoor activities on a regular basis in the future as long as I am physically able.

5. I have two heart conditions: aortic insufficiency and mitral valve prolapse. I take the medication Lisinopril to treat those conditions.

6. I am very concerned about the air quality in my county and I am troubled to know that my county is not meeting EPA's air quality standards.

7. I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

8. I understand that EPA designated Macomb County an area that was in attainment for the 2008 ground level ozone pollution standard.

9. I understand that EPA has determined, based on scientific evidence, that exposure to ground level ozone pollution causes numerous human respiratory problems, including decreased lung function, asthma, bronchitis, emphysema and can inflame the lining of the lungs. I have also read that repeated exposure can lead to permanent scarring of the lungs. I understand that older adults, children, people with lung disease, and people who are active outdoors, such as myself, may be particularly sensitive to ozone's effects.

10. I understand that Sierra Club is now suing EPA to force the agency to designate Macomb County as a nonattainment area. I support the Sierra Club lawsuit. If EPA determined that Macomb County is in nonattainment, I will benefit from the resulting reductions in ozone pollution that will be required. If, however, EPA fails to designate our area as nonattainment, I will not receive these benefits and we will continue to be harmed by ozone pollution.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed September 11th, 2013.

/s/Gerald Hasspacher

Gerald R. Hasspacher

EXHIBIT 11

Declaration of
Jan Clinton Erkenbrack

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB **Petitioner,** **v.** **UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,** **Respondents.**	**DECLARATION OF JAN CLINTON ERKENBRACK IN SUPPORT OF JOINT PETITIONER'S BRIEF** **Case No. 12-1317 (consolidated with No.12-1309 *et al.*)**

I, Jan C. Erkenbrack, declare as follows:

My name is Jan Clinton Erkenbrack. I am over 18 years of age. The information in this declaration is based on my personal knowledge and my review of publicly available information in government records and, if called to testify, I would testify as to the facts stated in this declaration.

I live in Twin Lake within Muskegon County, Michigan. I have lived at this address for over 4 years.

I have been a continuous member of Sierra Club since 2004. I am an active member and regularly attend meetings.

I enjoy hiking, bicycling and gardening at or near my home in Muskegon County. I also visit the county beaches on a weekly basis during the summer, such as Pere Marquette public beach. I often go to the beaches with my friends, and I will continue to visit the beaches on a regular basis in the future as long as I am physically able.

I am very concerned about the air quality in my county, especially since we are located upwind of the B.C. Cobb coal plant. I am also very troubled to know that my county is not meeting EPA's air quality standards, especially because I moved from the city to get better air quality conditions for my health.

I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

I understand that EPA designated Muskegon County an area that was in attainment for the 2008 ground level ozone pollution standard.

I understand that EPA has determined, based on scientific evidence, that exposure to ground level ozone pollution causes numerous human respiratory problems, including decreased lung function, asthma, bronchitis, emphysema and can inflame the lining of the lungs. I have also read that repeated exposure can lead to permanent scarring of the lungs. I understand that older adults, children, people with lung disease, and people who are active outdoors, such as myself, may be particularly sensitive to ozone's effects.

I understand that Sierra Club is now suing EPA to force the agency to designate Muskegon County as a nonattainment area. I support the Sierra Club lawsuit. If EPA determined that Muskegon County is in nonattainment, I will benefit from the resulting reductions in ozone pollution that will be required. If, however, EPA fails to designate our area as nonattainment, I will not receive these benefits and we will continue to be harmed by ozone pollution.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed September 9, 2013.

Jan C. Erkenbrack

EXHIBIT 12

Declaration of Joseph Ziolkowski

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*, Respondents.	**DECLARATION OF JOSEPH ZIOLKOWSKI IN SUPPORT OF JOINT PETITIONER'S BRIEF** Case No. 12-1317 (consolidated with No.12-1309 *et al.*)

I, Joseph Ziolkowski, declare as follows:

1. My name is Joseph Ziolkowski. I am over 18 years of age. The information in this declaration is based on my personal knowledge and my review of publicly available information in government records and, if called to testify, I would testify as to the facts stated in this declaration.

2. I live in Allegan County, Michigan. My current address is 3785 105th Avenue, Allegan, Michigan 49010. I have lived at this address with my wife for almost eight years.

3. I am a member of the Sierra Club. I joined the Sierra Club approximately 25 years ago because I was concerned about the environment. Currently, I am the treasurer and an executive committee member for the Michigan Chapter's Southwest Michigan Group.

4. I enjoy being outdoors. We have several gardens at my house and in the summer, I enjoy spending time in them about three times a week.

5. My adult daughter lives about 15 miles from us in Plainwell, Michigan which is also in Allegan County. She suffers from asthma. She uses two different inhalers – the first one daily to manage her asthma symptoms and the second one when she has asthma attacks. I am very concerned for her health.

6. I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

7. I understand that EPA designated Allegan County an area that was in attainment for the 2008 ground level ozone pollution standard.

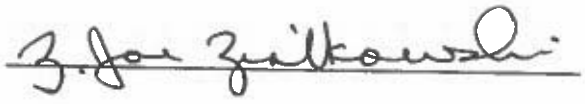
8. I understand that EPA has determined, based on scientific evidence, that exposure to ground level ozone pollution causes numerous human respiratory problems, including decreased lung function, asthma, bronchitis, emphysema and can inflame the lining of the lungs. I have

also read that repeated exposure can lead to permanent scarring of the lungs. I understand that people with lung disease, children, older adults, and people who are active outdoors, such as myself, may be particularly sensitive to ozone.

9. I understand that Sierra Club is now suing EPA to force the agency to designate Allegan County as a nonattainment area. I support the Sierra Club lawsuit. If EPA determined that Allegan County is in nonattainment, my daughter and I will benefit from the resulting reductions in ozone pollution that will be required and I will worry less about our health. If, however, EPA fails to designate Allegan County as nonattainment, we will not receive these benefits and we will continue to be harmed by ozone pollution in our area.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed September 10, 2013.



Joseph Ziolkowski

EXHIBIT 13

Declaration of Keith Caye

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al*., Respondents.	**DECLARATION OF KEITH CAYE IN SUPPORT OF JOINT PETITIONER'S BRIEF** Case No. 12-1317 (consolidated with No.12-1309 *et al.*)

I, Keith Caye do declare as follows:

1. My name is Keith Caye. I am over 18 years of age. The information in this declaration is based on my personal knowledge or public information in government records and, if called to testify, I would testify as to the facts stated in this declaration.

2. I have been a continuous Sierra Club Member since 1998.

3. I live in Oldham County, Kentucky. I have lived at this address since 2006.

4. I enjoy regularly gardening, landscaping, walking and hiking. I engage in these activities primarily at my home or in areas throughout Oldham County. I generally participate in these activities 4-5 times per week and I intend to continue to doing so on a regular basis in the future as long as I am physically able to do so.

5. On days with high levels of ozone pollution, I have experienced difficulty with breathing and burning eyes. On particularly bad days, I will often refrain from going outside to do some gardening or landscaping out of concern about the air quality.

6. I recently worked in downtown Louisville. The job required that I drive from Oldham County to Louisville and park near the downtown area; my office was a short walk from the parking structure. Most days leaving work during my walk back to my car, I was subjected to intense ozone and air pollution conditions; I often experienced burning eyes and shortness of breath. It was also not uncommon to see grayish smoggy skies.

7. The primary source I use to inform myself about air pollution is my local public radio affiliate. On extreme air days, the radio station will often provide alerts to inform the public about the air quality.

8. When I learn that pollution levels in my area are elevated, I become concerned about the effect that this pollution will have on my health and the health of my girlfriend. My girlfriend

suffers with asthma and I have noticed that on days with excessive levels of ozone and air pollution that her breathing is impaired; if we are hiking or doing something together outside, she often struggles to keep up. I often worry that the high levels of ozone pollution we are subjected to contribute to making her asthma symptoms worse. I am frustrated that I live in an area with excessive pollution, and that not enough is being done to remedy that pollution.

9. I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

10. I understand that Oldham County was deemed a boundary area that was in attainment for the 2008 ground level ozone pollution standard.

11. I understand that EPA has determined, based on scientific evidence, that exposure to ground level ozone pollution causes numerous human respiratory problems, including decreased lung function, asthma, bronchitis, emphysema and can inflame the lining of the lungs. I have also read that repeated exposure can lead to permanent scarring of the lungs. I understand that people with lung disease, children, older adults, and people who are active outdoors, such as myself, may be particularly sensitive to ozone.

12. I am able to see the effects of ground level ozone pollution in the Oldham County - Louisville area, and I find them aesthetically displeasing.

13. I have reviewed the data for ground level ozone for the Oldham County area which is available here: http://www.epa.gov/glo/pdfs/CountyPrimaryOzoneLevels0608.pdf. During the period of 2006 - 2008, Oldham County showed a 3 year concentration level for ground level ozone .081 parts per million. That level has increased; according to the data at http://www.epa.gov/airdata/ad_rep_mon.html, the ozone levels between 2010 and 2012 rose to an average of .086 ppm.

14. If EPA designated Oldham County as a nonattainment area, restrictions would be imposed that would reduce the amount of pollution in the air I breathe. This will make it safer for me to pursue the outdoor activities described above, which I enjoy and will continue to pursue.

15. I am participating in the case because I would like to see EPA address Kentucky's ozone levels take steps to improve air quality for individuals like myself who live in counties that fail to meet the national ambient air quality standards.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed on September_14_, 2013.

_Keith Caye_____
Keith Caye

EXHIBIT 14

Declaration of Norman J. Hannigan

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al*., Respondents.	**DECLARATION OF NORMAN J. HANNIGAN IN SUPPORT OF JOINT PETITIONER'S BRIEF** Case No. 12-1317 (consolidated with No.12-1309 *et al.*)

I, Norman J. Hannigan declare as follows:

1. My name is Norman J. Hannigan. I am over 18 years of age. The information in this declaration is based on my personal knowledge and my review of publicly available information in government records and, if called to testify, I would testify as to the facts stated in this declaration.

2. I live in Gregg County, Texas. My current address is NH15 Lake Cherokee, Longview Texas 75603. I have lived at this address for 24 years.

3. I have been a continuous member of Sierra Club since April 2009.

4. I enjoy being outdoors. I enjoy gardening and walking my dog every day around Lake Cherokee, both alone and often with my wife. I am 77 years old, but still maintain an active lifestyle and will continue to do so on a regular basis in the future so long as I am physically capable.

5. I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

6. I understand that EPA designated Gregg County an area that was in attainment for the 2008 ground level ozone pollution standard.

7. I understand that EPA has determined, based on scientific evidence, that exposure to ground level ozone pollution causes numerous human respiratory problems, including decreased lung function, asthma, bronchitis, emphysema and can inflame the lining of the lungs. I have also read that repeated exposure can lead to permanent scarring of the lungs. I understand that older adults, children, people with lung disease, and people who are active outdoors, such as myself, may be particularly sensitive to ozone's effects.

8. I understand that Sierra Club is now suing EPA to force the agency to designate Gregg County as a nonattainment area. I support the Sierra Club lawsuit. If EPA determined that Gregg County is in nonattainment, my wife and I will benefit from the resulting reductions in ozone pollution that will be required. If, however, EPA fails to designate our area as nonattainment, we will not receive these benefits and we will continue to be harmed by ozone pollution.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed September _____, 2013.

"I am electronically signing this Declaration /s/ Norman J. Hannigan dated Sept.16th 2013"

_____

Norman J. Hannigan

EXHIBIT 15

Declaration of Mark David Johnson

UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al*., Respondents.	**DECLARATION OF MARK DAVID JOHNSON IN SUPPORT OF JOINT PETITIONER'S BRIEF** Case No. 12-1317 (consolidated with No.12-1309 *et al.*)

I, Mark David Johnson do declare as follows:

1. My name is Mark David Johnson. I am over 18 years of age. The information in this declaration is based on my personal knowledge and my review of public information in government records and, if called to testify, I would testify as to the facts stated in this declaration.

2. I have been a continuous Sierra Club Member since February 2005.

3. I live in Jefferson Parish, Louisiana. I have lived at this address for that past 11 years and have lived in Jefferson Parish for the past 14 years.

4. I joined Sierra Club because I am concerned with environmental issues generally, and specifically concerned with air quality issues in my area of Louisiana.

5. I enjoy regularly biking, swimming, and playing tennis outdoors in my neighborhood and at local health clubs. I generally enjoy these activities on a weekly or monthly basis and I will continue doing so on a regular basis in the future as long as I am physically capable. Additionally, I enjoy playing tennis with my children, including my 11-year old daughter. My children also enjoy swimming in the summer multiple times per week.

6. I have had minor asthma problems and have been prescribed an inhaler by a doctor which I use occasionally about every six months.

7. My 11 year old daughter was also treated in the hospital's emergency room with asthma symptoms in the spring of 2013. After our trip to the emergency room, she has needed to use a prescribed inhaler about once per month. She has had breathing problems stemming weak lungs from infancy when she was diagnosed with Respiratory Syncytial Virus (RSV) and pneumonia. Outdoor activities like tennis and swimming seem to exacerbate my daughter's breathing problems.

7. I am frustrated that I live in an area with excessive air pollution, and that not enough is being done to remedy that pollution. I am concerned about the health impacts on myself and my children, especially my daughter due to her young age and existing health conditions.

8. I understand that in March 2008, EPA set the national ambient air quality standards ("NAAQS") for ground-level ozone at 0.075 parts per million.

9. I understand that EPA designated Jefferson Parish an area that was in attainment for the 2008 ground level ozone pollution standard.

10. I understand that ozone levels are higher in summer months and try to avoid being outside during the middle of the day during these times.

11. I understand that EPA has determined, based on scientific evidence, that exposure to ground level ozone pollution causes numerous human respiratory problems, including decreased lung function, asthma, bronchitis, emphysema and can inflame the lining of the lungs. I have also read that repeated exposure can lead to permanent scarring of the lungs. I understand that people with lung disease, children, older adults, and people who are active outdoors, such as myself, may be particularly sensitive to ozone.

11. I understand that if EPA designated Jefferson Parish as a nonattainment area, restrictions would be imposed that would reduce the amount of ozone in the air that my family and I breathe. This will make it safer for my daughter and me to pursue the outdoor activities we enjoy.

12. I am participating in this case because I would like EPA to address Louisiana's ozone levels and help improve air quality for individuals like myself and my daughter who live in areas that fail to meet the national air quality standards.

Pursuant to 28 U.S.C. §1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed on September _16_, 2013.

/s/ Mark David Johnson_____
Mark David Johnson
September 16, 2013

EXHIBIT 16

Declaration of Ray Bloxham

ORAL ARGUMENT NOT YET SCHEDULED

IN THE UNITED STATES DISTRICT COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Mississippi Commission on Environmental Quality, Petitioner, v. Environmental Protection Agency, et al., Respondents.	)	Case No. 12-1309 (Lead Case) (Consolidated With Cases: 12-1310,12-1312, 12-1313, 12-1314, 12-1315, 12-1316, 12-1317, 12-1318, 12-1322, 12-1323, 12-1324, 12-1325, 12-1326, 12-1328, 12-1349, 13-1030, 13-1032, 13-1046, 13-1050, 13-1051, 13-1052, 13-1053, 13-1054, 13-1055, 13-1061)
State of Connecticut, et al., Intervenors.	)	

DECLARATION OF RAY BLOXHAM

I, Ray Bloxham, declare as follows:

1. The facts set forth in this declaration are based on my personal knowledge. If called as a witness in these proceedings, I could and would testify competently to these facts.

2. I am the Utah Field Director for the Southern Utah Wilderness Alliance (SUWA) and have served in this position since 1999. This position requires me to spend considerable time on-the-ground visiting public lands throughout Utah, including the Uinta Basin. In this capacity I have traveled extensively through

Utah. I am also an active member of SUWA and have been a member since 1999.

3. SUWA, based in Salt Lake City, Utah, has more than 15,000 members, many of whom reside in Utah. SUWA's mission is the preservation of the outstanding wilderness and other sensitive public lands at the heart of the Colorado Plateau, and the management of these lands in their natural state for the benefit of all Americans. SUWA 1) promotes local and national recognition of the region's unique character through research and public education, 2) supports both administrative and legislative initiatives to permanently protect Utah's wild places within the National Park and National Wilderness Preservation System, 3) builds support for such initiatives on both the local and national level, and 4) provides leadership within the conservation movement through uncompromising advocacy for wilderness preservation. SUWA has also worked extensively and tirelessly to protect Utah's clean air and water as well as its wildlife and vegetation. SUWA is interested in environmental justice—that people, plants, and animals see fair outcomes in environmental processes.

4. SUWA members and staff have a well demonstrated interest in the preservation and protection of Utah's remarkable public lands, as well as in federal agencies' compliance with federal environmental laws and the protection of clean air and water and the preservation of wildlife and vegetation in the region. SUWA's members and staff are motivated by issues of environmental justice and

fairness.

5. SUWA is passionate about protecting the Uinta Basin. The Basin is a magnificent desert landscape and is truly unique. This basin encompasses portions of Uintah, Duchesne, Carbon, Grand, Emery, Utah, and Wasatch counties in Utah, as well as Moffat and Rio Blanco counties in Colorado.

6. SUWA members and staff enjoy recreation, sightseeing, birdwatching, photography, and other activities in the Uinta Basin. SUWA staff and members' recreational, scientific, aesthetic, informational, and other interests are directly affected and harmed by the Environmental Protection Agency's ("EPA's") decision to not designate the Uinta Basin as a nonattainment area for ozone.

7. I personally use and enjoy the incredible lands in the Uinta Basin. I use these lands for many health, recreational, spiritual, educational, aesthetic, and other purposes. I enjoy my visits to this area. During my visits I enjoy the incredible views of the lands, the remote nature of the area, the abundant wildlife, and the native and endemic vegetation. I also enjoy the opportunities for recreation on the Green River. Clean air is an integral component of all these activities. I last visited the Uinta Basin in August 2013. Prior to this occasion, I frequently visited, viewed, and appreciated this area during my regular visits. I intend to return to these lands as often as possible, but definitely within the next year. My health, recreational, spiritual, educational, aesthetic, and other interests will be directly

affected and irreparably harmed by the EPA's failure to designate the Uinta Basin as a nonattainment area under federal ozone standards.

8. I am aware that monitors in the Uinta Basin have recorded exceptionally high levels of ozone in the past few years. These high levels of ozone have been recorded primarily in the winter months. Although current health limits established by the EPA limit ozone concentrations to no more than 0.075 parts per million over an eight hour period, monitors in the Uinta Basin have frequently reported ozone concentrations in excess of 0.100 parts per million over an eight hour period.

9. By visiting the Uinta Basin, I have personally witnessed the deterioration of its clean air. On some days, the brown haze is so thick that it is difficult to see landmarks. The deterioration of the air in the Uinta Basin makes me worry for my health and makes me hesitant to return. Whenever I visit the area, and the air-pollution levels are high, my enjoyment is diminished.

10. Despite the air-pollution problems, I intend to return to the Uinta Basin regularly. When the pollution levels are low, the scenery is stunning. The enjoyment I experience by visiting the Uinta Basin would be enhanced if the region's air pollution were to return to healthy levels. If the air-pollution remains, however, I worry that my health will be negatively affected by my visits. On the

other hand, if the air-quality improves, I will no longer worry about visiting the Uinta Basin.

11. For these reasons, I am saddened and disappointed that the EPA failed to designate the Uinta Basin as a nonattainment area for ozone. Even though the EPA admits that the Uinta Basin has exceeded federal ozone standards on numerous occasions, the EPA declared that the ozone data from Uinta Basin monitors were "non-regulatory." Consequently, the EPA determined that the Uinta Basin was "unclassifiable," instead of in nonattainment. This determination is unlawful and disappointing.

12. If the EPA were to designate the region as in nonattainment for ozone, the EPA and the State of Utah would be obligated to clean up the ozone pollution. This would make my visits to the Uinta Basin more enjoyable and less worrisome. Air pollution would diminish and the visibility would improve.

13. A nonattainment designation would protect people and ecosystems in the Uinta Basin. The Basin's air would begin to improve, my visits would become more enjoyable, my worries would ease, and SUWA's interest of protecting outstanding Utah lands would be furthered.

I DECLARE, under penalty of perjury, that the foregoing is true and correct.

September 16, 2013

Ray Bloxham

EXHIBIT 17

Declaration of Jeremy Nichols

ORAL ARGUMENT NOT YET SCHEDULED

IN THE UNITED STATES DISTRICT COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Mississippi Commission on Environmental Quality, Petitioner, v. Environmental Protection Agency, et al., Respondents. State of Connecticut, et al., Intervenors.	Case No. 12-1309 (Lead Case) (Consolidated With Cases: 12-1310,12-1312, 12-1313, 12-1314, 12-1315, 12-1316, 12-1317, 12-1318, 12-1322, 12-1323, 12-1324, 12-1325, 12-1326, 12-1328, 12-1349, 13-1030, 13-1032, 13-1046, 13-1050, 13-1051, 13-1052, 13-1053, 13-1054, 13-1055, 13-1061)

DECLARATION OF JEREMY NICHOLS

DECLARATION OF JEREMY NICHOLS

I, Jeremy Nichols, declare as follows:

1. The facts set forth in this declaration are based on my personal knowledge. If called as a witness in these proceedings, I could and would testify competently to these facts.

2. I currently reside in Golden, Colorado.

3. I am a member of the Utah Physicians for a Healthy Environment, and have been since 2011. Utah Physicians for a Healthy Environment is the largest civic organization of health care professionals in Utah. It has over 230 members, whom are primarily physicians, but also include other health care professionals, biologists, toxicologists, engineers, air quality specialists and the general public. The organization is concerned about the health risks present in our environment, based on the overwhelming, convincing evidence in the medical literature demonstrating a wide array of chronic diseases are more common among people who are exposed to more air pollution. The organization advocates for cleaner air throughout Utah.

4. I am also dues-paying member and employee of WildEarth Guardians and have been since July 2008. WildEarth Guardians is a non-profit environmental organization dedicated to protecting and restoring the wildlife, wild places and wild rivers throughout the American West (primarily the interior western states of

Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming). WildEarth Guardians is headquartered in Santa Fe, New Mexico, but maintains offices in Denver, Colorado, Tucson, Arizona, and Missoula, Montana. The organization has 7,538 dues-paying members and more than 30,000 supporters. I support the mission of the organization personally and professionally.

5. I am the Director of WildEarth Guardians' Climate and Energy Program. WildEarth Guardians' Climate and Energy Program aims to protect the wildlife, wild places, and wild rivers of the American West from the impacts of fossil fuel development and consumption with an aim to curtail greenhouse gas emissions and safeguard the climate. As Director of the Climate and Energy Program, I advocate for the development and promotion of cleaner energy solutions that can help our society shift away from the use of fossil fuels in order to safeguard our climate, our clean air, and our communities. As part of my work as Climate and Energy Program Director, I focus extensively on combating air pollution in the American West.

6. I enjoy visiting and recreating in the outdoors throughout the American West, particularly in the region's more remote and wild landscapes. My recreational activities include hiking, cycling, camping, rockhounding, river

floating, viewing scenic landscapes, observing plant life, and wildlife viewing. I enjoy these activities greatly; they keep me both physically and mentally healthy.

7. One area of the West that I recreate in frequently is the Uinta Basin region of northeastern Utah. The Basin is a dissected desert landscape bounded to the north by the Uinta Mountains, the south by the Book Cliffs, the west by the Wasatch Mountains, and the east by the Douglas Creek Arch. It generally encompasses portions of Uintah, Duchesne, Carbon, Grand, Emery, Utah, and Wasatch Counties in northeastern Utah and a portion of Rio Blanco and Moffat Counties in northwestern Colorado.

8. This region includes some amazingly scenic landscapes, including the Uinta Mountain uplift, the Green River, the Book Cliffs region, Dinosaur National Monument, and many other uplifts and canyons. Redrock outcrops and buttes punctuate the region's expanse of sagebrush-dotted high desert. Geologically, the region bears significant fossils, including dinosaur fossils from the Jurassic Morrison formation deposited and more recent fossils from the Tertiary Green River formation that were deposited when much of the region was inundated by prehistoric Lake Uinta. The region also contains vast swaths of public lands owned and managed by the U.S. Bureau of Land Management. These public lands are mostly remote and undeveloped, providing a tremendous opportunity for one to "get away from it all" and enjoy the nature of this high desert country.

9. I visit the Uinta Basin regularly to recreate and enjoy the scenery, the geology, the remoteness, and the flora and fauna of the region. I also recreate in and enjoy the region when traveling through on my way to visit friends in Salt Lake City, Utah. In fact, I have visited the region at least once a year every year since 2006.

10. My most recent visit was on July 22, 2013, when I hiked in the Douglas Creek Arch area that borders the eastern portion of the Basin in Uintah County. My family and I had intended to float the White River, which flows out of western Colorado and into northeastern Utah where it connects with the Green River, but due to low water, cancelled our float plans and instead camped in the area and went hiking.

11. Previous to that, I visited the Basin during the July 4th holiday in 2012, when my family and I floated the Green River below the Flaming Gorge Dam and visited Dinosaur National Monument in Uintah County, Utah. Before, I visited the area to recreate while traveling to Salt Lake City, Utah to visit friends in late April of 2012, during which I hiked in public lands along the Green River south of Vernal, Utah, also in Uintah County. I also visited the area in August of 2011 while en route to a meeting in Vernal, Utah, visited the area in late March of 2011 while en route to Salt Lake City, and visited the area in late December of 2010 while en route to Salt Lake City. I intend to recreate in and enjoy the area again on

September 21st and 22nd, 2013 when I travel to Salt Lake City to visit friends, during which time I plan to hike in the area. I plan to continue visiting the region, and the parts of the region in Uintah and Duquesne Counties, specifically, for recreational enjoyment long into the future.

12. From where I hiked on July 22, 2013, I could view out into the Uinta Basin and see the Uinta Mountains, the Green River, and the extensive high desert landscape. I was hiking cross-country on public lands in the area to the north of Uintah County Road 45, just east of the small town of Bonanza. I enjoyed this hike.

13. The sight of the nearby Bonanza coal-fired power plant, however, disrupted my enjoyment. The smokestack of this large, 500-megawatt power plant sticks out in the region and frequently has visible emissions (in fact, during my visit, I could see visible emissions from the plant's smokestack). I have observed this power plant on numerous occasions, both while hiking in the area and while traveling through the region, including in the wintertime and springtime. The sight of this power plant and its visible emissions are disruptive to my recreational enjoyment of the area. I understand that the smokestack of this power plant releases a number of pollutants that are harmful to human health, including nitrogen oxides. Observing these emissions makes me worried for my health, and

for the health of my family when they accompany me on recreational trips in the area.

14. My concerns over air pollution from the Bonanza coal-fired power plant are underscored by broader and more significant air quality issues in the Uinta Basin; particularly the issue of ground-level ozone. I am aware that in the last few years, the Uinta Basin has experienced a surge in ground-level ozone pollution, as well as other harmful air pollution.

15. I am aware that monitors have for the past several years recorded exceptionally high levels of ozone in the Uinta Basin. These high ozone levels have primarily been recorded in the winter months. Although current health limits established by the U.S. Environmental Protection Agency ("EPA") limit ozone concentrations to no more than 0.075 parts per million over an eight hour period, concentrations in the Uinta Basin have frequently exceeded 0.100 parts per million over an eight hour period since at least 2010.

16. I have observed and experienced the air pollution in the region, particularly in the wintertime when ozone levels are elevated, but also in other times of the year when both ozone and other pollutant levels have been elevated. This air pollution offends me when I visit the region and makes me worried for my health. Whenever I visit the region and I observe air pollution, my enjoyment is diminished.

17. When ozone levels in the region are high, it is noticeable as there is often a brownish to grayish haze that seems to blanket the region. This haze is impossible not to notice on high ozone days. It seems to reflect conditions where air pollution is trapped near the ground and allowed to build up. This seems to fuel the region's exceptionally high ozone levels.

18. I know that ozone forms when two key pollutants, nitrogen oxides and volatile organic compounds, react with sunlight in the atmosphere. These pollutants are released from tailpipes, smokestacks, and other industrial sources. In my visits to the Uinta Basin, nitrogen oxide and volatile organic compound emissions from industrial activities are ubiquitous. In addition to the Bonanza coal-fired power plant, the region is in the midst of a major oil and gas drilling boom. This activity is a pollution intensive process. Not only does it require a number of pieces of fuel burning equipment (service trucks, drilling rigs, compressor engines, flares, etc.), but the actual oil and gas that is produced is volatile and readily evaporates into the air when brought to the surface, transported, and processed. In fact, I have observed facilities in the region that evaporate oil into the air on purpose as a waste disposal practice. I have also observed flaring of gas at well sites and other industrial facilities, where waste oil and gas is burned and exhausted into the air.

19. The air quality impacts are obvious. Oil and gas drilling activity is occurring everywhere in the region. When driving through the region, the bulk of the traffic is trucks that are servicing oil and gas wells or hauling oil. This industrial pollution is offensive to observe and makes me further worried for my health in light of the region's growing ozone pollution.

20. I intend to continue visiting the Uinta Basin, including the portions of the Basin in Uintah and Duquesne Counties, regularly. Despite its air pollution problems, it can be a beautiful landscape. On days when the haze clears, the rugged Uinta Mountains can be observed to the north. On days when there is no pollution, it is a joy to explore the region and find places to hike and camp.

21. My enjoyment of the Uinta Basin would be greatly enhanced if the region's air pollution were to be curtailed and reduced to below unhealthy levels. I am aware that ozone suppresses vegetation growth, so I am concerned that the current levels of ozone pollution will harm the sagebrush that make the vistas in the area so awe-inspiring, diminishing their beauty and my enjoyment of them. I worry that, if conditions stay the same, my health will decline as I am exposed to this pollution. I especially worry about the health of my family when they accompany me on hikes and other recreational activities in the area. I am particularly concerned because in the past, I have visited the area during the winter,

the season when ozone pollution is especially dangerous, and anticipate doing so again in the future. If conditions are reversed, my worries will diminish.

22. To this end, if the Uinta Basin were designated a nonattainment area under the Clean Air Act due to violations of the ozone air quality standards, the region's ozone pollution would be ameliorated. I understand the Clean Air Act requires as a key principle that air pollution in nonattainment areas be reduced so that these areas are no longer in nonattainment. Unfortunately, without a nonattainment designation, there is no mandatory requirement that the reigon's unhealthy ozone pollution be reduced so that the Uinta Basin is no longer in violation.

23. This is why I am incredibly upset by the U.S. Environmental Protection Agency's ("EPA's") decision to not designate the Uinta Basin as a nonattainment area due to violations of federal ozone standards. Despite acknowledging that the region has exceeded the ozone standards on numerous occasions over the years and despite acknowledging that monitoring sites in the region demonstrate a violation, the EPA played a bureaucratic game and declared the ozone data to be "non-regulatory." In doing so, the EPA determined that the Uinta Basin was not a nonattainment area, but rather "unclassifiable."

24. Despite EPA's excuses for not designating the Uinta Basin nonattainment, the ozone pollution is real and unhealthy. For people like me who

have been breathing and will continue to breathe and be exposed to elevated ozone levels in the Uinta Basin, our lungs don't distinguish between "non-regulatory" or "regulatory" ozone. It is all the same and in the Uinta Basin, it is all unhealthy. EPA's determination is completely disconnected with reality and beyond disappointing. It is the worst example of the U.S. Government covering up real problems that affect real people with administrative sleight of hand.

25. Worse, because of EPA's "unclassifiable" designation, they have given the public the impression that the region's ozone pollution is healthy. As someone who is knowledgeable about the reality of the situation, this shocks and offends me. I feel that EPA has a professional obligation to honestly inform the public of the risks of air pollution and to protect the public from these risks. EPA's "unclassifiable" designation of the Uinta Basin pulls the wool over the public's eyes.

26. To this end, the EPA's deceiving "unclassifiable" designation harms Utah Physicians for a Healthy Environment and WildEarth Guardians in their efforts to educate people about ozone pollution in the Uinta Basin. People have been misled to believe there is no problem. In doing so, they have fomented a greater risk that people will be exposed to unhealthy air pollution because of disregard over the true nature of the problem. It has become more difficult for Utah Physicians for a Healthy Environment and WildEarth Guardians to

effectively educate members and the public about this issue in light of the EPA's decision.

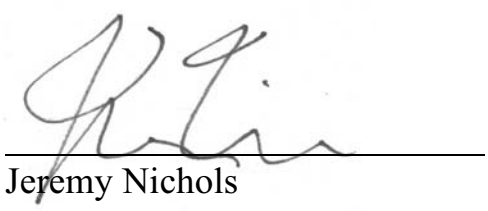
27. If EPA were to designate the region as nonattainment, the Agency and the State of Utah would be obligated to clean up the ozone pollution in the Uinta Basin. This would make my visits more enjoyable and make me less worried for my health and the health of my family. A nonattainment designation would lead to reductions in air pollution, especially reductions in nitrogen oxide and volatile organic compound emissions, from oil and gas drilling activities, the Bonanza power plant, and other sources. Reductions in these emissions would be noticeable. They would lead to a reduction in both visible pollutants (such as nitrogen oxide emissions from tailpipes and smokestacks) and visible pollutant emitting activities (such as activities that dispose of oil through evaporation and flaring activities). Not observing as much air pollution, particularly from the smokestack of the Bonanza power plant, but also other oil and gas operations, would be much more pleasant and would make me feel more at ease that my health is not eroding because of unhealthy ozone. This would benefit Utah Physicians for a Healthy Environment and WildEarth Guardians in their efforts to protect public health from air pollution and to restore clean air in Utah.

28. A nonattainment designation would also enable Utah Physicians for a Healthy Environment and WildEarth Guardians to more effectively educate the

public about the health risks of unhealthy ozone pollution in the Uinta Basin and ensure that the public is given a chance to make informed choices about their exposure to this air pollution.

Pursuant to 28 U.S.C. § 1746, I declare, under penalty of perjury, that the foregoing is true and correct.

Executed this 16th day of September, 2013 in Golden, Colorado



Jeremy Nichols

ADDENDUM

STATUTES AND REGULATIONS

STATUTES

REGULATIONS

42 U.S.C. § 7407

§ 7407. Air quality control regions

(a) Responsibility of each State for air quality; submission of implementation plan

Each State shall have the primary responsibility for assuring air quality within the entire geographic area comprising such State by submitting an implementation plan for such State which will specify the manner in which national primary and secondary ambient air quality standards will be achieved and maintained within each air quality control region in such State.

(b) Designated regions

For purposes of developing and carrying out implementation plans under section 7410 of this title--

(1) an air quality control region designated under this section before December 31, 1970, or a region designated after such date under subsection (c) of this section, shall be an air quality control region; and

(2) the portion of such State which is not part of any such designated region shall be an air quality control region, but such portion may be subdivided by the State into two or more air quality control regions with the approval of the Administrator.

(c) Authority of Administrator to designate regions; notification of Governors of affected States

The Administrator shall, within 90 days after December 31, 1970, after consultation with appropriate State and local authorities, designate as an air quality control region any interstate area or major intrastate area which he deems necessary or appropriate for the attainment and maintenance of ambient air quality standards. The Administrator shall immediately notify the Governors of the affected States of any designation made under this subsection.

(d) Designations

(1) Designations generally

(A) Submission by Governors of initial designations following promulgation of new or revised standards

By such date as the Administrator may reasonably require, but not later than 1 year after promulgation of a new or revised national ambient air quality standard for any pollutant under section 7409 of this title, the Governor of each State shall (and at any other time the Governor of a State deems appropriate the Governor may) submit to the Administrator a list of all areas (or portions thereof) in the State, designating as--

(i) nonattainment, any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant,

(ii) attainment, any area (other than an area identified in clause (i)) that meets the national primary or secondary ambient air quality standard for the pollutant, or

(iii) unclassifiable, any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

The Administrator may not require the Governor to submit the required list sooner than 120 days after promulgating a new or revised national ambient air quality standard.

(B) Promulgation by EPA of designations

(i) Upon promulgation or revision of a national ambient air quality standard, the Administrator shall promulgate the designations of all areas (or portions thereof) submitted under subparagraph (A) as expeditiously as practicable, but in no case later than 2 years from the date of promulgation of the new or revised national ambient air quality standard. Such period may be extended for up to one year in the event the Administrator has insufficient information to promulgate the designations.

(ii) In making the promulgations required under clause (i), the Administrator may make such modifications as the Administrator deems necessary to the designations of the areas (or portions thereof) submitted under subparagraph (A) (including to the boundaries of such areas or portions thereof). Whenever the Administrator intends to make a modification, the Administrator shall notify the State and provide such State with an opportunity to demonstrate why any proposed modification is inappropriate. The Administrator shall give such notification no later than 120 days before the date the Administrator promulgates the designation, including any modification thereto. If the Governor fails to submit the list in whole or in part, as required under subparagraph (A), the Administrator shall promulgate

the designation that the Administrator deems appropriate for any area (or portion thereof) not designated by the State.

(iii) If the Governor of any State, on the Governor's own motion, under subparagraph (A), submits a list of areas (or portions thereof) in the State designated as nonattainment, attainment, or unclassifiable, the Administrator shall act on such designations in accordance with the procedures under paragraph (3) (relating to redesignation).

(iv) A designation for an area (or portion thereof) made pursuant to this subsection shall remain in effect until the area (or portion thereof) is redesignated pursuant to paragraph (3) or (4).

(C) Designations by operation of law

(i) Any area designated with respect to any air pollutant under the provisions of paragraph (1)(A), (B), or (C) of this subsection (as in effect immediately before November 15, 1990) is designated, by operation of law, as a nonattainment area for such pollutant within the meaning of subparagraph (A)(i).

(ii) Any area designated with respect to any air pollutant under the provisions of paragraph (1)(E) (as in effect immediately before November 15, 1990) is designated by operation of law, as an attainment area for such pollutant within the meaning of subparagraph (A)(ii).

(iii) Any area designated with respect to any air pollutant under the provisions of paragraph (1)(D) (as in effect immediately before November 15, 1990) is designated, by operation of law, as an unclassifiable area for such pollutant within the meaning of subparagraph (A)(iii).

(2) Publication of designations and redesignations

(A) The Administrator shall publish a notice in the Federal Register promulgating any designation under paragraph (1) or (5), or announcing any designation under paragraph (4), or promulgating any redesignation under paragraph (3).

(B) Promulgation or announcement of a designation under paragraph (1), (4) or (5) shall not be subject to the provisions of sections 553 through 557 of Title 5 (relating to notice and comment), except nothing herein shall be construed as precluding such public notice and comment whenever possible.

(3) Redesignation

(A) Subject to the requirements of subparagraph (E), and on the basis of air quality data, planning and control considerations, or any other air quality-related considerations the Administrator deems appropriate, the Administrator may at any time notify the Governor of any State that available information indicates that the designation of any area or portion of an area within the State or interstate area should be revised. In issuing such notification, which shall be public, to the Governor, the Administrator shall provide such information as the Administrator may have available explaining the basis for the notice.

(B) No later than 120 days after receiving a notification under subparagraph (A), the Governor shall submit to the Administrator such redesignation, if any, of the appropriate area (or areas) or portion thereof within the State or interstate area, as the Governor considers appropriate.

(C) No later than 120 days after the date described in subparagraph (B) (or paragraph (1)(B)(iii)), the Administrator shall promulgate the redesignation, if any, of the area or portion thereof, submitted by the Governor in accordance with subparagraph (B), making such modifications as the Administrator may deem necessary, in the same manner and under the same procedure as is applicable under clause (ii) of paragraph (1)(B), except that the phrase “60 days” shall be substituted for the phrase “120 days” in that clause. If the Governor does not submit, in accordance with subparagraph (B), a redesignation for an area (or portion thereof) identified by the Administrator under subparagraph (A), the Administrator shall promulgate such redesignation, if any, that the Administrator deems appropriate.

(D) The Governor of any State may, on the Governor's own motion, submit to the Administrator a revised designation of any area or portion thereof within the State. Within 18 months of receipt of a complete State redesignation submittal, the Administrator shall approve or deny such redesignation. The submission of a redesignation by a Governor shall not affect the effectiveness or enforceability of the applicable implementation plan for the State.

(E) The Administrator may not promulgate a redesignation of a nonattainment area (or portion thereof) to attainment unless--

(i) the Administrator determines that the area has attained the national ambient air quality standard;

(ii) the Administrator has fully approved the applicable implementation plan for the area under section 7410(k) of this title;

(iii) the Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and enforceable reductions;

(iv) the Administrator has fully approved a maintenance plan for the area as meeting the requirements of section 7505a of this title; and

(v) the State containing such area has met all requirements applicable to the area under section 7410 of this title and part D of this subchapter.

(F) The Administrator shall not promulgate any redesignation of any area (or portion thereof) from nonattainment to unclassifiable.

(4) Nonattainment designations for ozone, carbon monoxide and particulate matter (PM-10)

(A) Ozone and carbon monoxide

(i) Within 120 days after November 15, 1990, each Governor of each State shall submit to the Administrator a list that designates, affirms or reaffirms the designation of, or redesignates (as the case may be), all areas (or portions thereof) of the Governor's State as attainment, nonattainment, or unclassifiable with respect to the national ambient air quality standards for ozone and carbon monoxide.

(ii) No later than 120 days after the date the Governor is required to submit the list of areas (or portions thereof) required under clause (i) of this subparagraph, the Administrator shall promulgate such designations, making such modifications as the Administrator may deem necessary, in the same manner, and under the same procedure, as is applicable under clause (ii) of paragraph (1)(B), except that the phrase “60 days” shall be substituted for the phrase “120 days” in that clause. If the Governor does not submit, in accordance with clause (i) of this subparagraph, a designation for an area (or portion thereof), the Administrator shall promulgate the designation that the Administrator deems appropriate.

(iii) No nonattainment area may be redesignated as an attainment area under this subparagraph.

(iv) Notwithstanding paragraph (1)(C)(ii) of this subsection, if an ozone or carbon monoxide nonattainment area located within a metropolitan statistical area or consolidated metropolitan statistical area (as established by the Bureau of the Census) is classified under part D of this subchapter as a Serious, Severe, or

Extreme Area, the boundaries of such area are hereby revised (on the date 45 days after such classification) by operation of law to include the entire metropolitan statistical area or consolidated metropolitan statistical area, as the case may be, unless within such 45-day period the Governor (in consultation with State and local air pollution control agencies) notifies the Administrator that additional time is necessary to evaluate the application of clause (v). Whenever a Governor has submitted such a notice to the Administrator, such boundary revision shall occur on the later of the date 8 months after such classification or 14 months after November 15, 1990, unless the Governor makes the finding referred to in clause (v), and the Administrator concurs in such finding, within such period. Except as otherwise provided in this paragraph, a boundary revision under this clause or clause (v) shall apply for purposes of any State implementation plan revision required to be submitted after November 15, 1990.

(v) Whenever the Governor of a State has submitted a notice under clause (iv), the Governor, in consultation with State and local air pollution control agencies, shall undertake a study to evaluate whether the entire metropolitan statistical area or consolidated metropolitan statistical area should be included within the nonattainment area. Whenever a Governor finds and demonstrates to the satisfaction of the Administrator, and the Administrator concurs in such finding, that with respect to a portion of a metropolitan statistical area or consolidated metropolitan statistical area, sources in the portion do not contribute significantly to violation of the national ambient air quality standard, the Administrator shall approve the Governor's request to exclude such portion from the nonattainment area. In making such finding, the Governor and the Administrator shall consider factors such as population density, traffic congestion, commercial development, industrial development, meteorological conditions, and pollution transport.

(B) PM-10 designations

By operation of law, until redesignation by the Administrator pursuant to paragraph (3)--

(i) each area identified in 52 Federal Register 29383 (Aug. 7, 1987) as a Group I area (except to the extent that such identification was modified by the Administrator before November 15, 1990) is designated nonattainment for PM-10;

(ii) any area containing a site for which air quality monitoring data show a violation of the national ambient air quality standard for PM-10 before January 1, 1989 (as determined under part 50, appendix K of title 40 of the Code of Federal Regulations) is hereby designated nonattainment for PM-10; and

(iii) each area not described in clause (i) or (ii) is hereby designated unclassifiable for PM-10.

Any designation for particulate matter (measured in terms of total suspended particulates) that the Administrator promulgated pursuant to this subsection (as in effect immediately before November 15, 1990) shall remain in effect for purposes of implementing the maximum allowable increases in concentrations of particulate matter (measured in terms of total suspended particulates) pursuant to section 7473(b) of this title, until the Administrator determines that such designation is no longer necessary for that purpose.

(5) Designations for lead

The Administrator may, in the Administrator's discretion at any time the Administrator deems appropriate, require a State to designate areas (or portions thereof) with respect to the national ambient air quality standard for lead in effect as of November 15, 1990, in accordance with the procedures under subparagraphs (A) and (B) of paragraph (1), except that in applying subparagraph (B)(i) of paragraph (1) the phrase "2 years from the date of promulgation of the new or revised national ambient air quality standard" shall be replaced by the phrase "1 year from the date the Administrator notifies the State of the requirement to designate areas with respect to the standard for lead".

(6) Designations

(A) Submission

Notwithstanding any other provision of law, not later than February 15, 2004, the Governor of each State shall submit designations referred to in paragraph (1) for the July 1997 $PM_{2.5}$ national ambient air quality standards for each area within the State, based on air quality monitoring data collected in accordance with any applicable Federal reference methods for the relevant areas.

(B) Promulgation

Notwithstanding any other provision of law, not later than December 31, 2004, the Administrator shall, consistent with paragraph (1), promulgate the designations referred to in subparagraph (A) for each area of each State for the July 1997 $PM_{2.5}$ national ambient air quality standards.

(7) Implementation plan for regional haze

(A) In general

Notwithstanding any other provision of law, not later than 3 years after the date on which the Administrator promulgates the designations referred to in paragraph (6)(B) for a State, the State shall submit, for the entire State, the State implementation plan revisions to meet the requirements promulgated by the Administrator under section 7492(e)(1) of this title (referred to in this paragraph as "regional haze requirements").

(B) No preclusion of other provisions

Nothing in this paragraph precludes the implementation of the agreements and recommendations stemming from the Grand Canyon Visibility Transport Commission Report dated June 1996, including the submission of State implementation plan revisions by the States of Arizona, California, Colorado, Idaho, Nevada, New Mexico, Oregon, Utah, or Wyoming by December 31, 2003, for implementation of regional haze requirements applicable to those States.

(e) Redesignation of air quality control regions

(1) Except as otherwise provided in paragraph (2), the Governor of each State is authorized, with the approval of the Administrator, to redesignate from time to time the air quality control regions within such State for purposes of efficient and effective air quality management. Upon such redesignation, the list under subsection (d) of this section shall be modified accordingly.

(2) In the case of an air quality control region in a State, or part of such region, which the Administrator finds may significantly affect air pollution concentrations in another State, the Governor of the State in which such region, or part of a region, is located may redesignate from time to time the boundaries of so much of such air quality control region as is located within such State only with the approval of the Administrator and with the consent of all Governors of all States which the Administrator determines may be significantly affected.

(3) No compliance date extension granted under section 7413(d)(5) of this title (relating to coal conversion) shall cease to be effective by reason of the regional limitation provided in section 7413(d)(5) of this title if the violation of such limitation is due solely to a redesignation of a region under this subsection.

42 U.S.C.A. § 7409

§ 7409. National primary and secondary ambient air quality standards

(a) Promulgation

(1) The Administrator--

(A) within 30 days after December 31, 1970, shall publish proposed regulations prescribing a national primary ambient air quality standard and a national secondary ambient air quality standard for each air pollutant for which air quality criteria have been issued prior to such date; and

(B) after a reasonable time for interested persons to submit written comments thereon (but no later than 90 days after the initial publication of such proposed standards) shall by regulation promulgate such proposed national primary and secondary ambient air quality standards with such modifications as he deems appropriate.

(2) With respect to any air pollutant for which air quality criteria are issued after December 31, 1970, the Administrator shall publish, simultaneously with the issuance of such criteria and information, proposed national primary and secondary ambient air quality standards for any such pollutant. The procedure provided for in paragraph (1)(B) of this subsection shall apply to the promulgation of such standards.

(b) Protection of public health and welfare

(1) National primary ambient air quality standards, prescribed under subsection (a) of this section shall be ambient air quality standards the attainment and maintenance of which in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health. Such primary standards may be revised in the same manner as promulgated.

(2) Any national secondary ambient air quality standard prescribed under subsection (a) of this section shall specify a level of air quality the attainment and maintenance of which in the judgment of the Administrator, based on such criteria, is requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air. Such secondary standards may be revised in the same manner as promulgated.

(c) National primary ambient air quality standard for nitrogen dioxide

The Administrator shall, not later than one year after August 7, 1977, promulgate a national primary ambient air quality standard for NO_2 concentrations over a period of not more than 3 hours unless, based on the criteria issued under section 7408(c) of this title, he finds that there is no significant evidence that such a standard for such a period is requisite to protect public health.

(d) Review and revision of criteria and standards; independent scientific review committee; appointment; advisory functions

(1) Not later than December 31, 1980, and at five-year intervals thereafter, the Administrator shall complete a thorough review of the criteria published under section 7408 of this title and the national ambient air quality standards promulgated under this section and shall make such revisions in such criteria and standards and promulgate such new standards as may be appropriate in accordance with section 7408 of this title and subsection (b) of this section. The Administrator may review and revise criteria or promulgate new standards earlier or more frequently than required under this paragraph.

(2)(A) The Administrator shall appoint an independent scientific review committee composed of seven members including at least one member of the National Academy of Sciences, one physician, and one person representing State air pollution control agencies.

(B) Not later than January 1, 1980, and at five-year intervals thereafter, the committee referred to in subparagraph (A) shall complete a review of the criteria published under section 7408 of this title and the national primary and secondary ambient air quality standards promulgated under this section and shall recommend to the Administrator any new national ambient air quality standards and revisions of existing criteria and standards as may be appropriate under section 7408 of this title and subsection (b) of this section.

(C) Such committee shall also (i) advise the Administrator of areas in which additional knowledge is required to appraise the adequacy and basis of existing, new, or revised national ambient air quality standards, (ii) describe the research efforts necessary to provide the required information, (iii) advise the Administrator on the relative contribution to air pollution concentrations of natural as well as anthropogenic activity, and (iv) advise the Administrator of any adverse public health, welfare, social, economic, or energy effects which may result from various strategies for attainment and maintenance of such national ambient air quality standards.

42 U.S.C. § 7502

§ 7502. Nonattainment plan provisions in general

(a) Classifications and attainment dates

(1) Classifications

(A) On or after the date the Administrator promulgates the designation of an area as a nonattainment area pursuant to section 7407(d) of this title with respect to any national ambient air quality standard (or any revised standard, including a revision of any standard in effect on November 15, 1990), the Administrator may classify the area for the purpose of applying an attainment date pursuant to paragraph (2), and for other purposes. In determining the appropriate classification, if any, for a nonattainment area, the Administrator may consider such factors as the severity of nonattainment in such area and the availability and feasibility of the pollution control measures that the Administrator believes may be necessary to provide for attainment of such standard in such area.

(B) The Administrator shall publish a notice in the Federal Register announcing each classification under subparagraph (A), except the Administrator shall provide an opportunity for at least 30 days for written comment. Such classification shall not be subject to the provisions of sections 553 through 557 of Title 5 (concerning notice and comment) and shall not be subject to judicial review until the Administrator takes final action under subsection (k) or (l) of section 7410 of this title (concerning action on plan submissions) or section 7509 of this title (concerning sanctions) with respect to any plan submissions required by virtue of such classification.

(C) This paragraph shall not apply with respect to nonattainment areas for which classifications are specifically provided under other provisions of this part.

(2) Attainment dates for nonattainment areas

(A) The attainment date for an area designated nonattainment with respect to a national primary ambient air quality standard shall be the date by which attainment can be achieved as expeditiously as practicable, but no later than 5 years from the date such area was designated nonattainment under section 7407(d) of this title, except that the Administrator may extend the attainment date to the extent the Administrator determines appropriate, for a period no greater than 10 years from the date of designation as nonattainment, considering the severity of nonattainment and the availability and feasibility of pollution control measures.

(B) The attainment date for an area designated nonattainment with respect to a secondary national ambient air quality standard shall be the date by which attainment can be achieved as expeditiously as practicable after the date such area was designated nonattainment under section 7407(d) of this title.

(C) Upon application by any State, the Administrator may extend for 1 additional year (hereinafter referred to as the "Extension Year") the attainment date determined by the Administrator under subparagraph (A) or (B) if--

(i) the State has complied with all requirements and commitments pertaining to the area in the applicable implementation plan, and

(ii) in accordance with guidance published by the Administrator, no more than a minimal number of exceedances of the relevant national ambient air quality standard has occurred in the area in the year preceding the Extension Year.

No more than 2 one-year extensions may be issued under this subparagraph for a single nonattainment area.

(D) This paragraph shall not apply with respect to nonattainment areas for which attainment dates are specifically provided under other provisions of this part.

(b) Schedule for plan submissions

At the time the Administrator promulgates the designation of an area as nonattainment with respect to a national ambient air quality standard under section 7407(d) of this title, the Administrator shall establish a schedule according to which the State containing such area shall submit a plan or plan revision (including the plan items) meeting the applicable requirements of subsection (c) of this section and section 7410(a)(2) of this title. Such schedule shall at a minimum, include a date or dates, extending no later than 3 years from the date of the nonattainment designation, for the submission of a plan or plan revision (including the plan items) meeting the applicable requirements of subsection (c) of this section and section 7410(a)(2) of this title.

(c) Nonattainment plan provisions

The plan provisions (including plan items) required to be submitted under this part shall comply with each of the following:

(1) In general

Such plan provisions shall provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology) and shall provide for attainment of the national primary ambient air quality standards.

(2) RFP

Such plan provisions shall require reasonable further progress.

(3) Inventory

Such plan provisions shall include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in such area, including such periodic revisions as the Administrator may determine necessary to assure that the requirements of this part are met.

(4) Identification and quantification

Such plan provisions shall expressly identify and quantify the emissions, if any, of any such pollutant or pollutants which will be allowed, in accordance with section 7503(a)(1)(B) of this title, from the construction and operation of major new or modified stationary sources in each such area. The plan shall demonstrate to the satisfaction of the Administrator that the emissions quantified for this purpose will be consistent with the achievement of reasonable further progress and will not interfere with attainment of the applicable national ambient air quality standard by the applicable attainment date.

(5) Permits for new and modified major stationary sources

Such plan provisions shall require permits for the construction and operation of new or modified major stationary sources anywhere in the nonattainment area, in accordance with section 7503 of this title.

(6) Other measures

Such plan provisions shall include enforceable emission limitations, and such other control measures, means or techniques (including economic incentives such as fees, marketable permits, and auctions of emission rights), as well as schedules and timetables for compliance, as may be necessary or appropriate to provide for

attainment of such standard in such area by the applicable attainment date specified in this part.

(7) Compliance with section 7410(a)(2)

Such plan provisions shall also meet the applicable provisions of section 7410(a)(2) of this title.

(8) Equivalent techniques

Upon application by any State, the Administrator may allow the use of equivalent modeling, emission inventory, and planning procedures, unless the Administrator determines that the proposed techniques are, in the aggregate, less effective than the methods specified by the Administrator.

(9) Contingency measures

Such plan shall provide for the implementation of specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the national primary ambient air quality standard by the attainment date applicable under this part. Such measures shall be included in the plan revision as contingency measures to take effect in any such case without further action by the State or the Administrator.

(d) Plan revisions required in response to finding of plan inadequacy

Any plan revision for a nonattainment area which is required to be submitted in response to a finding by the Administrator pursuant to section 7410(k)(5) of this title (relating to calls for plan revisions) must correct the plan deficiency (or deficiencies) specified by the Administrator and meet all other applicable plan requirements of section 7410 of this title and this part. The Administrator may reasonably adjust the dates otherwise applicable under such requirements to such revision (except for attainment dates that have not yet elapsed), to the extent necessary to achieve a consistent application of such requirements. In order to facilitate submittal by the States of adequate and approvable plans consistent with the applicable requirements of this chapter, the Administrator shall, as appropriate and from time to time, issue written guidelines, interpretations, and information to the States which shall be available to the public, taking into consideration any such guidelines, interpretations, or information provided before November 15, 1990.

(e) Future modification of standard

If the Administrator relaxes a national primary ambient air quality standard after November 15, 1990, the Administrator shall, within 12 months after the relaxation, promulgate requirements applicable to all areas which have not attained that standard as of the date of such relaxation. Such requirements shall provide for controls which are not less stringent than the controls applicable to areas designated nonattainment before such relaxation.

42 U.S.C. § 7511

§ 7511. Classifications and attainment dates

(a) Classification and attainment dates for 1989 nonattainment areas

(1) Each area designated nonattainment for ozone pursuant to section 7407(d) of this title shall be classified at the time of such designation, under table 1, by operation of law, as a Marginal Area, a Moderate Area, a Serious Area, a Severe Area, or an Extreme Area based on the design value for the area. The design value shall be calculated according to the interpretation methodology issued by the Administrator most recently before November 15, 1990. For each area classified under this subsection, the primary standard attainment date for ozone shall be as expeditiously as practicable but not later than the date provided in table 1.

TABLE 1

Area class	**Design value***	**Primary standard attainment date****
Marginal	0.121 up to 0.138	3 years after November 15, 1990
Moderate	0.138 up to 0.160	6 years after November 15, 1990
Serious	0.160 up to 0.180	9 years after November 15, 1990
Severe	0.180 up to 0.280	15 years after November 15, 1990
Extreme	0.280 and above	20 years after November 15, 1990

(2) Notwithstanding table 1, in the case of a severe area with a 1988 ozone design value between 0.190 and 0.280 ppm, the attainment date shall be 17 years (in lieu of 15 years) after November 15, 1990.

(3) At the time of publication of the notice under section 7407(d)(4) of this title (relating to area designations) for each ozone nonattainment area, the Administrator shall publish a notice announcing the classification of such ozone nonattainment area. The provisions of section 7502(a)(1)(B) of this title (relating to lack of notice and comment and judicial review) shall apply to such classification.

(4) If an area classified under paragraph (1) (Table 1) would have been classified in another category if the design value in the area were 5 percent greater or 5 percent less than the level on which such classification was based, the Administrator may, in the Administrator's discretion, within 90 days after the initial classification, by the procedure required under paragraph (3), adjust the classification to place the area in such other category. In making such adjustment, the Administrator may consider the number of exceedances of the national primary ambient air quality standard for ozone in the area, the level of pollution transport between the area and other affected areas, including both intrastate and interstate transport, and the mix of sources and air pollutants in the area.

(5) Upon application by any State, the Administrator may extend for 1 additional year (hereinafter referred to as the "Extension Year") the date specified in table 1 of paragraph (1) of this subsection if--

(A) the State has complied with all requirements and commitments pertaining to the area in the applicable implementation plan, and

(B) no more than 1 exceedance of the national ambient air quality standard level for ozone has occurred in the area in the year preceding the Extension Year.

No more than 2 one-year extensions may be issued under this paragraph for a single nonattainment area.

(b) New designations and reclassifications

(1) New designations to nonattainment

Any area that is designated attainment or unclassifiable for ozone under section 7407(d)(4) of this title, and that is subsequently redesignated to nonattainment for ozone under section 7407(d)(3) of this title, shall, at the time of the redesignation, be classified by operation of law in accordance with table 1 under subsection (a) of this section. Upon its classification, the area shall be subject to the same requirements under section 7410 of this title, subpart 1 of this part, and this subpart that would have applied had the area been so classified at the time of the notice under subsection (a)(3) of this section, except that any absolute, fixed date

applicable in connection with any such requirement is extended by operation of law by a period equal to the length of time between November 15, 1990, and the date the area is classified under this paragraph.

(2) Reclassification upon failure to attain

(A) Within 6 months following the applicable attainment date (including any extension thereof) for an ozone nonattainment area, the Administrator shall determine, based on the area's design value (as of the attainment date), whether the area attained the standard by that date. Except for any Severe or Extreme area, any area that the Administrator finds has not attained the standard by that date shall be reclassified by operation of law in accordance with table 1 of subsection (a) of this section to the higher of--

(i) the next higher classification for the area, or

(ii) the classification applicable to the area's design value as determined at the time of the notice required under subparagraph (B).

No area shall be reclassified as Extreme under clause (ii).

(B) The Administrator shall publish a notice in the Federal Register, no later than 6 months following the attainment date, identifying each area that the Administrator has determined under subparagraph (A) as having failed to attain and identifying the reclassification, if any, described under subparagraph (A).

(3) Voluntary reclassification

The Administrator shall grant the request of any State to reclassify a nonattainment area in that State in accordance with table 1 of subsection (a) of this section to a higher classification. The Administrator shall publish a notice in the Federal Register of any such request and of action by the Administrator granting the request.

(4) Failure of Severe Areas to attain standard

(A) If any Severe Area fails to achieve the national primary ambient air quality standard for ozone by the applicable attainment date (including any extension thereof), the fee provisions under section 7511d of this title shall apply within the area, the percent reduction requirements of section 7511a(c)(2)(B) and (C) of this title (relating to reasonable further progress demonstration and NO_x control) shall continue to apply to the area, and the State shall demonstrate that such percent

reduction has been achieved in each 3-year interval after such failure until the standard is attained. Any failure to make such a demonstration shall be subject to the sanctions provided under this part.

(B) In addition to the requirements of subparagraph (A), if the ozone design value for a Severe Area referred to in subparagraph (A) is above 0.140 ppm for the year of the applicable attainment date, or if the area has failed to achieve its most recent milestone under section 7511a(g) of this title, the new source review requirements applicable under this subpart in Extreme Areas shall apply in the area and the term[1] "major source" and "major stationary source" shall have the same meaning as in Extreme Areas.

(C) In addition to the requirements of subparagraph (A) for those areas referred to in subparagraph (A) and not covered by subparagraph (B), the provisions referred to in subparagraph (B) shall apply after 3 years from the applicable attainment date unless the area has attained the standard by the end of such 3-year period.

(D) If, after November 15, 1990, the Administrator modifies the method of determining compliance with the national primary ambient air quality standard, a design value or other indicator comparable to 0.140 in terms of its relationship to the standard shall be used in lieu of 0.140 for purposes of applying the provisions of subparagraphs (B) and (C).

(c) References to terms

(1) Any reference in this subpart to a "Marginal Area", a "Moderate Area", a "Serious Area", a "Severe Area", or an "Extreme Area" shall be considered a reference to a Marginal Area, a Moderate Area, a Serious Area, a Severe Area, or an Extreme Area as respectively classified under this section.

(2) Any reference in this subpart to "next higher classification" or comparable terms shall be considered a reference to the classification related to the next higher set of design values in table 1.

42 U.S.C. § 7607

§ 7607. Administrative proceedings and judicial review

(a) Administrative subpenas; confidentiality; witnesses

In connection with any determination under section 7410(f) of this title, or for purposes of obtaining information under section 7521(b)(4) or 7545(c)(3) of this title, any investigation, monitoring, reporting requirement, entry, compliance inspection, or administrative enforcement proceeding under the[1] chapter (including but not limited to section 7413, section 7414, section 7420, section 7429, section 7477, section 7524, section 7525, section 7542, section 7603, or section 7606 of this title),,[2] the Administrator may issue subpenas for the attendance and testimony of witnesses and the production of relevant papers, books, and documents, and he may administer oaths. Except for emission data, upon a showing satisfactory to the Administrator by such owner or operator that such papers, books, documents, or information or particular part thereof, if made public, would divulge trade secrets or secret processes of such owner or operator, the Administrator shall consider such record, report, or information or particular portion thereof confidential in accordance with the purposes of section 1905 of Title 18, except that such paper, book, document, or information may be disclosed to other officers, employees, or authorized representatives of the United States concerned with carrying out this chapter, to persons carrying out the National Academy of Sciences' study and investigation provided for in section 7521(c) of this title, or when relevant in any proceeding under this chapter. Witnesses summoned shall be paid the same fees and mileage that are paid witnesses in the courts of the United States. In case of contumacy or refusal to obey a subpena served upon any person under this subparagraph, the district court of the United States for any district in which such person is found or resides or transacts business, upon application by the United States and after notice to such person, shall have jurisdiction to issue an order requiring such person to appear and give testimony before the Administrator to appear and produce papers, books, and documents before the Administrator, or both, and any failure to obey such order of the court may be punished by such court as a contempt thereof.

(b) Judicial review

(1) A petition for review of action of the Administrator in promulgating any national primary or secondary ambient air quality standard, any emission standard or requirement under section 7412 of this title, any standard of performance or requirement under section 7411 of this title,,[2] any standard under section 7521 of

this title (other than a standard required to be prescribed under section 7521(b)(1) of this title), any determination under section 7521(b)(5) of this title, any control or prohibition under section 7545 of this title, any standard under section 7571 of this title, any rule issued under section 7413, 7419, or under section 7420 of this title, or any other nationally applicable regulations promulgated, or final action taken, by the Administrator under this chapter may be filed only in the United States Court of Appeals for the District of Columbia. A petition for review of the Administrator's action in approving or promulgating any implementation plan under section 7410 of this title or section 7411(d) of this title, any order under section 7411(j) of this title, under section 7412 of this title, under section 7419 of this title, or under section 7420 of this title, or his action under section 1857c-10(c)(2)(A), (B), or (C) of this title (as in effect before August 7, 1977) or under regulations thereunder, or revising regulations for enhanced monitoring and compliance certification programs under section 7414(a)(3) of this title, or any other final action of the Administrator under this chapter (including any denial or disapproval by the Administrator under subchapter I of this chapter) which is locally or regionally applicable may be filed only in the United States Court of Appeals for the appropriate circuit. Notwithstanding the preceding sentence a petition for review of any action referred to in such sentence may be filed only in the United States Court of Appeals for the District of Columbia if such action is based on a determination of nationwide scope or effect and if in taking such action the Administrator finds and publishes that such action is based on such a determination. Any petition for review under this subsection shall be filed within sixty days from the date notice of such promulgation, approval, or action appears in the Federal Register, except that if such petition is based solely on grounds arising after such sixtieth day, then any petition for review under this subsection shall be filed within sixty days after such grounds arise. The filing of a petition for reconsideration by the Administrator of any otherwise final rule or action shall not affect the finality of such rule or action for purposes of judicial review nor extend the time within which a petition for judicial review of such rule or action under this section may be filed, and shall not postpone the effectiveness of such rule or action.

(2) Action of the Administrator with respect to which review could have been obtained under paragraph (1) shall not be subject to judicial review in civil or criminal proceedings for enforcement. Where a final decision by the Administrator defers performance of any nondiscretionary statutory action to a later time, any person may challenge the deferral pursuant to paragraph (1).

(c) Additional evidence

In any judicial proceeding in which review is sought of a determination under this chapter required to be made on the record after notice and opportunity for hearing, if any party applies to the court for leave to adduce additional evidence, and shows to the satisfaction of the court that such additional evidence is material and that there were reasonable grounds for the failure to adduce such evidence in the proceeding before the Administrator, the court may order such additional evidence (and evidence in rebuttal thereof) to be taken before the Administrator, in such manner and upon such terms and conditions as to[3] the court may deem proper. The Administrator may modify his findings as to the facts, or make new findings, by reason of the additional evidence so taken and he shall file such modified or new findings, and his recommendation, if any, for the modification or setting aside of his original determination, with the return of such additional evidence.

(d) Rulemaking

(1) This subsection applies to--

(A) the promulgation or revision of any national ambient air quality standard under section 7409 of this title,

(B) the promulgation or revision of an implementation plan by the Administrator under section 7410(c) of this title,

(C) the promulgation or revision of any standard of performance under section 7411 of this title, or emission standard or limitation under section 7412(d) of this title, any standard under section 7412(f) of this title, or any regulation under section 7412(g)(1)(D) and (F) of this title, or any regulation under section 7412(m) or (n) of this title,

(D) the promulgation of any requirement for solid waste combustion under section 7429 of this title,

(E) the promulgation or revision of any regulation pertaining to any fuel or fuel additive under section 7545 of this title,

(F) the promulgation or revision of any aircraft emission standard under section 7571 of this title,

(G) the promulgation or revision of any regulation under subchapter IV-A of this chapter (relating to control of acid deposition),

(H) promulgation or revision of regulations pertaining to primary nonferrous smelter orders under section 7419 of this title (but not including the granting or denying of any such order),

(I) promulgation or revision of regulations under subchapter VI of this chapter (relating to stratosphere and ozone protection),

(J) promulgation or revision of regulations under part C of subchapter I of this chapter (relating to prevention of significant deterioration of air quality and protection of visibility),

(K) promulgation or revision of regulations under section 7521 of this title and test procedures for new motor vehicles or engines under section 7525 of this title, and the revision of a standard under section 7521(a)(3) of this title,

(L) promulgation or revision of regulations for noncompliance penalties under section 7420 of this title,

(M) promulgation or revision of any regulations promulgated under section 7541 of this title (relating to warranties and compliance by vehicles in actual use),

(N) action of the Administrator under section 7426 of this title (relating to interstate pollution abatement),

(O) the promulgation or revision of any regulation pertaining to consumer and commercial products under section 7511b(e) of this title,

(P) the promulgation or revision of any regulation pertaining to field citations under section 7413(d)(3) of this title,

(Q) the promulgation or revision of any regulation pertaining to urban buses or the clean-fuel vehicle, clean-fuel fleet, and clean fuel programs under part C of subchapter II of this chapter,

(R) the promulgation or revision of any regulation pertaining to nonroad engines or nonroad vehicles under section 7547 of this title,

(S) the promulgation or revision of any regulation relating to motor vehicle compliance program fees under section 7552 of this title,

(T) the promulgation or revision of any regulation under subchapter IV-A of this chapter (relating to acid deposition),

(U) the promulgation or revision of any regulation under section 7511b(f) of this title pertaining to marine vessels, and

(V) such other actions as the Administrator may determine.

The provisions of section 553 through 557 and section 706 of Title 5 shall not, except as expressly provided in this subsection, apply to actions to which this subsection applies. This subsection shall not apply in the case of any rule or circumstance referred to in subparagraphs (A) or (B) of subsection 553(b) of Title 5.

(2) Not later than the date of proposal of any action to which this subsection applies, the Administrator shall establish a rulemaking docket for such action (hereinafter in this subsection referred to as a "rule"). Whenever a rule applies only within a particular State, a second (identical) docket shall be simultaneously established in the appropriate regional office of the Environmental Protection Agency.

(3) In the case of any rule to which this subsection applies, notice of proposed rulemaking shall be published in the Federal Register, as provided under section 553(b) of Title 5, shall be accompanied by a statement of its basis and purpose and shall specify the period available for public comment (hereinafter referred to as the "comment period"). The notice of proposed rulemaking shall also state the docket number, the location or locations of the docket, and the times it will be open to public inspection. The statement of basis and purpose shall include a summary of--

(A) the factual data on which the proposed rule is based;

(B) the methodology used in obtaining the data and in analyzing the data; and

(C) the major legal interpretations and policy considerations underlying the proposed rule.

The statement shall also set forth or summarize and provide a reference to any pertinent findings, recommendations, and comments by the Scientific Review Committee established under section 7409(d) of this title and the National Academy of Sciences, and, if the proposal differs in any important respect from any of these recommendations, an explanation of the reasons for such differences. All data, information, and documents referred to in this paragraph on which the proposed rule relies shall be included in the docket on the date of publication of the proposed rule.

(4)(A) The rulemaking docket required under paragraph (2) shall be open for inspection by the public at reasonable times specified in the notice of proposed rulemaking. Any person may copy documents contained in the docket. The Administrator shall provide copying facilities which may be used at the expense of the person seeking copies, but the Administrator may waive or reduce such expenses in such instances as the public interest requires. Any person may request copies by mail if the person pays the expenses, including personnel costs to do the copying.

(B)(i) Promptly upon receipt by the agency, all written comments and documentary information on the proposed rule received from any person for inclusion in the docket during the comment period shall be placed in the docket. The transcript of public hearings, if any, on the proposed rule shall also be included in the docket promptly upon receipt from the person who transcribed such hearings. All documents which become available after the proposed rule has been published and which the Administrator determines are of central relevance to the rulemaking shall be placed in the docket as soon as possible after their availability.

(ii) The drafts of proposed rules submitted by the Administrator to the Office of Management and Budget for any interagency review process prior to proposal of any such rule, all documents accompanying such drafts, and all written comments thereon by other agencies and all written responses to such written comments by the Administrator shall be placed in the docket no later than the date of proposal of the rule. The drafts of the final rule submitted for such review process prior to promulgation and all such written comments thereon, all documents accompanying such drafts, and written responses thereto shall be placed in the docket no later than the date of promulgation.

(5) In promulgating a rule to which this subsection applies (i) the Administrator shall allow any person to submit written comments, data, or documentary information; (ii) the Administrator shall give interested persons an opportunity for the oral presentation of data, views, or arguments, in addition to an opportunity to make written submissions; (iii) a transcript shall be kept of any oral presentation; and (iv) the Administrator shall keep the record of such proceeding open for thirty days after completion of the proceeding to provide an opportunity for submission of rebuttal and supplementary information.

(6)(A) The promulgated rule shall be accompanied by (i) a statement of basis and purpose like that referred to in paragraph (3) with respect to a proposed rule and (ii) an explanation of the reasons for any major changes in the promulgated rule from the proposed rule.

(B) The promulgated rule shall also be accompanied by a response to each of the significant comments, criticisms, and new data submitted in written or oral presentations during the comment period.

(C) The promulgated rule may not be based (in part or whole) on any information or data which has not been placed in the docket as of the date of such promulgation.

(7)(A) The record for judicial review shall consist exclusively of the material referred to in paragraph (3), clause (i) of paragraph (4)(B), and subparagraphs (A) and (B) of paragraph (6).

(B) Only an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review. If the person raising an objection can demonstrate to the Administrator that it was impracticable to raise such objection within such time or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule, the Administrator shall convene a proceeding for reconsideration of the rule and provide the same procedural rights as would have been afforded had the information been available at the time the rule was proposed. If the Administrator refuses to convene such a proceeding, such person may seek review of such refusal in the United States court of appeals for the appropriate circuit (as provided in subsection (b) of this section). Such reconsideration shall not postpone the effectiveness of the rule. The effectiveness of the rule may be stayed during such reconsideration, however, by the Administrator or the court for a period not to exceed three months.

(8) The sole forum for challenging procedural determinations made by the Administrator under this subsection shall be in the United States court of appeals for the appropriate circuit (as provided in subsection (b) of this section) at the time of the substantive review of the rule. No interlocutory appeals shall be permitted with respect to such procedural determinations. In reviewing alleged procedural errors, the court may invalidate the rule only if the errors were so serious and related to matters of such central relevance to the rule that there is a substantial likelihood that the rule would have been significantly changed if such errors had not been made.

(9) In the case of review of any action of the Administrator to which this subsection applies, the court may reverse any such action found to be--

(A) arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law;

(B) contrary to constitutional right, power, privilege, or immunity;

(C) in excess of statutory jurisdiction, authority, or limitations, or short of statutory right; or

(D) without observance of procedure required by law, if (i) such failure to observe such procedure is arbitrary or capricious, (ii) the requirement of paragraph (7)(B) has been met, and (iii) the condition of the last sentence of paragraph (8) is met.

(10) Each statutory deadline for promulgation of rules to which this subsection applies which requires promulgation less than six months after date of proposal may be extended to not more than six months after date of proposal by the Administrator upon a determination that such extension is necessary to afford the public, and the agency, adequate opportunity to carry out the purposes of this subsection.

(11) The requirements of this subsection shall take effect with respect to any rule the proposal of which occurs after ninety days after August 7, 1977.

(e) Other methods of judicial review not authorized

Nothing in this chapter shall be construed to authorize judicial review of regulations or orders of the Administrator under this chapter, except as provided in this section.

(f) Costs

In any judicial proceeding under this section, the court may award costs of litigation (including reasonable attorney and expert witness fees) whenever it determines that such award is appropriate.

(g) Stay, injunction, or similar relief in proceedings relating to noncompliance penalties

In any action respecting the promulgation of regulations under section 7420 of this title or the administration or enforcement of section 7420 of this title no court shall grant any stay, injunctive, or similar relief before final judgment by such court in such action.

(h) Public participation

It is the intent of Congress that, consistent with the policy of subchapter II of chapter 5 of Title 5, the Administrator in promulgating any regulation under this chapter, including a regulation subject to a deadline, shall ensure a reasonable period for public participation of at least 30 days, except as otherwise expressly provided in section[4] 7407(d), 7502(a), 7511(a) and (b), and 7512(a) and (b) of this title.

42 U.S.C.A. § 7619

§ 7619. Air quality monitoring

(a) In general

After notice and opportunity for public hearing, the Administrator shall promulgate regulations establishing an air quality monitoring system throughout the United States which--

(1) utilizes uniform air quality monitoring criteria and methodology and measures such air quality according to a uniform air quality index,

(2) 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,

(3) provides for daily analysis and reporting of air quality based upon such uniform air quality index, and

(4) 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.

The operation of such air quality monitoring system may be carried out by the Administrator or by such other departments, agencies, or entities of the Federal Government (including the National Weather Service) as the President may deem appropriate. Any air quality monitoring system required under any applicable implementation plan under section 7410 of this title shall, as soon as practicable following promulgation of regulations under this section, utilize the standard criteria and methodology, and measure air quality according to the standard index, established under such regulations.

(b) Air quality monitoring data influenced by exceptional events

(1) Definition of exceptional event

In this section:

(A) In general

The term “exceptional event” means an event that--

(i) affects air quality;

(ii) is not reasonably controllable or preventable;

(iii) is an event caused by human activity that is unlikely to recur at a particular location or a natural event; and

(iv) is determined by the Administrator through the process established in the regulations promulgated under paragraph (2) to be an exceptional event.

(B) Exclusions

In this subsection, the term "exceptional event" does not include--

(i) stagnation of air masses or meteorological inversions;

(ii) a meteorological event involving high temperatures or lack of precipitation; or

(iii) air pollution relating to source noncompliance.

(2) Regulations

(A) Proposed regulations

Not later than March 1, 2006, after consultation with Federal land managers and State air pollution control agencies, the Administrator shall publish in the Federal Register proposed regulations governing the review and handling of air quality monitoring data influenced by exceptional events.

(B) Final regulations

Not later than 1 year after the date on which the Administrator publishes proposed regulations under subparagraph (A), and after providing an opportunity for interested persons to make oral presentations of views, data, and arguments regarding the proposed regulations, the Administrator shall promulgate final regulations governing the review and handling or air quality monitoring data influenced by an exceptional event that are consistent with paragraph (3).

(3) Principles and requirements

(A) Principles

In promulgating regulations under this section, the Administrator shall follow--

(i) the principle that protection of public health is the highest priority;

(ii) the principle that timely information should be provided to the public in any case in which the air quality is unhealthy;

(iii) the principle that all ambient air quality data should be included in a timely manner, an appropriate Federal air quality database that is accessible to the public;

(iv) the principle that each State must take necessary measures to safeguard public health regardless of the source of the air pollution; and

(v) the principle that air quality data should be carefully screened to ensure that events not likely to recur are represented accurately in all monitoring data and analyses.

(B) Requirements

Regulations promulgated under this section shall, at a minimum, provide that--

(i) the occurrence of an exceptional event must be demonstrated by reliable, accurate data that is promptly produced and provided by Federal, State, or local government agencies;

(ii) a clear causal relationship must exist between the measured exceedances of a national ambient air quality standard and the exceptional event to demonstrate that the exceptional event caused a specific air pollution concentration at a particular air quality monitoring location;

(iii) there is a public process for determining whether an event is exceptional; and

(iv) there are criteria and procedures for the Governor of a State to petition the Administrator to exclude air quality monitoring data that is directly due to exceptional events from use in determinations by the Administrator with respect to exceedances or violations of the national ambient air quality standards.

(4) Interim provision

Until the effective date of a regulation promulgated under paragraph (2), the following guidance issued by the Administrator shall continue to apply:

(A) Guidance on the identification and use of air quality data affected by exceptional events (July 1986).

(B) Areas affected by PM-10 natural events, May 30, 1996.

(C) Appendices I, K, and N to part 50 of title 40, Code of Federal Regulations.

40 C.F.R. § 50.15

§ 50.15 National primary and secondary ambient air quality standards for ozone.

(a) The level of the national 8–hour primary and secondary ambient air quality standards for ozone (O_3) is 0.075 parts per million (ppm), daily maximum 8–hour average, measured by a reference method based on Appendix D to this part and designated in accordance with part 53 of this chapter or an equivalent method designated in accordance with part 53 of this chapter.

(b) The 8–hour primary and secondary O_3 ambient air quality standards are met at an ambient air quality monitoring site when the 3–year average of the annual fourth-highest daily maximum 8–hour average O_3 concentration is less than or equal to 0.075 ppm, as determined in accordance with Appendix P to this part.

40 C.F.R. Pt. 50, App. P

Appendix P to Part 50--Interpretation of the Primary and Secondary National Ambient Air Quality Standards for Ozone

1. General

(a) This appendix explains the data handling conventions and computations necessary for determining whether the national 8–hour primary and secondary ambient air quality standards for ozone (O_3) specified in § 50.15 are met at an ambient O_3 air quality monitoring site. Ozone is measured in the ambient air by a reference method based on Appendix D of this part, as applicable, and designated in accordance with part 53 of this chapter, or by an equivalent method designated in accordance with part 53 of this chapter. Data reporting, data handling, and computation procedures to be used in making comparisons between reported O_3 concentrations and the levels of the O_3 standards are specified in the following sections. Whether to exclude, retain, or make adjustments to the data affected by exceptional events, including stratospheric O_3 intrusion and other natural events, is determined by the requirements under §§ 50.1, 50.14 and 51.930.

(b) The terms used in this appendix are defined as follows:

8–hour average is the rolling average of eight hourly O_3 concentrations as explained in section 2 of this appendix.

Annual fourth-highest daily maximum refers to the fourth highest value measured at a monitoring site during a particular year.

Daily maximum 8–hour average concentration refers to the maximum calculated 8–hour average for a particular day as explained in section 2 of this appendix.

Design values are the metrics (i.e., statistics) that are compared to the NAAQS levels to determine compliance, calculated as shown in section 3 of this appendix.

O_3 monitoring season refers to the span of time within a calendar year when individual States are required to measure ambient O_3 concentrations as listed in part 58 Appendix D to this chapter.

Year refers to calendar year.

2. Primary and Secondary Ambient Air Quality Standards for Ozone

2.1 Data Reporting and Handling Conventions

Computing 8–hour averages. Hourly average concentrations shall be reported in parts per million (ppm) to the third decimal place, with additional digits to the right of the third decimal place truncated. Running 8–hour averages shall be computed from the hourly O_3 concentration data for each hour of the year and shall be stored in the first, or start, hour of the 8–hour period. An 8–hour average shall be considered valid if at least 75% of the hourly averages for the 8–hour period are available. In the event that only 6 or 7 hourly averages are available, the 8–hour average shall be computed on the basis of the hours available using 6 or 7 as the divisor. 8–hour periods with three or more missing hours shall be considered valid also, if, after substituting one-half the minimum detectable limit for the missing hourly concentrations, the 8–hour average concentration is greater than the level of the standard. The computed 8–hour average O_3 concentrations shall be reported to three decimal places (the digits to the right of the third decimal place are truncated, consistent with the data handling procedures for the reported data).

Daily maximum 8–hour average concentrations. (a) There are 24 possible running 8–hour average O_3 concentrations for each calendar day during the O_3 monitoring season. The daily maximum 8–hour concentration for a given calendar day is the highest of the 24 possible 8–hour average concentrations computed for that day. This process is repeated, yielding a daily maximum 8–hour average O_3 concentration for each calendar day with ambient O_3 monitoring data. Because the 8–hour averages are recorded in the start hour, the daily maximum 8–hour concentrations from two consecutive days may have some hourly concentrations in common. Generally, overlapping daily maximum 8–hour averages are not likely, except in those non-urban monitoring locations with less pronounced diurnal variation in hourly concentrations.

(b) An O_3 monitoring day shall be counted as a valid day if valid 8–hour averages are available for at least 75% of possible hours in the day (i.e., at least 18 of the 24 averages). In the event that less than 75% of the 8–hour averages are available, a day shall also be counted as a valid day if the daily maximum 8–hour average concentration for that day is greater than the level of the standard.

2.2 Primary and Secondary Standard-related Summary Statistic

The standard-related summary statistic is the annual fourth-highest daily maximum 8–hour O_3 concentration, expressed in parts per million, averaged over three years. The 3–year average shall be computed using the three most recent, consecutive calendar years of monitoring data meeting the data completeness requirements described in this appendix. The computed 3–year average of the annual fourth-highest daily maximum 8–hour average O_3 concentrations shall be reported to

three decimal places (the digits to the right of the third decimal place are truncated, consistent with the data handling procedures for the reported data).

2.3 Comparisons with the Primary and Secondary Ozone Standards

(a) The primary and secondary O_3 ambient air quality standards are met at an ambient air quality monitoring site when the 3–year average of the annual fourth-highest daily maximum 8–hour average O_3 concentration is less than or equal to 0.075 ppm.

(b) This comparison shall be based on three consecutive, complete calendar years of air quality monitoring data. This requirement is met for the 3–year period at a monitoring site if daily maximum 8–hour average concentrations are available for at least 90% of the days within the O_3 monitoring season, on average, for the 3–year period, with a minimum data completeness requirement in any one year of at least 75% of the days within the O_3 monitoring season. When computing whether the minimum data completeness requirements have been met, meteorological or ambient data may be sufficient to demonstrate that meteorological conditions on missing days were not conducive to concentrations above the level of the standard. Missing days assumed less then the level of the standard are counted for the purpose of meeting the data completeness requirement, subject to the approval of the appropriate Regional Administrator.

(c) Years with concentrations greater than the level of the standard shall be included even if they have less than complete data. Thus, in computing the 3–year average fourth maximum concentration, calendar years with less than 75% data completeness shall be included in the computation if the 3–year average fourth-highest 8–hour concentration is greater than the level of the standard.

(d) Comparisons with the primary and secondary O_3 standards are demonstrated by examples 1 and 2 in paragraphs (d)(1) and (d)(2) respectively as follows:

Example 1.--Ambient Monitoring Site Attaining the Primary and Secondary O_3 Standards

Year	Percent valid days (within the required monitoring season)	1st Highest daily max 8-hour Conc. (ppm)	2nd Highest daily max 8-hour Conc. (ppm)	3rd Highest daily max 8-hour Conc. (ppm)	4th Highest daily max 8-hour Conc. (ppm)	5th Highest daily max 8-hour Conc. (ppm)
2004	100	0.092	0.090	0.085	0.079	0.078
2005	96	0.084	0.083	0.075	0.072	0.070
2006	98	0.080	0.079	0.077	0.076	0.060
Average	98				0.075	

(1) As shown in Example 1, this monitoring site meets the primary and secondary O_3 standards because the 3–year average of the annual fourth-highest daily maximum 8–hour average O_3 concentrations (i.e., 0.075666 * * * ppm, truncated to 0.075 ppm) is less than or equal to 0.075 ppm. The data completeness requirement is also met because the average percent of days within the required monitoring season with valid ambient monitoring data is greater than 90%, and no single year has less than 75% data completeness. In Example 1, the individual 8–hour averages used to determine the annual fourth maximum have also been truncated to the third decimal place.

Example 2.--Ambient Monitoring Site Failing to Meet the Primary and Secondary O_3 Standards

Year	Percent valid days (within the required monitoring season)	1st Highest daily max 8-hour Conc. (ppm)	2nd Highest daily max 8-hour Conc. (ppm)	3rd Highest daily max 8-hour Conc. (ppm)	4th Highest daily max 8-hour Conc. (ppm)	5th Highest daily max 8-hour Conc. (ppm)
2004	96	0.105	0.103	0.103	0.103	0.102
2005	74	0.104	0.103	0.092	0.091	0.088
2006	98	0.103	0.101	0.101	0.095	0.094
Average	89				0.096	

As shown in Example 2, the primary and secondary O_3 standards are not met for this monitoring site because the 3–year average of the fourth-highest daily maximum 8–hour average O_3 concentrations (i.e., 0.096333 * * * ppm, truncated to 0.096 ppm) is greater than 0.075 ppm, even though the data capture is less than 75% and the average data capture for the 3 years is less than 90% within the required monitoring season. In Example 2, the individual 8–hour averages used to determine the annual fourth maximum have also been truncated to the third decimal place.

3. Design Values for Primary and Secondary Ambient Air Quality Standards for Ozone

The air quality design value at a monitoring site is defined as that concentration that when reduced to the level of the standard ensures that the site meets the standard. For a concentration-based standard, the air quality design value is simply the standard-related test statistic. Thus, for the primary and secondary standards,

the 3–year average annual fourth-highest daily maximum 8–hour average O_3 concentration is also the air quality design value for the site.

40 C.F.R. § 58.2

§ 58.2 Purpose.

(a) This part contains requirements for measuring ambient air quality and for reporting ambient air quality data and related information. The monitoring criteria pertain to the following areas:

(1) Quality assurance procedures for monitor operation and data handling.

(2) Methodology used in monitoring stations.

(3) Operating schedule.

(4) Siting parameters for instruments or instrument probes.

(5) Minimum ambient air quality monitoring network requirements used to provide support to the State implementation plans (SIP), national air quality assessments, and policy decisions. These minimums are described as part of the network design requirements, including minimum numbers and placement of monitors of each type.

(6) Air quality data reporting, and requirements for the daily reporting of an index of ambient air quality.

(b) The requirements pertaining to provisions for an air quality surveillance system in the SIP are contained in this part.

(c) This part also acts to establish a national ambient air quality monitoring network for the purpose of providing timely air quality data upon which to base national assessments and policy decisions.

40 C.F.R. § 58.15

§ 58.15 Annual air monitoring data certification.

(a) The State, or where appropriate local, agency shall submit to the EPA Regional Administrator an annual air monitoring data certification letter to certify data collected at all SLAMS and at all FRM, FEM, and ARM SPM stations that meet criteria in appendix A to this part from January 1 to December 31 of the previous year. The senior air pollution control officer in each agency, or his or her designee, shall certify that the previous year of ambient concentration and quality assurance data are completely submitted to AQS and that the ambient concentration data are accurate to the best of her or his knowledge, taking into consideration the quality assurance findings.

(1) Through 2009, the annual data certification letter is due by July 1 of each year.

(2) Beginning in 2010, the annual data certification letter is due by May 1 of each year.

(b) Along with each certification letter, the State shall submit to the Administrator (through the appropriate Regional Office) an annual summary report of all the ambient air quality data collected at all SLAMS and at SPM stations using FRM, FEM, or ARMs. The annual report(s) shall be submitted for data collected from January 1 to December 31 of the previous year. The annual summary report(s) must contain all information and data required by the State's approved plan and must be submitted on the same schedule as the certification letter, unless an approved alternative date is included in the plan. The annual summary serves as the record of the specific data that is the object of the certification letter.

(c) Along with each certification letter, the State shall submit to the Administrator (through the appropriate Regional Office) a summary of the precision and accuracy data for all ambient air quality data collected at all SLAMS and at SPM stations using FRM, FEM, or ARMs. The summary of precision and accuracy shall be submitted for data collected from January 1 to December 31 of the previous year. The summary of precision and accuracy must be submitted on the same schedule as the certification letter, unless an approved alternative date is included in the plan.

40 C.F.R. § 58.16

§ 58.16 Data submittal and archiving requirements.

(a) The state, or where appropriate, local agency, shall report to the Administrator, via AQS all ambient air quality data and associated quality assurance data for SO_2 ; CO; O_3 ; NO_2 ; NO; NOy; NO_X ; Pb–TSP mass concentration; Pb–PM_{10} mass concentration; PM_{10} mass concentration; $PM_{2.5}$ mass concentration; for filter-based $PM_{2.5}$ FRM/FEM the field blank mass, sampler-generated average daily temperature, and sampler-generated average daily pressure; chemically speciated $PM_{2.5}$ mass concentration data; $PM_{10–2.5}$ mass concentration; meteorological data from NCore and PAMS sites; average daily temperature and average daily pressure for Pb sites if not already reported from sampler generated records; and metadata records and information specified by the AQS Data Coding Manual (http://www.epa.gov/ttn/airs/airsaqs/manuals/manuals.htm). The state, or where appropriate, local agency, may report site specific meteorological measurements generated by onsite equipment (meteorological instruments, or sampler generated) or measurements from the nearest airport reporting ambient pressure and temperature. Such air quality data and information must be submitted directly to the AQS via electronic transmission on the specified quarterly schedule described in paragraph (b) of this section.

(b) The specific quarterly reporting periods are January 1–March 31, April 1–June 30, July 1–September 30, and October 1–December 31. The data and information reported for each reporting period must contain all data and information gathered during the reporting period, and be received in the AQS within 90 days after the end of the quarterly reporting period. For example, the data for the reporting period January 1–March 31 are due on or before June 30 of that year.

(c) Air quality data submitted for each reporting period must be edited, validated, and entered into the AQS (within the time limits specified in paragraph (b) of this section) pursuant to appropriate AQS procedures. The procedures for editing and validating data are described in the AQS Data Coding Manual and in each monitoring agency's quality assurance project plan.

(d) The State shall report VOC and if collected, carbonyl, NH_3, and HNO_3 data, from PAMS sites to AQS within 6 months following the end of each quarterly reporting period listed in paragraph (b) of this section.

(e) The State shall also submit any portion or all of the SLAMS and SPM data to the appropriate Regional Administrator upon request.

(f) The state, or where applicable, local agency shall archive all $PM_{2.5}$, PM_{10}, and $PM_{10–2.5}$ filters from manual low-volume samplers (samplers having flow rates less than 200 liters/minute) from all SLAMS sites for a minimum period of 5 years after collection. These filters shall be made available for supplemental analyses, including destructive analyses if necessary, at the request of EPA or to provide information to state and local agencies on particulate matter composition. Other Federal agencies may request access to filters for purposes of supporting air quality management or community health--such as biological assay--through the applicable EPA Regional Administrator. The filters shall be archived according to procedures approved by the Administrator, which shall include cold storage of filters after post-sampling laboratory analyses for at least 12 months following field sampling. The EPA recommends that particulate matter filters be archived for longer periods, especially for key sites in making NAAQS–related decisions or for supporting health-related air pollution studies.

(g) Any State or, where applicable, local agency operating a continuous SO_2 analyzer shall report the maximum 5–minute SO_2 block average of the twelve 5–minute block averages in each hour, in addition to the hourly SO_2 average.

40 C.F.R. § 58, App. A

APPENDIX A TO PART 58--QUALITY ASSURANCE REQUIREMENTS FOR SLAMS, SPMS AND PSD AIR MONITORING

1. General Information.

(a) Each monitoring organization is required to implement a quality system that provides sufficient information to assess the quality of the monitoring data. The quality system must, at a minimum, include the specific requirements described in this appendix of this subpart. Failure to conduct or pass a required check or procedure, or a series of required checks or procedures, does not by itself invalidate data for regulatory decision making. Rather, monitoring agencies and EPA shall use the checks and procedures required in this appendix in combination with other data quality information, reports, and similar documents showing overall compliance with part 58. Accordingly, EPA and monitoring agencies shall use a "weight of evidence" approach when determining the suitability of data for regulatory decisions. The EPA reserves the authority to use or not use monitoring data submitted by a monitoring organization when making regulatory decisions based on the EPA's assessment of the quality of the data. Generally, consensus built validation templates or validation criteria already approved in Quality Assurance Project Plans (QAPPs) should be used as the basis for the weight of evidence approach.

(b) This appendix specifies the minimum quality system requirements applicable to SLAMS air monitoring data and PSD data for the pollutants SO_2, NO_2, O_3, CO, Pb, $PM_{2.5}$, PM_{10} and $PM_{10-2.5}$ submitted to EPA. This appendix also applies to all SPM stations using FRM, FEM, or ARM methods which also meet the requirements of appendix E of this part, unless alternatives to this appendix for SPMs have been approved in accordance with § 58.11(a)(2). Monitoring organizations are

encouraged to develop and maintain quality systems more extensive than the required minimums. The permit-granting authority for PSD may require more frequent or more stringent requirements. Monitoring organizations may, based on their quality objectives, develop and maintain quality systems beyond the required minimum. Additional guidance for the requirements reflected in this appendix can be found in the "Quality Assurance Handbook for Air Pollution Measurement Systems", Volume II (see reference 10 of this appendix) and at a national level in references 1, 2, and 3 of this appendix.

1.1 Similarities and Differences Between SLAMS and PSD Monitoring. In most cases, the quality assurance requirements for SLAMS, SPMs if applicable, and PSD are the same. Affected SPMs are subject to all the SLAMS requirements, even where not specifically stated in each section. Table A–1 of this appendix summarizes the major similarities and differences of the requirements for SLAMS and PSD. Both programs require:

(a) The development, documentation, and implementation of an approved quality system;

(b) The assessment of data quality;

(c) The use of reference, equivalent, or approved methods. The requirements of this appendix do not apply to a SPM that does not use a FRM, FEM, or ARM;

(d) The use of calibration standards traceable to NIST or other primary standard;

(e) Performance evaluations and systems.

1.1.1 The monitoring and quality assurance responsibilities for SLAMS are with the State or local agency, hereafter called the monitoring organization, whereas for PSD they are with the owner/operator seeking the permit. The monitoring duration for SLAMS is indefinite, whereas for PSD the duration is usually 12 months. Whereas the reporting period for precision and accuracy data is on an annual or calendar quarter basis for SLAMS, it is on a continuing sampler quarter basis for PSD, since the monitoring may not commence at the beginning of a calendar quarter.

1.1.2 The annual performance evaluations (described in section 3.2.2 of this appendix) for PSD must be conducted by personnel different from those who perform routine span checks and calibrations, whereas for SLAMS, it is the preferred but not the required condition. For PSD, the evaluation rate is 100 percent of the sites per reporting quarter whereas for SLAMS it is 25 percent of the

sites or instruments quarterly. Monitoring for sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) for PSD must be done with automated analyzers--the manual bubbler methods are not permitted.

1.1.3 The requirements for precision assessment for the automated methods are the same for both SLAMS and PSD. However, for manual methods, only one collocated site is required for PSD.

1.1.4 The precision, accuracy and bias data for PSD are reported separately for each sampler (site), whereas for SLAMS, the report may be by sampler (site), by primary quality assurance organization, or nationally, depending on the pollutant. SLAMS data are required to be reported to the AQS, PSD data are required to be reported to the permit-granting authority. Requirements in this appendix, with the exception of the differences discussed in this section, and in Table A–1 of this appendix will be expected to be followed by both SLAMS and PSD networks unless directly specified in a particular section.

1.2 Measurement Uncertainty. Measurement uncertainty is a term used to describe deviations from a true concentration or estimate that are related to the measurement process and not to spatial or temporal population attributes of the air being measured. Monitoring organizations must develop quality assurance project plans (QAPP) which describe how the organization intends to control measurement uncertainty to an appropriate level in order to achieve the objectives for which the data are collected. The process by which one determines the quality of data needed to meet the monitoring objective is sometimes referred to the Data Quality Objectives Process. Data quality indicators associated with measurement uncertainty include:

(a) Precision. A measurement of mutual agreement among individual measurements of the same property usually under prescribed similar conditions, expressed generally in terms of the standard deviation.

(b) Bias. The systematic or persistent distortion of a measurement process which causes errors in one direction.

(c) Accuracy. The degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of random error (imprecision) and systematic error (bias) components which are due to sampling and analytical operations.

(d) Completeness. A measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct, normal conditions.

(e) Detectability. The low critical range value of a characteristic that a method specific procedure can reliably discern.

1.3 Measurement Quality Checks. The SLAMS measurement quality checks described in sections 3.2 and 3.3 of this appendix shall be reported to AQS and are included in the data required for certification. The PSD network is required to implement the measurement quality checks and submit this information quarterly along with assessment information to the permit-granting authority.

1.4 Assessments and Reports. Periodic assessments and documentation of data quality are required to be reported to EPA or to the permit granting authority (PSD). To provide national uniformity in this assessment and reporting of data quality for all networks, specific assessment and reporting procedures are prescribed in detail in sections 3, 4, and 5 of this appendix. On the other hand, the selection and extent of the quality assurance and quality control activities used by a monitoring organization depend on a number of local factors such as field and laboratory conditions, the objectives for monitoring, the level of data quality needed, the expertise of assigned personnel, the cost of control procedures, pollutant concentration levels, etc. Therefore, quality system requirements in section 2 of this appendix are specified in general terms to allow each monitoring organization to develop a quality system that is most efficient and effective for its own circumstances while achieving the data quality objectives required for the SLAMS sites.

2. Quality System Requirements

A quality system is the means by which an organization manages the quality of the monitoring information it produces in a systematic, organized manner. It provides a framework for planning, implementing, assessing and reporting work performed by an organization and for carrying out required quality assurance and quality control activities.

2.1 Quality Management Plans and Quality Assurance Project Plans. All monitoring organizations must develop a quality system that is described and approved in quality management plans (QMP) and quality assurance project plans (QAPP) to ensure that the monitoring results:

(a) Meet a well-defined need, use, or purpose;

(b) Provide data of adequate quality for the intended monitoring objectives;

(c) Satisfy stakeholder expectations;

(d) Comply with applicable standards specifications;

(e) Comply with statutory (and other) requirements of society; and

(f) Reflect consideration of cost and economics.

2.1.1 The QMP describes the quality system in terms of the organizational structure, functional responsibilities of management and staff, lines of authority, and required interfaces for those planning, implementing, assessing and reporting activities involving environmental data operations (EDO). The QMP must be suitably documented in accordance with EPA requirements (reference 2 of this appendix), and approved by the appropriate Regional Administrator, or his or her representative. The quality system will be reviewed during the systems audits described in section 2.5 of this appendix. Organizations that implement long-term monitoring programs with EPA funds should have a separate QMP document. Smaller organizations or organizations that do infrequent work with EPA funds may combine the QMP with the QAPP based on negotiations with the funding agency. Additional guidance on this process can be found in reference 10 of this appendix. Approval of the recipient's QMP by the appropriate Regional Administrator or his or her representative, may allow delegation of the authority to review and approve the QAPP to the recipient, based on adequacy of quality assurance procedures described and documented in the QMP. The QAPP will be reviewed by EPA during systems audits or circumstances related to data quality.

2.1.2 The QAPP is a formal document describing, in sufficient detail, the quality system that must be implemented to ensure that the results of work performed will satisfy the stated objectives. The quality assurance policy of the EPA requires every environmental data operation (EDO) to have a written and approved QAPP prior to the start of the EDO. It is the responsibility of the monitoring organization to adhere to this policy. The QAPP must be suitably documented in accordance with EPA requirements (reference 3 of this appendix).

2.1.3 The monitoring organization's quality system must have adequate resources both in personnel and funding to plan, implement, assess and report on the achievement of the requirements of this appendix and its approved QAPP.

2.2 Independence of Quality Assurance. The monitoring organization must provide for a quality assurance management function- that aspect of the overall

management system of the organization that determines and implements the quality policy defined in a monitoring organization's QMP. Quality management includes strategic planning, allocation of resources and other systematic planning activities (e.g., planning, implementation, assessing and reporting) pertaining to the quality system. The quality assurance management function must have sufficient technical expertise and management authority to conduct independent oversight and assure the implementation of the organization's quality system relative to the ambient air quality monitoring program and should be organizationally independent of environmental data generation activities.

2.3. Data Quality Performance Requirements.

2.3.1 Data Quality Objectives. Data quality objectives (DQO) or the results of other systematic planning processes are statements that define the appropriate type of data to collect and specify the tolerable levels of potential decision errors that will be used as a basis for establishing the quality and quantity of data needed to support the objectives of the SLAMS stations. DQO will be developed by EPA to support the primary SLAMS objectives for each criteria pollutant. As they are developed they will be added to the regulation. DQO or the results of other systematic planning processes for PSD or other monitoring will be the responsibility of the monitoring organizations. The quality of the conclusions made from data interpretation can be affected by population uncertainty (spatial or temporal uncertainty) and measurement uncertainty (uncertainty associated with collecting, analyzing, reducing and reporting concentration data). This appendix focuses on assessing and controlling measurement uncertainty.

2.3.1.1 Measurement Uncertainty for Automated and Manual $PM_{2.5}$ Methods. The goal for acceptable measurement uncertainty is defined as 10 percent coefficient of variation (CV) for total precision and plus or minus 10 percent for total bias.

2.3.1.2 Measurement Uncertainty for Automated Ozone Methods. The goal for acceptable measurement uncertainty is defined for precision as an upper 90 percent confidence limit for the coefficient variation (CV) of 7 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 7 percent.

2.3.1.3 Measurement Uncertainty for $PM_{10–2.5}$ Methods. The goal for acceptable measurement uncertainty is defined for precision as an upper 90 percent confidence limit for the coefficient variation (CV) of 15 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 15 percent.

2.3.1.4 Measurement Uncertainty for Pb Methods. The goal for acceptable measurement uncertainty is defined for precision as an upper 90 percent confidence limit for the coefficient variation (CV) of 20 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 15 percent.

2.3.1.5 Measurement Uncertainty for NO_2. The goal for acceptable measurement uncertainty is defined for precision as an upper 90 percent confidence limit for the coefficient of variation (CV) of 15 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 15 percent.

2.3.1.6 Measurement Uncertainty for SO_2. The goal for acceptable measurement uncertainty for precision is defined as an upper 90 percent confidence limit for the coefficient of variation (CV) of 10 percent and for bias as an upper 95 percent confidence limit for the absolute bias of 10 percent.

2.4 National Performance Evaluation Programs. Monitoring plans or the QAPP shall provide for the implementation of a program of independent and adequate audits of all monitors providing data for SLAMS and PSD including the provision of adequate resources for such audit programs. A monitoring plan (or QAPP) which provides for monitoring organization participation in EPA's National Performance Audit Program (NPAP) and the PM Performance Evaluation Program (PEP) program and which indicates the consent of the monitoring organization for EPA to apply an appropriate portion of the grant funds, which EPA would otherwise award to the monitoring organization for monitoring activities, will be deemed by EPA to meet this requirement. For clarification and to participate, monitoring organizations should contact either the appropriate EPA Regional Quality Assurance (QA) Coordinator at the appropriate EPA Regional Office location, or the NPAP Coordinator at the Air Quality Assessment Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency in Research Triangle Park, North Carolina.

2.5 Technical Systems Audit Program. Technical systems audits of each ambient air monitoring organization shall be conducted at least every 3 years by the appropriate EPA Regional Office and reported to the AQS. Systems audit programs are described in reference 10 of this appendix. For further instructions, monitoring organizations should contact the appropriate EPA Regional QA Coordinator.

2.6 Gaseous and Flow Rate Audit Standards.

2.6.1 Gaseous pollutant concentration standards (permeation devices or cylinders of compressed gas) used to obtain test concentrations for carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxide (NO), and nitrogen dioxide (NO_2) must be traceable to either a National Institute of Standards and Technology (NIST) Traceable Reference Material (NTRM) or a NIST–certified Gas Manufacturer's Internal Standard (GMIS), certified in accordance with one of the procedures given in reference 4 of this appendix. Vendors advertising certification with the procedures provided in reference 4 of this appendix and distributing gasses as "EPA Protocol Gas" must participate in the EPA Protocol Gas Verification Program or not use "EPA" in any form of advertising.

2.6.2 Test concentrations for ozone (O_3) must be obtained in accordance with the ultra violet photometric calibration procedure specified in appendix D to part 50 of this chapter, or by means of a certified O_3 transfer standard. Consult references 7 and 8 of this appendix for guidance on primary and transfer standards for O_3 .

2.6.3 Flow rate measurements must be made by a flow measuring instrument that is traceable to an authoritative volume or other applicable standard. Guidance for certifying some types of flowmeters is provided in reference 10 of this appendix.

2.7 Primary Requirements and Guidance. Requirements and guidance documents for developing the quality system are contained in references 1 through 10 of this appendix, which also contain many suggested procedures, checks, and control specifications. Reference 10 of this appendix describes specific guidance for the development of a quality system for SLAMS. Many specific quality control checks and specifications for methods are included in the respective reference methods described in part 50 of this chapter or in the respective equivalent method descriptions available from EPA (reference 6 of this appendix). Similarly, quality control procedures related to specifically designated reference and equivalent method analyzers are contained in the respective operation or instruction manuals associated with those analyzers.

3. Measurement Quality Check Requirements

This section provides the requirements for primary quality assurance organizations (PQAOs) to perform the measurement quality checks that can be used to assess data quality. With the exception of the flow rate verifications (sections 3.2.3 and 3.3.2 of this appendix), data from these checks are required to be submitted to the AQS within the same time frame as routine ambient concentration data. Section 3.2 of this appendix describes checks of automated or continuous instruments while section 3.3 describe checks associated with manual sampling instruments.

Other quality control samples are identified in the various references described earlier and can be used to control certain aspects of the measurement system.

3.1 Primary Quality Assurance Organization. A primary quality assurance organization is defined as a monitoring organization or a coordinated aggregation of such organizations that is responsible for a set of stations that monitors the same pollutant and for which data quality assessments can logically be pooled. Each criteria pollutant sampler/monitor at a monitoring station in the SLAMS network must be associated with one, and only one, primary quality assurance organization.

3.1.1 Each primary quality assurance organization shall be defined such that measurement uncertainty among all stations in the organization can be expected to be reasonably homogeneous, as a result of common factors. Common factors that should be considered by monitoring organizations in defining primary quality assurance organizations include:

(a) Operation by a common team of field operators according to a common set of procedures;

(b) Use of a common QAPP or standard operating procedures;

(c) Common calibration facilities and standards;

(d) Oversight by a common quality assurance organization; and

(e) Support by a common management, laboratory or headquarters.

3.1.2 Primary quality assurance organizations are not necessarily related to the organization reporting data to the AQS. Monitoring organizations having difficulty in defining the primary quality assurance organizations or in assigning specific sites to primary quality assurance organizations should consult with the appropriate EPA Regional Office. All definitions of primary quality assurance organizations shall be subject to final approval by the appropriate EPA Regional Office during scheduled network reviews or systems audits.

3.1.3 Data quality assessment results shall be reported as specified in section 5 of this appendix.

3.2 Measurement Quality Checks of Automated Methods. Table A–2 of this appendix provides a summary of the types and frequency of the measurement quality checks that will be described in this section.

3.2.1 One–Point Quality Control Check for SO_2, NO_2, O_3, and CO. A one-point quality control (QC) check must be performed at least once every 2 weeks on each automated analyzer used to measure SO_2, NO_2, O_3 and CO. The frequency of QC checks may be reduced based upon review, assessment and approval of the EPA Regional Administrator. However, with the advent of automated calibration systems more frequent checking is encouraged. See Reference 10 of this appendix for guidance on the review procedure. The QC check is made by challenging the analyzer with a QC check gas of known concentration (effective concentration for open path analyzers) between 0.01 and 0.10 parts per million (ppm) for SO_2, NO_2, and O_3, and between 1 and 10 ppm for CO analyzers. The ranges allow for appropriate check gas selection for SLAMS sites that may be sampling for different objectives, i.e., trace gas monitoring vs. comparison to National Ambient Air Quality Standards (NAAQS). The QC check gas concentration selected should be related to the routine concentrations normally measured at sites within the monitoring network in order to appropriately reflect the precision and bias at these routine concentration ranges. To check the precision and bias of SLAMS analyzers operating at ranges either above or below the levels identified, use check gases of appropriate concentrations as approved by the appropriate EPA Regional Administrator or their designee. The standards from which check concentrations are obtained must meet the specifications of section 2.6 of this appendix.

3.2.1.1 Except for certain CO analyzers described below, point analyzers must operate in their normal sampling mode during the QC check, and the test atmosphere must pass through all filters, scrubbers, conditioners and other components used during normal ambient sampling and as much of the ambient air inlet system as is practicable. If permitted by the associated operation or instruction manual, a CO point analyzer may be temporarily modified during the QC check to reduce vent or purge flows, or the test atmosphere may enter the analyzer at a point other than the normal sample inlet, provided that the analyzer's response is not likely to be altered by these deviations from the normal operational mode. If a QC check is made in conjunction with a zero or span adjustment, it must be made prior to such zero or span adjustments.

3.2.1.2 Open path analyzers are tested by inserting a test cell containing a QC check gas concentration into the optical measurement beam of the instrument. If possible, the normally used transmitter, receiver, and as appropriate, reflecting devices should be used during the test and the normal monitoring configuration of the instrument should be altered as little as possible to accommodate the test cell for the test. However, if permitted by the associated operation or instruction manual, an alternate local light source or an alternate optical path that does not

include the normal atmospheric monitoring path may be used. The actual concentration of the QC check gas in the test cell must be selected to produce an effective concentration in the range specified earlier in this section. Generally, the QC test concentration measurement will be the sum of the atmospheric pollutant concentration and the QC test concentration. If so, the result must be corrected to remove the atmospheric concentration contribution. The corrected concentration is obtained by subtracting the average of the atmospheric concentrations measured by the open path instrument under test immediately before and immediately after the QC test from the QC check gas concentration measurement. If the difference between these before and after measurements is greater than 20 percent of the effective concentration of the test gas, discard the test result and repeat the test. If possible, open path analyzers should be tested during periods when the atmospheric pollutant concentrations are relatively low and steady.

3.2.1.3 Report the audit concentration (effective concentration for open path analyzers) of the QC gas and the corresponding measured concentration (corrected concentration, if applicable, for open path analyzers) indicated by the analyzer. The percent differences between these concentrations are used to assess the precision and bias of the monitoring data as described in sections 4.1.2 (precision) and 4.1.3 (bias) of this appendix.

3.2.2 Annual performance evaluation for SO_2, NO_2, O_3, or CO. Each calendar quarter (during which analyzers are operated), evaluate at least 25 percent of the SLAMS analyzers that monitor for SO_2, NO_2, O_3, or CO such that each analyzer is evaluated at least once per year. If there are fewer than four analyzers for a pollutant within a primary quality assurance organization, it is suggested to randomly evaluate one or more analyzers so that at least one analyzer for that pollutant is evaluated each calendar quarter. The evaluation should be conducted by a trained experienced technician other than the routine site operator.

3.2.2.1 (a) The evaluation is made by challenging the analyzer with audit gas standard of known concentration (effective concentration for open path analyzers) from at least three consecutive audit levels. The audit levels selected should represent or bracket 80 percent of ambient concentrations measured by the analyzer being evaluated:

Audit level	Concentration range, ppm			
	O_3	SO_2	NO_2	CO
1	0.02-0.05	0.0003-0.005	0.0002-0.002	0.08-0.10
2	0.06-0.10	0.006-0.01	0.003-0.005	0.50-1.00
3	0.11-0.20	0.02-0.10	0.006-0.10	1.50-4.00
4	0.21-0.30	0.11-0.40	0.11-0.30	5-15
5	0.31-0.90	0.41-0.90	0.31-0.60	20-50

(b) An additional 4th level is encouraged for those monitors that have the potential for exceeding the concentration ranges described by the initial three selected.

3.2.2.2 (a) NO_2 audit gas for chemiluminescence-type NO_2 analyzers must also contain at least 0.08 ppm NO. NO concentrations substantially higher than 0.08 ppm, as may occur when using some gas phase titration (GPT) techniques, may lead to evaluation errors in chemiluminescence analyzers due to inevitable minor NO–NO_X channel imbalance. Such errors may be atypical of routine monitoring errors to the extent that such NO concentrations exceed typical ambient NO concentrations at the site. These errors may be minimized by modifying the GPT technique to lower the NO concentrations remaining in the NO_2 audit gas to levels closer to typical ambient NO concentrations at the site.

(b) To evaluate SLAMS analyzers operating on ranges higher than 0 to 1.0 ppm for SO_2, NO_2, and O_3 or 0 to 50 ppm for CO, use audit gases of appropriately higher concentration as approved by the appropriate EPA Regional Administrator or the Administrator's designee.

3.2.2.3 The standards from which audit gas test concentrations are obtained must meet the specifications of section 2.6 of this appendix. The gas standards and equipment used for evaluations must not be the same as the standards and equipment used for calibration or calibration span adjustments. For SLAMS sites, the auditor should not be the operator or analyst who conducts the routine monitoring, calibration, and analysis. For PSD sites the auditor must not be the operator or analyst who conducts the routine monitoring, calibration, and analysis.

3.2.2.4 For point analyzers, the evaluation shall be carried out by allowing the analyzer to analyze the audit gas test atmosphere in its normal sampling mode such that the test atmosphere passes through all filters, scrubbers, conditioners, and other sample inlet components used during normal ambient sampling and as much of the ambient air inlet system as is practicable. The exception provided in section 3.2.1 of this appendix for certain CO analyzers does not apply for evaluations.

3.2.2.5 Open path analyzers are evaluated by inserting a test cell containing the various audit gas concentrations into the optical measurement beam of the instrument. If possible, the normally used transmitter, receiver, and, as appropriate, reflecting devices should be used during the evaluation, and the normal monitoring configuration of the instrument should be modified as little as possible to accommodate the test cell for the evaluation. However, if permitted by the associated operation or instruction manual, an alternate local light source or an alternate optical path that does not include the normal atmospheric monitoring path may be used. The actual concentrations of the audit gas in the test cell must be selected to produce effective concentrations in the evaluation level ranges specified in this section of this appendix. Generally, each evaluation concentration measurement result will be the sum of the atmospheric pollutant concentration and the evaluation test concentration. If so, the result must be corrected to remove the atmospheric concentration contribution. The corrected concentration is obtained by subtracting the average of the atmospheric concentrations measured by the open path instrument under test immediately before and immediately after the evaluation test (or preferably before and after each evaluation concentration level) from the evaluation concentration measurement. If the difference between the before and after measurements is greater than 20 percent of the effective concentration of the test gas standard, discard the test result for that concentration level and repeat the test for that level. If possible, open path analyzers should be evaluated during periods when the atmospheric pollutant concentrations are relatively low and steady. Also, if the open path instrument is not installed in a permanent manner, the monitoring path length must be reverified to within plus or minus 3 percent to validate the evaluation, since the monitoring path length is critical to the determination of the effective concentration.

3.2.2.6 Report both the evaluation concentrations (effective concentrations for open path analyzers) of the audit gases and the corresponding measured concentration (corrected concentrations, if applicable, for open path analyzers) indicated or produced by the analyzer being tested. The percent differences between these concentrations are used to assess the quality of the monitoring data as described in section 4.1.4 of this appendix.

3.2.3 Flow Rate Verification for Particulate Matter. A one-point flow rate verification check must be performed at least once every month on each automated analyzer used to measure PM_{10}, $PM_{10-2.5}$ and $PM_{2.5}$. The verification is made by checking the operational flow rate of the analyzer. If the verification is made in conjunction with a flow rate adjustment, it must be made prior to such flow rate adjustment. Randomization of the flow rate verification with respect to time of day, day of week, and routine service and adjustments is encouraged where possible. For the standard procedure, use a flow rate transfer standard certified in accordance with section 2.6 of this appendix to check the analyzer's normal flow rate. Care should be used in selecting and using the flow rate measurement device such that it does not alter the normal operating flow rate of the analyzer. Report the flow rate of the transfer standard and the corresponding flow rate measured (indicated) by the analyzer. The percent differences between the audit and measured flow rates are used to assess the bias of the monitoring data as described in section 4.2.2 of this appendix (using flow rates in lieu of concentrations).

3.2.4 Semi–Annual Flow Rate Audit for Particulate Matter. Every 6 months, audit the flow rate of the PM_{10}, $PM_{10-2.5}$ and $PM_{2.5}$ particulate analyzers. Where possible, EPA strongly encourages more frequent auditing. The audit should (preferably) be conducted by a trained experienced technician other than the routine site operator. The audit is made by measuring the analyzer's normal operating flow rate using a flow rate transfer standard certified in accordance with section 2.6 of this appendix. The flow rate standard used for auditing must not be the same flow rate standard used to calibrate the analyzer. However, both the calibration standard and the audit standard may be referenced to the same primary flow rate or volume standard. Great care must be used in auditing the flow rate to be certain that the flow measurement device does not alter the normal operating flow rate of the analyzer. Report the audit flow rate of the transfer standard and the corresponding flow rate measured (indicated) by the analyzer. The percent differences between these flow rates are used to validate the one-point flow rate verification checks used to estimate bias as described in section 4.2.3 of this appendix.

3.2.5 Collocated Sampling Procedures for $PM_{2.5}$. For each pair of collocated monitors, designate one sampler as the primary monitor whose concentrations will be used to report air quality for the site, and designate the other as the audit monitor.

3.2.5.1 Each EPA designated Federal reference method (FRM) or Federal equivalent method (FEM) within a primary quality assurance organization must:

(a) Have 15 percent of the monitors collocated (values of 0.5 and greater round up); and

(b) Have at least 1 collocated monitor (if the total number of monitors is less than 3). The first collocated monitor must be a designated FRM monitor.

3.2.5.2 In addition, monitors selected for collocation must also meet the following requirements:

(a) A primary monitor designated as an EPA FRM shall be collocated with an audit monitor having the same EPA FRM method designation.

(b) For each primary monitor model designated as an EPA FEM used by the PQAO, 50 percent of the monitors designated for collocation shall be collocated with an audit monitor having the same method designation and 50 percent of the monitors shall be collocated with an FRM audit monitor. If the primary quality assurance organization only has one FEM monitor it shall be collocated with an FRM audit monitor. If there are an odd number of collocated monitors required, the additional monitor shall be an FRM audit monitor. An example of this procedure is found in Table A–3 of this appendix.

3.2.5.3 The collocated monitors should be deployed according to the following protocol:

(a) 80 percent of the collocated audit monitors should be deployed at sites with annual average or daily concentrations estimated to be within ±20 percent of the applicable NAAQS and the remainder at what the monitoring organizations designate as high value sites;

(b) If an organization has no sites with annual average or daily concentrations within ± 20 percent of the annual NAAQS (or 24–hour NAAQS if that is affecting the area), 60 percent of the collocated audit monitors should be deployed at those sites with the annual mean concentrations (or 24–hour NAAQS if that is affecting the area) among the highest 25 percent for all sites in the network.

3.2.5.4 In determining the number of collocated sites required for $PM_{2.5}$, monitoring networks for visibility assessments should not be treated independently from networks for particulate matter, as the separate networks may share one or more common samplers. However, for Class I visibility areas, EPA will accept visibility aerosol mass measurement instead of a $PM_{2.5}$ measurement if the latter measurement is unavailable. Any $PM_{2.5}$ monitoring site which does not have a

monitor which is an EPA FRM, FEM or ARM is not required to be included in the number of sites which are used to determine the number of collocated monitors.

3.2.5.5 For each PSD monitoring network, one site must be collocated. A site with the predicted highest 24–hour pollutant concentration must be selected.

3.2.5.6 The two collocated monitors must be within 4 meters of each other and at least 2 meters apart for flow rates greater than 200 liters/min or at least 1 meter apart for samplers having flow rates less than 200 liters/min to preclude airflow interference. A waiver allowing up to 10 meters horizontal distance and up to 3 meters vertical distance (inlet to inlet) between a primary and collocated sampler may be approved by the Regional Administrator for sites at a neighborhood or larger scale of representation. This waiver may be approved during the annual network plan approval process. Calibration, sampling, and analysis must be the same for all the collocated samplers in each agency's network.

3.2.5.7 Sample the collocated audit monitor for SLAMS sites on a 12–day schedule; sample PSD sites on a 6–day schedule or every third day for PSD daily monitors. If a primary quality assurance organization has only one collocated monitor, higher sampling frequencies than the 12–day schedule may be needed in order to produce about 25 valid sample pairs a year. Report the measurements from both primary and collocated audit monitors at each collocated sampling site. The calculations for evaluating precision between the two collocated monitors are described in section 4.3.1 of this appendix.

3.2.6 Collocated Sampling Procedures for $PM_{10–2.5}$. For the $PM_{10–2.5}$ network, all automated methods must be designated as Federal equivalent methods (FEMs). For each pair of collocated monitors, designate one sampler as the primary monitor whose concentrations will be used to report air quality for the site, and designate the other as the audit monitor.

3.2.6.1 The EPA shall ensure that each EPA designated FEM within the national $PM_{10–2.5}$ monitoring network must:

(a) Have 15 percent of the monitors collocated (values of 0.5 and greater round up); and

(b) Have at least 2 collocated monitors (if the total number of monitors is less than 10). The first collocated monitor must be a designated FRM monitor and the second must be a monitor of the same method designation. Both collocated FRM and FEM monitors can be located at the same site.

3.2.6.2 The Regional Administrator for the EPA Regions where the FEMs are implemented will select the sites for collocated monitoring. The site selection process shall consider giving priority to sites at primary quality assurance organizations or States with more than one $PM_{10-2.5}$ site, sites considered important from a regional perspective, and sites needed for an appropriate distribution among rural and urban NCore sites. Depending on the speed at which the $PM_{10-2.5}$ network is deployed, the first sites implementing FEMs shall be required to perform collocation until there is a larger distribution of FEM monitors implemented in the network.

3.2.6.3 The two collocated monitors must be within 4 meters of each other and at least 2 meters apart for flow rates greater than 200 liters/min or at least 1 meter apart for samplers having flow rates less than 200 liters/min to preclude airflow interference. A waiver allowing up to 10 meters horizontal distance and up to 3 meters vertical distance (inlet to inlet) between a primary and a collocated sampler may be approved by the Regional Administrator for sites at a neighborhood or larger scale of representation taking into consideration safety, logistics, and space availability. This waiver may be approved during the annual network plan approval process. Calibration, sampling, and analysis must be the same for all the collocated samplers in each agency's network.

3.2.6.4 Sample the collocated audit monitor for SLAMS sites on a 12–day schedule. Report the measurements from both primary and collocated audit monitors at each collocated sampling site. The calculations for evaluating precision between the two collocated monitors are described in section 4.3.1 of this appendix.

3.2.7 $PM_{2.5}$ Performance Evaluation Program (PEP) Procedures. The PEP is an independent assessment used to estimate total measurement system bias. These evaluations will be performed under the PM Performance Evaluation Program (PEP) (section 2.4 of this appendix) or a comparable program. Performance evaluations will be performed on the SLAMS monitors annually within each primary quality assurance organization. For primary quality assurance organizations with less than or equal to five monitoring sites, five valid performance evaluation audits must be collected and reported each year. For primary quality assurance organizations with greater than five monitoring sites, eight valid performance evaluation audits must be collected and reported each year. A valid performance evaluation audit means that both the primary monitor and PEP audit concentrations are valid and above 3 $\mu g/m^3$. Additionally, each year, every designated FRM or FEM within a primary quality assurance organization must:

(1) Have each method designation evaluated each year; and,

(2) Have all FRM or FEM samplers subject to a PEP audit at least once every six years; which equates to approximately 15 percent of the monitoring sites audited each year.

(b) Additional information concerning the Performance Evaluation Program is contained in reference 10 of this appendix. The calculations for evaluating bias between the primary monitor and the performance evaluation monitor for $PM_{2.5}$ are described in section 4.3.2 of this appendix.

3.2.8 $PM_{10-2.5}$ Performance Evaluation Program. For the $PM_{10-2.5}$ network, all automated methods will be designated as federal equivalent methods (FEMs). One performance evaluation audit, as described in section 3.2.7 must be performed at one $PM_{10-2.5}$ site in each primary quality assurance organization each year. The calculations for evaluating bias between the primary monitor(s) and the performance evaluation monitors for $PM_{10-2.5}$ are described in section 4.1.3 of this appendix.

3.3 Measurement Quality Checks of Manual Methods. Table A–2 of this appendix provides a summary of the types and frequency of the measurement quality checks that will be described in this section.

3.3.1 Collocated Sampling Procedures for PM_{10}. For each network of manual PM_{10} methods, select 15 percent (or at least one) of the monitoring sites within the primary quality assurance organization for collocated sampling. For purposes of precision assessment, networks for measuring total suspended particulate (TSP) and PM_{10} shall be considered separately from one another. However, PM_{10} samplers used in the $PM_{10-2.5}$ network, may be counted along with the PM_{10} samplers in the PM_{10} network as long as the PM_{10} samplers in both networks are the same method designation. PM_{10} and TSP sites having annual mean particulate matter concentrations among the highest 25 percent of the annual mean concentrations for all the sites in the network must be selected or, if such sites are impractical, alternative sites approved by the EPA Regional Administrator may be selected.

3.3.1.1 In determining the number of collocated sites required for PM_{10}, monitoring networks for lead (Pb) should be treated independently from networks for particulate matter (PM), even though the separate networks may share one or more common samplers. However, a single pair of samplers collocated at a

common-sampler monitoring site that meets the requirements for both a collocated Pb site and a collocated PM site may serve as a collocated site for both networks.

3.3.1.2 The two collocated monitors must be within 4 meters of each other and at least 2 meters apart for flow rates greater than 200 liters/min or at least 1 meter apart for samplers having flow rates less than 200 liters/min to preclude airflow interference. Calibration, sampling, analysis and verification/validation procedures must be the same for both collocated samplers and the same as for all other samplers in the network.

3.3.1.3 For each pair of collocated samplers, designate one sampler as the primary sampler whose samples will be used to report air quality for the site, and designate the other as the audit sampler. Sample SLAMS sites on a 12–day schedule; sample PSD sites on a 6–day schedule or every third day for PSD daily samplers. If a primary quality assurance organization has only one collocated monitor, higher sampling frequencies than the 12–day schedule may be needed in order to produce approximately 25 valid sample pairs a year. Report the measurements from both samplers at each collocated sampling site. The calculations for evaluating precision between the two collocated samplers are described in section 4.2.1 of this appendix.

3.3.2 Flow Rate Verification for Particulate Matter. Follow the same procedure as described in section 3.2.3 of this appendix for $PM_{2.5}$, PM_{10} (low-volume instruments), and $PM_{10–2.5}$. High-volume PM_{10} and TSP instruments can also follow the procedure in section 3.2.3 but the audits are required to be conducted quarterly. The percent differences between the audit and measured flow rates are used to assess the bias of the monitoring data as described in section 4.2.2 of this appendix.

3.3.3 Semi–Annual Flow Rate Audit for Particulate Matter. Follow the same procedure as described in section 3.2.4 of this appendix for $PM_{2.5}$, PM_{10}, $PM_{10–2.5}$ and TSP instruments. The percent differences between these flow rates are used to validate the one-point flow rate verification checks used to estimate bias as described in section 4.2.3 of this appendix. Great care must be used in auditing high-volume particulate matter samplers having flow regulators because the introduction of resistance plates in the audit flow standard device can cause abnormal flow patterns at the point of flow sensing. For this reason, the flow audit standard should be used with a normal filter in place and without resistance plates in auditing flow-regulated high-volume samplers, or other steps should be taken to assure that flow patterns are not perturbed at the point of flow sensing.

3.3.4 Pb Methods.

3.3.4.1 Flow Rates. For the Pb Reference Methods (40 CFR Part 50, appendix G and appendix Q) and associated FEMs, the flow rates of the Pb samplers shall be verified and audited using the same procedures described in sections 3.3.2 and 3.3.3 of this appendix.

3.3.4.2 Pb Analysis Audits. Each calendar quarter or sampling quarter (PSD), audit the Pb Reference Method analytical procedure using filters containing a known quantity of Pb. These audit filters are prepared by depositing a Pb solution on unexposed filters and allowing them to dry thoroughly. The audit samples must be prepared using batches of reagents different from those used to calibrate the Pb analytical equipment being audited. Prepare audit samples in the following concentration ranges:

Range Equivalent ambient Pb concentration, µg/m^3

1 30-100% of Pb NAAQS.

2 200-300% of Pb NAAQS.

(a) Audit samples must be extracted using the same extraction procedure used for exposed filters.

(b) Analyze three audit samples in each of the two ranges each quarter samples are analyzed. The audit sample analyses shall be distributed as much as possible over the entire calendar quarter.

(c) Report the audit concentrations (in µg Pb/filter or strip) and the corresponding measured concentrations (in µg Pb/filter or strip) using AQS unit code 077. The percent differences between the concentrations are used to calculate analytical accuracy as described in section 4.1.3 of this appendix.

(d) The audits of an equivalent Pb method are conducted and assessed in the same manner as for the reference method. The flow auditing device and Pb analysis audit samples must be compatible with the specific requirements of the equivalent method.

3.3.4.3 Collocated Sampling. PQAO that have a combination of source and non-source-oriented sites (unless the only non-source-oriented site is an NCore site) will follow the procedures described in sections 3.3.1 of this appendix with the exception that the first collocated Pb site selected must be the site measuring the

highest Pb concentrations in the network. If the site is impractical, alternative sites, approved by the EPA Regional Administrator, may be selected. If additional collocated sites are necessary, collocated sites may be chosen that reflect average ambient air Pb concentrations in the network. The collocated sampling requirements for PQAO that only have Pb monitoring at a non-source-oriented NCore site for sampling required under 40 CFR 58, Appendix D, paragraph 4.5(b) shall be implemented as described in section 3.2.6 of this appendix with the exception that the collocated monitor will be the same method designation as the primary monitor.

3.3.4.4 Pb Performance Evaluation Program (PEP) Procedures. Each year, one performance evaluation audit, as described in section 3.2.7 of this appendix, must be performed at one Pb site in each primary quality assurance organization that has less than or equal to 5 sites and two audits at primary quality assurance organizations with greater than 5 sites. In addition, each year, four collocated samples from primary quality assurance organizations with less than or equal to 5 sites and six collocated samples at primary quality assurance organizations with greater than 5 sites must be sent to an independent laboratory, the same laboratory as the performance evaluation audit, for analysis.

3.3.5 Collocated Sampling Procedures for $PM_{2.5}$. Follow the same procedure as described in section 3.2.5 of this appendix. $PM_{2.5}$ samplers used in the $PM_{10–2.5}$ network, may be counted along with the $PM_{2.5}$ samplers in the $PM_{2.5}$ network as long as the $PM_{2.5}$ samplers in both networks are the same method designation.

3.3.6 Collocated Sampling Procedures for $PM_{10–2.5}$. All designated FRMs within the $PM_{10–2.5}$ monitoring network must have 15 percent of the monitors collocated (values of 0.5 and greater round up) at the $PM_{10–2.5}$ sites. All FRM method designations can be aggregated.

3.3.6.1 The EPA shall ensure that each designated FEM within the $PM_{10–2.5}$ monitoring network must:

(a) Have 15 percent of the monitors collocated (values of 0.5 and greater round up); and

(b) Have at least 2 collocated monitors (if the total number of monitors is less than 10). The first collocated monitor must be a designated FRM monitor and the second must be a monitor of the same method designation. Both collocated FRM and FEM monitors can be located at the same site.

3.3.6.2 The Regional Administrator for the EPA Region where the FRM or FEMs are implemented will select the sites for collocated monitoring. The collocation site selection process shall consider sites at primary quality assurance organizations or States with more than one $PM_{10-2.5}$ site; primary quality assurance organizations already monitoring for PM_{10} and $PM_{2.5}$ using FRMs or FEMs; and an appropriate distribution among rural and urban NCore sites. Monitoring organizations implementing PM_{10} samplers and $PM_{2.5}$ FRM samplers of the same method designation as the $PM_{10-2.5}$ FRM can include the $PM_{10-2.5}$ monitors in their respective PM_{10} and $PM_{2.5}$ count. Follow the same procedures as described in sections 3.2.6.2 and 3.2.6.3 of this appendix.

3.3.7 $PM_{2.5}$ Performance Evaluation Program (PEP) Procedures. Follow the same procedure as described in section 3.2.7 of this appendix.

3.3.8 $PM_{10-2.5}$ Performance Evaluation Program (PEP) Procedures. One performance evaluation audit, as described in section 3.2.7 of this appendix must be performed at one $PM_{10-2.5}$ site in each primary quality assurance organization each year. Monitoring organizations implementing $PM_{2.5}$ FRM samplers of the same method designation in both the $PM_{2.5}$ and the $PM_{10-2.5}$ networks can include the $PM_{10-2.5}$ performance evaluation audit in their respective $PM_{2.5}$ performance evaluation count as long as the performance evaluation is conducted at the $PM_{10-2.5}$ site. The calculations for evaluating bias between the primary monitor(s) and the performance evaluation monitors for $PM_{10-2.5}$ are described in section 4.1.3 of this appendix.

4. Calculations for Data Quality Assessment

(a) Calculations of measurement uncertainty are carried out by EPA according to the following procedures. Primary quality assurance organizations should report the data for all appropriate measurement quality checks as specified in this appendix even though they may elect to perform some or all of the calculations in this section on their own.

(b) The EPA will provide annual assessments of data quality aggregated by site and primary quality assurance organization for SO_2, NO_2, O_3 and CO and by primary quality assurance organization for PM_{10}, $PM_{2.5}$, $PM_{10-2.5}$ and Pb.

(c) At low concentrations, agreement between the measurements of collocated samplers, expressed as relative percent difference or percent difference, may be relatively poor. For this reason, collocated measurement pairs are selected for use

in the precision and bias calculations only when both measurements are equal to or above the following limits:

(1) TSP: 20 $\mu g/m^3$.

(2) Pb: 0.02 $\mu g/m^3$.

(3) PM_{10} (Hi–Vol): 15 $\mu g/m^3$.

(4) PM_{10} (Lo–Vol): 3 $\mu g/m^3$.

(5) $PM_{10-2.5}$ and $PM_{2.5}$: 3 $\mu g/m^3$.

4.1 Statistics for the Assessment of QC Checks for SO_2, NO_2, O_3 and CO.

4.1.1 Percent Difference. All measurement quality checks start with a comparison of an audit concentration or value (flowrate) to the concentration/value measured by the analyzer and use percent difference as the comparison statistic as described in equation 1 of this section. For each single point check, calculate the percent difference, d_i, as follows:

Equation 1

$$d_i = \frac{meas - audit}{audit} \times 100$$

where, meas is the concentration indicated by the monitoring organization's instrument and audit is the audit concentration of the standard used in the QC check being measured.

4.1.2 Precision Estimate. The precision estimate is used to assess the one-point QC checks for SO_2, NO_2, O_3, or CO described in section 3.2.1 of this appendix. The precision estimator is the coefficient of variation upper bound and is calculated using equation 2 of this section:

Equation 2

$$CV = \sqrt{\frac{n \cdot \sum_{i=1}^{n} d_i^2 - \left(\sum_{i=1}^{n} d_i\right)^2}{n(n-1)}} \cdot \sqrt{\frac{n-1}{X^2_{0.1,n-1}}}$$

where, $X^2_{0.1,n-1}$ is the 10th percentile of a chi-squared distribution with n–1 degrees of freedom.

4.1.3 Bias Estimate. The bias estimate is calculated using the one-point QC checks for SO_2, NO_2, O_3, or CO described in section 3.2.1 of this appendix and the performance evaluation program for $PM_{10-2.5}$ described in sections 3.2.8 and 3.3.8 of this appendix. The bias estimator is an upper bound on the mean absolute value of the percent differences as described in equation 3 of this section:

Equation 3

$$|AB| = AB + t_{0.95,n-1} \cdot \frac{AS}{\sqrt{n}}$$

where, n is the number of single point checks being aggregated; $t_{0.95,n-1}$ is the 95th quantile of a t-distribution with n–1 degrees of freedom; the quantity AB is the mean of the absolute values of the d_i's and is calculated using equation 4 of this section:

Equation 4

$$AB = \frac{1}{n} \cdot \sum_{i=1}^{n} |d_i|$$

and the quantity AS is the standard deviation of the absolute value of the d_i's and is calculated using equation 5 of this section:

Equation 5

$$AS = \sqrt{\frac{n \cdot \sum_{i=1}^{n} |d_i|^2 - \left(\sum_{i=1}^{n} |d_i|\right)^2}{n(n-1)}}$$

4.1.3.1 Assigning a sign (positive/negative) to the bias estimate. Since the bias statistic as calculated in equation 3 of this appendix uses absolute values, it does not have a tendency (negative or positive bias) associated with it. A sign will be designated by rank ordering the percent differences of the QC check samples from a given site for a particular assessment interval.

4.1.3.2 Calculate the 25th and 75th percentiles of the percent differences for each site. The absolute bias upper bound should be flagged as positive if both percentiles are positive and negative if both percentiles are negative. The absolute bias upper bound would not be flagged if the 25th and 75th percentiles are of different signs.

4.1.4 Validation of Bias Using the one-point QC Checks. The annual performance evaluations for SO_2, NO_2, O_3, or CO described in section 3.2.2 of this appendix are used to verify the results obtained from the one-point QC checks and to validate those results across a range of concentration levels. To quantify this annually at the site level and at the 3–year primary quality assurance organization level, probability limits will be calculated from the one-point QC checks using equations 6 and 7 of this appendix:

Equation 6

$$\text{Upper Probability Limit} = m + 1.96 \cdot S$$

Equation 7

$$\text{Lower Probability Limit} = m - 1.96 \cdot S$$

where, m is the mean (equation 8 of this appendix):

Equation 8

$$m = \frac{1}{k} \cdot \sum_{i=1}^{k} d_i$$

where, k is the total number of one point QC checks for the interval being evaluated and S is the standard deviation of the percent differences (equation 9 of this appendix) as follows:

Equation 9

$$S = \sqrt{\frac{k \cdot \sum_{i=1}^{k} d_i^2 - \left(\sum_{i=1}^{k} d_i\right)^2}{k(k-1)}}$$

4.1.5 Percent Difference. Percent differences for the performance evaluations, calculated using equation 1 of this appendix can be compared to the probability intervals for the respective site or at the primary quality assurance organization level. Ninety-five percent of the individual percent differences (all audit concentration levels) for the performance evaluations should be captured within the probability intervals for the primary quality assurance organization.

4.2 Statistics for the Assessment of PM_{10} .

4.2.1 Precision Estimate from Collocated Samplers. Precision is estimated via duplicate measurements from collocated samplers of the same type. It is recommended that the precision be aggregated at the primary quality assurance organization level quarterly, annually, and at the 3–year level. The data pair would only be considered valid if both concentrations are greater than the minimum values specified in section 4(c) of this appendix. For each collocated data pair, calculate the relative percent difference, di, using equation 10 of this appendix:

Equation 10

$$d_i = \frac{X_i - Y_i}{(X_i + Y_i)/2} \cdot 100$$

where, X_i is the concentration from the primary sampler and Y_i is the concentration value from the audit sampler. The coefficient of variation upper bound is calculated using the equation 11 of this appendix:

Equation 11

$$CV = \sqrt{\frac{n \cdot \sum_{i=1}^{n} d_i^2 - \left(\sum_{i=1}^{n} d_i\right)^2}{2n(n-1)}} \cdot \sqrt{\frac{n-1}{X^2_{0.1,n-1}}}$$

where, n is the number of valid data pairs being aggregated, and $X^2_{0.1, n-1}$ is the 10th percentile of a chi-squared distribution with n–1 ° of freedom. The factor of 2 in the denominator adjusts for the fact that each d_i is calculated from two values with error.

4.2.2 Bias Estimate Using One–Point Flow Rate Verifications. For each one-point flow rate verification described in sections 3.2.3 and 3.3.2 of this appendix, calculate the percent difference in volume using equation 1 of this appendix where meas is the value indicated by the sampler's volume measurement and audit is the actual volume indicated by the auditing flow meter. The absolute volume bias upper bound is then calculated using equation 3 of this appendix, where n is the number of flow rate audits being aggregated; $t_{0.95}$, n–1 is the 95th quantile of a t-distribution with n–1 ° of freedom, the quantity AB is the mean of the absolute values of the d_i 's and is calculated using equation 4 of this appendix, and the quantity AS in equation 3 of this appendix is the standard deviation of the absolute values of the d_i 's and is calculated using equation 5 of this appendix.

4.2.3 Assessment Semi–Annual Flow Rate Audits. The flow rate audits described in sections 3.2.4 and 3.3.3 of this appendix are used to assess the results obtained from the one-point flow rate verifications and to provide an estimate of flow rate acceptability. For each flow rate audit, calculate the percent difference in volume using equation 1 of this appendix where meas is the value indicated by the sampler's volume measurement and audit is the actual volume indicated by the auditing flow meter. To quantify this annually and at the 3–year primary quality assurance organization level, probability limits are calculated from the percent differences using equations 6 and 7 of this appendix where m is the mean described in equation 8 of this appendix and k is the total number of one-point flow rate verifications for the year and S is the standard deviation of the percent differences as described in equation 9 of this appendix.

4.2.4 Percent Difference. Percent differences for the annual flow rate audit concentration, calculated using equation 1 of this appendix, can be compared to the probability intervals for the one-point flow rate verifications for the respective primary quality assurance organization. Ninety-five percent of the individual percent differences (all audit concentration levels) for the performance evaluations should be captured within the probability intervals for primary quality assurance organization.

4.3 Statistics for the Assessment of $PM_{2.5}$ and $PM_{10–2.5}$.

4.3.1 Precision Estimate. Precision for collocated instruments for $PM_{2.5}$ and $PM_{10–2.5}$ may be estimated where both the primary and collocated instruments are the same method designation and when the method designations are not similar. Follow the procedure described in section 4.2.1 of this appendix. In addition, one may want to perform an estimate of bias when the primary monitor is an FEM and

the collocated monitor is an FRM. Follow the procedure described in section 4.1.3 of this appendix in order to provide an estimate of bias using the collocated data.

4.3.2 Bias Estimate. Follow the procedure described in section 4.1.3 of this appendix for the bias estimate of $PM_{10-2.5}$. The $PM_{2.5}$ bias estimate is calculated using the paired routine and the PEP monitor data described in section 3.2.6 of this appendix. Calculate the percent difference, d_i, using equation 1 of this appendix, where meas is the measured concentration from agency's primary monitor and audit is the concentration from the PEP monitor. The data pair would only be considered valid if both concentrations are greater than the minimum values specified in section 4(c) of this appendix. Estimates of bias are presented for various levels of aggregation, sometimes aggregating over time, sometimes aggregating over samplers, and sometimes aggregating over both time and samplers. These various levels of aggregation are achieved using the same basic statistic.

4.3.2.1 This statistic averages the individual biases described in equation 1 of this appendix to the desired level of aggregation using equation 12 of this appendix:

Equation 12

$$D = \frac{1}{n_j} \cdot \sum_{i=1}^{n_j} d_i$$

where, n_j is the number of pairs and d_1, d_2, * * *, d_{nj} are the biases for each of the pairs to be averaged.

4.3.2.2 Confidence intervals can be constructed for these average bias estimates in equation 12 of this appendix using equations 13 and 14 of this appendix:

Equation 13

$$\text{Upper 90\% Confidence Interval} = D + t_{0.95,df} \cdot \frac{s}{\sqrt{n_j}}$$

Equation 14

$$\text{Lower 90\% Confidence Interval} = D - t_{0.95,df} \cdot \frac{s}{\sqrt{n_j}}$$

Where, $t_{0.95,df}$ is the 95th quantile of a t-distribution with degrees of freedom df = n_j - 1 and s is an estimate of the variability of the average bias calculated using equation 15 of this appendix:

Equation 15

$$s = \sqrt{\frac{\sum_{i=1}^{n_j} (d_i - D)^2}{n_j - 1}}$$

4.4 Statistics for the Assessment of Pb.

4.4.1 Precision Estimate. Follow the same procedures as described for PM_{10} in section 4.2.1 of this appendix using the data from the collocated instruments. The data pair would only be considered valid if both concentrations are greater than the minimum values specified in section 4(c) of this appendix.

4.4.2 Bias Estimate. For the Pb analysis audits described in section 3.3.4.2 and the Pb Performance Evaluation Program described in section 3.3.4.4, follow the same procedure as described in section 4.1.3 for the bias estimate.

4.4.3 Flow rate calculations. For the one point flow rate verifications, follow the same procedures as described for PM_{10} in section 4.2.2; for the flow rate audits, follow the same procedures as described in section 4.2.3.

4.5 [Reserved by 73 FR 67060]

5. Reporting Requirements

5.1 SLAMS Reporting Requirements. For each pollutant, prepare a list of all monitoring sites and their AQS site identification codes in each primary quality assurance organization and submit the list to the appropriate EPA Regional Office, with a copy to AQS. Whenever there is a change in this list of monitoring sites in a

primary quality assurance organization, report this change to the EPA Regional Office and to AQS.

5.1.1 Quarterly Reports. For each quarter, each primary quality assurance organization shall report to AQS directly (or via the appropriate EPA Regional Office for organizations not direct users of AQS) the results of all valid measurement quality checks it has carried out during the quarter. The quarterly reports must be submitted consistent with the data reporting requirements specified for air quality data as set forth in § 58.16. The EPA strongly encourages early submission of the quality assurance data in order to assist the monitoring organizations control and evaluate the quality of the ambient air data.

5.1.2 Annual Reports.

5.1.2.1 When the monitoring organization has certified relevant data for the calendar year, EPA will calculate and report the measurement uncertainty for the entire calendar year.

5.2 PSD Reporting Requirements. At the end of each sampling quarter, the organization must report the appropriate statistical assessments in section 4 of this appendix for the pollutants measured. All data used to calculate reported estimates of precision and bias including span checks, collocated sampler and audit results must be made available to the permit granting authority upon request.

6.0 References

(1) American National Standard--Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs. ANSI/ASQC E4–2004. February 2004. Available from American Society for Quality Control, 611 East Wisconsin Avenue, Milwaukee, WI 53202.

(2) EPA Requirements for Quality Management Plans. EPA QA/R–2. EPA/240/B–01/002. March 2001. Office of Environmental Information, Washington DC 20460. http://www.epa.gov/quality/qs-docs/r2–final.pdf.

(3) EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations. EPA QA/R–5. EPA/240/B–01/003. March 2001. Office of Environmental Information, Washington DC 20460. http://www.epa.gov/quality/qs-docs/r5–final.pdf.

(4) EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards. EPA–600/R–97/121. September 1997. Available from U.S.

Environmental Protection Agency, ORD Publications Office, Center for Environmental Research Information (CERI), 26 W. Martin Luther King Drive, Cincinnati, OH 45268.

(5) Guidance for the Data Quality Objectives Process. EPA QA/G–4. EPA/240/B–06/001. February, 2006. Office of Environmental Information, Washington DC 20460. http://www.epa.gov/quality/qs-docs/g4–final.pdf.

(6) List of Designated Reference and Equivalent Methods. Available from U.S. Environmental Protection Agency, National Exposure Research Laboratory, Human Exposure and Atmospheric Sciences Division, MD–D205–03, Research Triangle Park, NC 27711. http://www.epa.gov/ttn/amtic/criteria.html.

(7) McElroy, F.F. Transfer Standards for the Calibration of Ambient Air Monitoring Analyzers for Ozone. EPA–600/4–79–056. U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, September, 1979. http://www.epa.gov/ttn/amtic/cpreldoc.html.

(8) Paur, R.J. and F.F. McElroy. Technical Assistance Document for the Calibration of Ambient Ozone Monitors. EPA–600/4–79–057. U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, September, 1979. http://www.epa.gov/ttn/amtic/cpreldoc.html.

(9) Quality Assurance Handbook for Air Pollution Measurement Systems, Volume 1--A Field Guide to Environmental Quality Assurance. EPA–600/R–94/038a. April 1994. Available from U.S. Environmental Protection Agency, ORD Publications Office, Center for Environmental Research Information (CERI), 26 W. Martin Luther King Drive, Cincinnati, OH 45268. http://www.epa.gov/ttn/amtic/qabook.html.

(10) Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II: Part 1--Ambient Air Quality Monitoring Program Quality System Development. EPA–454/R–98–004. http://www.epa.gov/ttn/amtic/qabook.html.

Table A-1 of Appendix A to Part 58--Difference and Similarities Between SLAMS and PSD Requirements

Topic	SLAMS	PSD
Requirements	1. The development, documentation, and implementation of an approved quality system	Same as SLAMS.
	2. The assessment of data quality	
	3. The use of reference, equivalent, or approved methods	
	4. The use of calibration standards traceable to NIST or other primary standard	
	5. The participation in EPA performance evaluations and the permission for EPA to conduct system audits	Same as SLAMS
Monitoring and QA Responsibility	State/local agency via the "primary quality assurance organization"	Source owner/operator.
Monitoring Duration	Indefinitely	Usually up to 12 months.
Annual Performance Evaluation (PE)	Standards and equipment different from those used for spanning, calibration, and verifications. Prefer different personnel	Personnel, standards and equipment different from those used for spanning, calibration, and verifications.
PE audit rate:		
--Automated	100% per year	100% per quarter.
--Manual	Varies depending on pollutant.	100% per quarter.

	See Table A-2 of this appendix	
Precision Assessment:		
--Automated	One-point QC check biweekly but data quality dependent	One point QC check biweekly.
--Manual	Varies depending on pollutant. See Table A-2 of this appendix	One site: 1 every 6 days or every third day for daily monitoring (TSP and Pb).
Reporting		
--Automated	By site--EPA performs calculations annually	By site--source owner/operator performs calculations each sampling quarter.
--Manual	By reporting organization--EPA performs calculations annually	By site--source owner/operator performs calculations each sampling quarter.

Table A-2 of Appendix A to Part 58--Minimum Data Assessment Requirements for SLAMS Sites

Method	Assessment method	Coverage	Minimum frequency	Parameters reported
Automated Methods				
1-Point QC for SO_2, NO_2, O_3, CO	Response check at concentration 0.01-0.1 ppm SO_2, NO_2, O_3, and 1-10 ppm CO	Each analyzer	Once per 2 weeks	Audit concentration[1] and measured concentration[2].

Annual performance evaluation for SO_2, NO_2, O_3, CO	See section 3.2.2 of this appendix	Each analyzer	Once per year	Audit concentration[1] and measured concentration[2] for each level.
Flow rate verification PM_{10}, $PM_{2.5}$, $PM_{10-2.5}$	Check of sampler flow rate	Each sampler	Once every month	Audit flow rate and measured flow rate indicated by the sampler.
Semi-annual flow rate audit PM_{10}, $PM_{2.5}$, $PM_{10-2.5}$	Check of sampler flow rate using independent standard	Each sampler	Once every 6 months	Audit flow rate and measured flow rate indicated by the sampler.
Collocated sampling $PM_{2.5}$, $PM_{10-2.5}$	Collocated samplers	15%	Every 12 days	Primary sampler concentration and duplicate sampler concentration.
Performance evaluation program $PM_{2.5}$, $PM_{10-2.5}$.	Collocated samplers	1. 5 valid audits for primary QA orgs, with ≤5 sites 2. 8 valid audits for primary QA orgs, with >5 sites 3. All samplers in 6 years	Over all 4 quarters	Primary sampler concentration and performance evaluation sampler concentration.
Manual Methods				
Collocated sampling PM_{10}, TSP, $PM_{10-2.5}$, $PM_{2.5}$, Pb-TSP, Pb-PM_{10}.	Collocated samplers	15%	Every 12 days PSD--every 6 days	Primary sampler concentration and duplicate sampler concentration.
Flow rate verification PM_{10} (low	Check of sampler flow rate	Each sampler	Once every month	Audit flow rate and measured flow rate indicated by the

Vol), $PM_{10-2.5}$, $PM_{2.5}$, Pb-PM_{10}.				sampler.
Flow rate verification PM_{10} (High-Vol), TSP, Pb-TSP	Check of sampler flow rate	Each sampler	Once every quarter	Audit flow rate and measured flow rate indicated by the sampler.
Semi-annual flow rate audit PM_{10}, TSP, $PM_{10-2.5}$, $PM_{2.5}$, Pb-TSP, Pb-PM_{10}.	Check of sampler flow rate using independent standard	Each sampler, all locations	Once every 6 months	Audit flow rate and measured flow rate indicated by the sampler.
Pb audit strips Pb-TSP, Pb-PM_{10}.	Check of analytical system with Pb audit strips	Analytical	Each quarter	Actual concentration and audit concentration.
Performance evaluation program $PM_{2.5}$, $PM_{10-2.5}$.	Collocated samplers	1. 5 valid audits for primary QA orgs, with ≤5 sites 2. 8 valid audits for primary QA orgs, with >5 sites 3. All samplers in 6 years	Over all 4 quarters	Primary sampler concentration and performance evaluation sampler concentration.
Performance evaluation program Pb-TSP, Pb-PM_{10}.	Collocated samplers	1. 1 valid audit and 4 collocated samples for primary QA orgs, with >5 sites	Over all 4 quarters	Primary sampler concentration and performance evaluation sampler concentration. Primary sampler concentration and duplicate sampler concentration.

	2. 2 valid audits and 6 collocated samples for primary QA orgs, with >5 sites

Table A-3 of Appendix A to Part 58.--Summary of $PM_{2.5}$ Number and Type of Collocation (15% Collocation Requirement) Needed as an Example of a Primary Quality Assurance Organization That Has 54 Monitors and Procured FRMs and Three Other Equivalent Method Types

Primary sampler method designation	Total no. of monitors	Total no. collocated	No. of collocated FRM	No. of collocated monitors of same method designation as primary
FRM	20	3	3	n/a
FEM (A)	20	3	2	1
FEM (C)	2	1	1	0
FEM (D)	12	2	1	1

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APPENDIX C TO PART 58--AMBIENT AIR QUALITY MONITORING METHODOLOGY

1.0 Purpose

This appendix specifies the criteria pollutant monitoring methods (manual methods or automated analyzers) which must be used in SLAMS and NCore stations that are a subset of SLAMS.

2.0 SLAMS Ambient Air Monitoring Network

2.1 Except as otherwise provided in this appendix, a criteria pollutant monitoring method used for making NAAQS decisions at a SLAMS site must be a reference or equivalent method as defined in § 50.1 of this chapter.

2.1.1 Any NO_2 FRM or FEM used for making primary NAAQS decisions must be capable of providing hourly averaged concentration data.

2.2 Reserved

2.3 Any manual method or analyzer purchased prior to cancellation of its reference or equivalent method designation under § 53.11 or § 53.16 of this chapter may be used at a SLAMS site following cancellation for a reasonable period of time to be determined by the Administrator.

2.4 Approval of Non-designated Continuous $PM_{2.5}$ Methods as Approved Regional Methods (ARMs) Operated Within a Network of Sites. A method for $PM_{2.5}$ that has not been designated as an FRM or FEM as defined in § 50.1 of this chapter may be approved as an ARM for purposes of section 2.1 of this appendix at a particular site or network of sites under the following stipulations.

2.4.1 The candidate ARM must be demonstrated to meet the requirements for $PM_{2.5}$ Class III equivalent methods as defined in subpart C of part 53 of this chapter. Specifically the requirements for precision, correlation, and additive and multiplicative bias apply. For purposes of this section 2.4, the following requirements shall apply:

2.4.1.1 The candidate ARM shall be tested at the site(s) in which it is intended to be used. For a network of sites operated by one reporting agency or primary quality assurance organization, the testing shall occur at a subset of sites to include one site in each MSA/CSA, up to the first 2 highest population MSA/CSA and at least one rural area or Micropolitan Statistical Area site. If the candidate ARM for a network is already approved for purposes of this section in another agency's network, subsequent testing shall minimally occur at one site in a MSA/CSA and one rural area or Micropolitan Statistical Area. There shall be no requirement for tests at any other sites.

2.4.1.2 For purposes of this section, a full year of testing may begin and end in any season, so long as all seasons are covered.

2.4.1.3 No PM_{10} samplers shall be required for the test, as determination of the $PM_{2.5}/PM_{10}$ ratio at the test site shall not be required.

2.4.1.4 The test specification for $PM_{2.5}$ Class III equivalent method precision defined in subpart C of part 53 of this chapter applies; however, there is no specific requirement that collocated continuous monitors be operated for purposes of generating a statistic for coefficient of variation (CV). To provide an estimate of precision that meets the requirement identified in subpart C of part 53 of this chapter, agencies may cite peer-reviewed published data or data in AQS that can be presented demonstrating the candidate ARM operated will produce data that meets the specification for precision of Class III $PM_{2.5}$ methods.

2.4.1.5 A minimum of 90 valid sample pairs per site for the year with no less than 20 valid sample pairs per season must be generated for use in demonstrating that additive bias, multiplicative bias and correlation meet the comparability requirements specified in subpart C of part 53 of this chapter. A valid sample pair may be generated with as little as one valid FRM and one valid candidate ARM measurement per day.

2.4.1.6 For purposes of determining bias, FRM data with concentrations less than 3 micrograms per cubic meter ($\mu g/m^3$) may be excluded. Exclusion of data does not result in failure of sample completeness specified in this section.

2.4.1.7 Data transformations are allowed to be used to demonstrate meeting the comparability requirements specified in subpart C of part 53 of this chapter. Data transformation may be linear or non-linear, but must be applied in the same way to all sites used in the testing.

2.4.2 The monitoring agency wishing to use an ARM must develop and implement appropriate quality assurance procedures for the method. Additionally, the following procedures are required for the method:

2.4.2.1 The ARM must be consistently operated throughout the network. Exceptions to a consistent operation must be approved according to section 2.8 of this appendix;

2.4.2.2 The ARM must be operated on an hourly sampling frequency capable of providing data suitable for aggregation into daily 24–hour average measurements;

2.4.2.3 The ARM must use an inlet and separation device, as needed, that are already approved in either the reference method identified in appendix L to part 50 of this chapter or under part 53 of this chapter as approved for use on a $PM_{2.5}$ reference or equivalent method. The only exceptions to this requirement are those methods that by their inherent measurement principle may not need an inlet or separation device that segregates the aerosol; and

2.4.2.4 The ARM must be capable of providing for flow audits, unless by its inherent measurement principle, measured flow is not required. These flow audits are to be performed on the frequency identified in appendix A to this part.

2.4.2.5 If data transformations are used, they must be described in the monitoring agencies Quality Assurance Project plan (or addendum to QAPP). The QAPP shall describe how often (e.g., quarterly, yearly) and under what provisions the data transformation will be updated. For example, not meeting the data quality objectives for a site over a season or year may be cause for recalculating a data transformation, but by itself would not be cause for invalidating the data. Data transformations must be applied prospectively, i.e., in real-time or near real-time, to the data output from the $PM_{2.5}$ continuous method. See reference 7 of this appendix.

2.4.3 The monitoring agency wishing to use the method must develop and implement appropriate procedures for assessing and reporting the precision and accuracy of the method comparable to the procedures set forth in appendix A of this part for designated reference and equivalent methods.

2.4.4 Assessments of data quality shall follow the same frequencies and calculations as required under section 3 of appendix A to this part with the following exceptions:

2.4.4.1 Collocation of ARM with FRM/FEM samplers must be maintained at a minimum of 30 percent of the required SLAMS sites with a minimum of 1 per network;

2.4.4.2 All collocated FRM/FEM samplers must maintain a sample frequency of at least 1 in 6 sample days;

2.4.4.3 Collocated FRM/FEM samplers shall be located at the design value site, with the required FRM/FEM samplers deployed among the largest MSA/CSA in the network, until all required FRM/FEM are deployed; and

2.4.4.4 Data from collocated FRM/FEM are to be substituted for any calendar quarter that an ARM method has incomplete data.

2.4.4.5 Collocation with an ARM under this part for purposes of determining the coefficient of variation of the method shall be conducted at a minimum of 7.5 percent of the sites with a minimum of 1 per network. This is consistent with the requirements in appendix A to this part for one-half of the required collocation of FRM/FEM (15 percent) to be collocated with the same method.

2.4.4.6 Assessments of bias with an independent audit of the total measurement system shall be conducted with the same frequency as an FEM as identified in appendix A to this part.

2.4.5 Request for approval of a candidate ARM, that is not already approved in another agency's network under this section, must meet the general submittal requirements of section 2.7 of this appendix. Requests for approval under this section when an ARM is already approved in another agency's network are to be submitted to the EPA Regional Administrator. Requests for approval under section 2.4 of this appendix must include the following requirements:

2.4.5.1 A clear and unique description of the site(s) at which the candidate ARM will be used and tested, and a description of the nature or character of the site and the particulate matter that is expected to occur there.

2.4.5.2 A detailed description of the method and the nature of the sampler or analyzer upon which it is based.

2.4.5.3 A brief statement of the reason or rationale for requesting the approval.

2.4.5.4 A detailed description of the quality assurance procedures that have been developed and that will be implemented for the method.

2.4.5.5 A detailed description of the procedures for assessing the precision and accuracy of the method that will be implemented for reporting to AQS.

2.4.5.6 Test results from the comparability tests as required in section 2.4.1 through 2.4.1.4 of this appendix.

2.4.5.7 Such further supplemental information as may be necessary or helpful to support the required statements and test results.

2.4.6 Within 120 days after receiving a request for approval of the use of an ARM at a particular site or network of sites under section 2.4 of this appendix, the Administrator will approve or disapprove the method by letter to the person or agency requesting such approval. When appropriate for methods that are already approved in another SLAMS network, the EPA Regional Administrator has approval/disapproval authority. In either instance, additional information may be requested to assist with the decision.

2.5 [Reserved]

2.6 Use of Methods With Higher, Nonconforming Ranges in Certain Geographical Areas.

2.6.1 [Reserved]

2.6.2 An analyzer may be used (indefinitely) on a range which extends to concentrations higher than two times the upper limit specified in table B–1 of part 53 of this chapter if:

2.6.2.1 The analyzer has more than one selectable range and has been designated as a reference or equivalent method on at least one of its ranges, or has been approved for use under section 2.5 (which applies to analyzers purchased before February 18, 1975);

2.6.2.2 The pollutant intended to be measured with the analyzer is likely to occur in concentrations more than two times the upper range limit specified in table B–1 of part 53 of this chapter in the geographical area in which use of the analyzer is proposed; and

2.6.2.3 The Administrator determines that the resolution of the range or ranges for which approval is sought is adequate for its intended use. For purposes of this section (2.6), "resolution" means the ability of the analyzer to detect small changes in concentration.

2.6.3 Requests for approval under section 2.6.2 of this appendix must meet the submittal requirements of section 2.7. Except as provided in section 2.7.3 of this appendix, each request must contain the information specified in section 2.7.2 in addition to the following:

2.6.3.1 The range or ranges proposed to be used;

2.6.3.2 Test data, records, calculations, and test results as specified in section 2.7.2.2 of this appendix for each range proposed to be used;

2.6.3.3 An identification and description of the geographical area in which use of the analyzer is proposed;

2.6.3.4 Data or other information demonstrating that the pollutant intended to be measured with the analyzer is likely to occur in concentrations more than two times the upper range limit specified in table B–1 of part 53 of this chapter in the geographical area in which use of the analyzer is proposed; and

2.6.3.5 Test data or other information demonstrating the resolution of each proposed range that is broader than that permitted by section 2.5 of this appendix.

2.6.4 Any person who has obtained approval of a request under this section (2.6.2) shall assure that the analyzer for which approval was obtained is used only in the geographical area identified in the request and only while operated in the range or ranges specified in the request.

2.7 Requests for Approval; Withdrawal of Approval.

2.7.1 Requests for approval under sections 2.4, 2.6.2, or 2.8 of this appendix must be submitted to: Director, National Exposure Research Laboratory (MD–D205–03), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. For ARM that are already approved in another agency's network, subsequent requests for approval under section 2.4 are to be submitted to the applicable EPA Regional Administrator.

2.7.2 Except as provided in section 2.7.3 of this appendix, each request must contain:

2.7.2.1 A statement identifying the analyzer (e.g., by serial number) and the method of which the analyzer is representative (e.g., by manufacturer and model number); and

2.7.2.2 Test data, records, calculations, and test results for the analyzer (or the method of which the analyzer is representative) as specified in subpart B, subpart C, or both (as applicable) of part 53 of this chapter.

2.7.3 A request may concern more than one analyzer or geographical area and may incorporate by reference any data or other information known to EPA from one or more of the following:

2.7.3.1 An application for a reference or equivalent method determination submitted to EPA for the method of which the analyzer is representative, or testing conducted by the applicant or by EPA in connection with such an application;

2.7.3.2 Testing of the method of which the analyzer is representative at the initiative of the Administrator under § 53.7 of this chapter; or

2.7.3.3 A previous or concurrent request for approval submitted to EPA under this section (2.7).

2.7.4 To the extent that such incorporation by reference provides data or information required by this section (2.7) or by sections 2.4, 2.5, or 2.6 of this appendix, independent data or duplicative information need not be submitted.

2.7.5 After receiving a request under this section (2.7), the Administrator may request such additional testing or information or conduct such tests as may be necessary in his judgment for a decision on the request.

2.7.6 If the Administrator determines, on the basis of any available information, that any of the determinations or statements on which approval of a request under this section was based are invalid or no longer valid, or that the requirements of section 2.4, 2.5, or 2.6, as applicable, have not been met, he/she may withdraw the approval after affording the person who obtained the approval an opportunity to submit information and arguments opposing such action.

2.8 Modifications of Methods by Users.

2.8.1 Except as otherwise provided in this section, no reference method, equivalent method, or ARM may be used in a SLAMS network if it has been modified in a manner that could significantly alter the performance characteristics of the method

without prior approval by the Administrator. For purposes of this section, "alternative method" means an analyzer, the use of which has been approved under section 2.4, 2.5, or 2.6 of this appendix or some combination thereof.

2.8.2 Requests for approval under this section (2.8) must meet the submittal requirements of sections 2.7.1 and 2.7.2.1 of this appendix.

2.8.3 Each request submitted under this section (2.8) must include:

2.8.3.1 A description, in such detail as may be appropriate, of the desired modification;

2.8.3.2 A brief statement of the purpose(s) of the modification, including any reasons for considering it necessary or advantageous;

2.8.3.3 A brief statement of belief concerning the extent to which the modification will or may affect the performance characteristics of the method; and

2.8.3.4 Such further information as may be necessary to explain and support the statements required by sections 2.8.3.2 and 2.8.3.3.

2.8.4 The Administrator will approve or disapprove the modification by letter to the person or agency requesting such approval within 75 days after receiving a request for approval under this section and any further information that the applicant may be asked to provide.

2.8.5 A temporary modification that could alter the performance characteristics of a reference, equivalent, or ARM may be made without prior approval under this section if the method is not functioning or is malfunctioning, provided that parts necessary for repair in accordance with the applicable operation manual cannot be obtained within 45 days. Unless such temporary modification is later approved under section 2.8.4 of this appendix, the temporarily modified method shall be repaired in accordance with the applicable operation manual as quickly as practicable but in no event later than 4 months after the temporary modification was made, unless an extension of time is granted by the Administrator. Unless and until the temporary modification is approved, air quality data obtained with the method as temporarily modified must be clearly identified as such when submitted in accordance with § 58.16 and must be accompanied by a report containing the information specified in section 2.8.3 of this appendix. A request that the Administrator approve a temporary modification may be submitted in accordance with sections 2.8.1 through 2.8.4 of this appendix. In such cases the request will be considered as if a request for prior approval had been made.

2.9 Use of IMPROVE Samplers at a SLAMS Site. "IMPROVE" samplers may be used in SLAMS for monitoring of regional background and regional transport concentrations of fine particulate matter. The IMPROVE samplers were developed for use in the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to characterize all of the major components and many trace constituents of the particulate matter that impair visibility in Federal Class I Areas. Descriptions of the IMPROVE samplers and the data they collect are available in references 4, 5, and 6 of this appendix.

2.10 Use of Pb–PM10 at SLAMS Sites.

2.10.1 The EPA Regional Administrator may approve the use of a Pb–PM_{10} FRM or Pb–PM_{10} FEM sampler in lieu of a Pb–TSP sampler as part of the network plan required under part 58.10(a)(4) in the following cases.

2.10.1.1 Pb–PM_{10} samplers can be approved for use at the non-source-oriented sites required under paragraph 4.5(b) of Appendix D to part 58 if there is no existing monitoring data indicating that the maximum arithmetic 3–month mean Pb concentration (either Pb–TSP or Pb–PM_{10}) at the site was equal to or greater than 0.10 micrograms per cubic meter during the previous 3 years.

2.10.1.2 Pb–PM_{10} samplers can be approved for use at source-oriented sites required under paragraph 4.5(a) if the monitoring agency can demonstrate (through modeling or historic monitoring data from the last 3 years) that Pb concentrations (either Pb–TSP or Pb–PM_{10}) will not equal or exceed 0.10 micrograms per cubic meter on an arithmetic 3–month mean and the source is expected to emit a substantial majority of its Pb in the fraction of PM with an aerodynamic diameter of less than or equal to 10 micrometers.

2.10.2 The approval of a Pb–PM_{10} sampler in lieu of a Pb–TSP sampler as allowed for in paragraph 2.10.1 above will be revoked if measured Pb–PM_{10} concentrations equal or exceed 0.10 micrograms per cubic meter on an arithmetic 3–month mean. Monitoring agencies will have up to 6 months from the end of the 3–month period in which the arithmetic 3–month Pb–PM_{10} mean concentration equaled or exceeded 0.10 micrograms per cubic meter to install and begin operation of a Pb–TSP sampler at the site.

3.0 NCore Ambient Air Monitoring Stations

3.1 Methods employed in NCore multipollutant sites used to measure SO_2, CO, NO_2, O_3, $PM_{2.5}$, or $PM_{10–2.5}$ must be reference or equivalent methods as defined in

§ 50.1 of this chapter, or an ARM as defined in section 2.4 of this appendix, for any monitors intended for comparison with applicable NAAQS.

3.2 If alternative SO_2, CO, NO_2, O_3, $PM_{2.5}$, or $PM_{10–2.5}$ monitoring methodologies are proposed for monitors not intended for NAAQS comparison, such techniques must be detailed in the network description required by § 58.10 and subsequently approved by the Administrator. Examples of locations that are not intended to be compared to the NAAQS may be rural background and transport sites or areas where the concentration of the pollutant is so low that it would be more useful to operate a higher sensitivity method that is not an FRM or FEM.

4.0 Photochemical Assessment Monitoring Stations (PAMS)

4.1 Methods used for O_3 monitoring at PAMS must be automated reference or equivalent methods as defined in § 50.1 of this chapter.

4.2 Methods used for NO, NO_2 and NO_X monitoring at PAMS should be automated reference or equivalent methods as defined for NO_2 in § 50.1 of this chapter. If alternative NO, NO_2 or NO_X monitoring methodologies are proposed, such techniques must be detailed in the network description required by § 58.10 and subsequently approved by the Administrator.

4.3 Methods for meteorological measurements and speciated VOC monitoring are included in the guidance provided in references 2 and 3 of this appendix. If alternative VOC monitoring methodology (including the use of new or innovative technologies), which is not included in the guidance, is proposed, it must be detailed in the network description required by § 58.10 and subsequently approved by the Administrator.

5.0 Particulate Matter Episode Monitoring

5.1 For short-term measurements of PM_{10} during air pollution episodes (see § 51.152 of this chapter) the measurement method must be:

5.1.1 Either the "Staggered PM_{10}" method or the "PM_{10} Sampling Over Short Sampling Times" method, both of which are based on the reference method for PM_{10} and are described in reference 1: or

5.1.2 Any other method for measuring PM_{10} :

5.1.2.1 Which has a measurement range or ranges appropriate to accurately measure air pollution episode concentration of PM_{10},

5.1.2.2 Which has a sample period appropriate for short-term PM_{10} measurements, and

5.1.2.3 For which a quantitative relationship to a reference or equivalent method for PM_{10} has been established at the use site. Procedures for establishing a quantitative site-specific relationship are contained in reference 1.

5.2 PM_{10} methods other than the reference method are not covered under the quality assessment requirements of appendix to this part. Therefore, States must develop and implement their own quality assessment procedures for those methods allowed under this section 4. These quality assessment procedures should be similar or analogous to those described in section 3 of appendix A to this part for the PM_{10} reference method.

6.0 References

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40 C.F.R. § 58 App. D

APPENDIX D TO PART 58--NETWORK DESIGN CRITERIA FOR AMBIENT AIR QUALITY MONITORING

1. Monitoring Objectives and Spatial Scales

The purpose of this appendix is to describe monitoring objectives and general criteria to be applied in establishing the required SLAMS ambient air quality monitoring stations and for choosing general locations for additional monitoring sites. This appendix also describes specific requirements for the number and location of FRM, FEM, and ARM sites for specific pollutants, NCore multipollutant sites, PM_{10} mass sites, $PM_{2.5}$ mass sites, chemically-speciated $PM_{2.5}$ sites, and O_3 precursor measurements sites (PAMS). These criteria will be used by EPA in evaluating the adequacy of the air pollutant monitoring networks.

1.1 Monitoring Objectives. The ambient air monitoring networks must be designed to meet three basic monitoring objectives. These basic objectives are listed below. The appearance of any one objective in the order of this list is not based upon a prioritized scheme. Each objective is important and must be considered individually.

(a) Provide air pollution data to the general public in a timely manner. Data can be presented to the public in a number of attractive ways including through air quality maps, newspapers, Internet sites, and as part of weather forecasts and public advisories.

(b) Support compliance with ambient air quality standards and emissions strategy development. Data from FRM, FEM, and ARM monitors for NAAQS pollutants will be used for comparing an area's air pollution levels against the NAAQS. Data from monitors of various types can be used in the development of attainment and

maintenance plans. SLAMS, and especially NCore station data, will be used to evaluate the regional air quality models used in developing emission strategies, and to track trends in air pollution abatement control measures' impact on improving air quality. In monitoring locations near major air pollution sources, source-oriented monitoring data can provide insight into how well industrial sources are controlling their pollutant emissions.

(c) Support for air pollution research studies. Air pollution data from the NCore network can be used to supplement data collected by researchers working on health effects assessments and atmospheric processes, or for monitoring methods development work.

1.1.1 In order to support the air quality management work indicated in the three basic air monitoring objectives, a network must be designed with a variety of types of monitoring sites. Monitoring sites must be capable of informing managers about many things including the peak air pollution levels, typical levels in populated areas, air pollution transported into and outside of a city or region, and air pollution levels near specific sources. To summarize some of these sites, here is a listing of six general site types:

(a) Sites located to determine the highest concentrations expected to occur in the area covered by the network.

(b) Sites located to measure typical concentrations in areas of high population density.

(c) Sites located to determine the impact of significant sources or source categories on air quality.

(d) Sites located to determine general background concentration levels.

(e) Sites located to determine the extent of regional pollutant transport among populated areas; and in support of secondary standards.

(f) Sites located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts.

1.1.2 This appendix contains criteria for the basic air monitoring requirements. The total number of monitoring sites that will serve the variety of data needs will be substantially higher than these minimum requirements provide. The optimum size of a particular network involves trade-offs among data needs and available resources. This regulation intends to provide for national air monitoring needs, and

to lend support for the flexibility necessary to meet data collection needs of area air quality managers. The EPA, State, and local agencies will periodically collaborate on network design issues through the network assessment process outlined in § 58.10.

1.1.3 This appendix focuses on the relationship between monitoring objectives, site types, and the geographic location of monitoring sites. Included are a rationale and set of general criteria for identifying candidate site locations in terms of physical characteristics which most closely match a specific monitoring objective. The criteria for more specifically locating the monitoring site, including spacing from roadways and vertical and horizontal probe and path placement, are described in appendix E to this part.

1.2 Spatial Scales. (a) To clarify the nature of the link between general monitoring objectives, site types, and the physical location of a particular monitor, the concept of spatial scale of representativeness is defined. The goal in locating monitors is to correctly match the spatial scale represented by the sample of monitored air with the spatial scale most appropriate for the monitoring site type, air pollutant to be measured, and the monitoring objective.

(b) Thus, spatial scale of representativeness is described in terms of the physical dimensions of the air parcel nearest to a monitoring site throughout which actual pollutant concentrations are reasonably similar. The scales of representativeness of most interest for the monitoring site types described above are as follows:

(1) Microscale--Defines the concentrations in air volumes associated with area dimensions ranging from several meters up to about 100 meters.

(2) Middle scale--Defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometer.

(3) Neighborhood scale--Defines concentrations within some extended area of the city that has relatively uniform land use with dimensions in the 0.5 to 4.0 kilometers range. The neighborhood and urban scales listed below have the potential to overlap in applications that concern secondarily formed or homogeneously distributed air pollutants.

(4) Urban scale--Defines concentrations within an area of city-like dimensions, on the order of 4 to 50 kilometers. Within a city, the geographic placement of sources may result in there being no single site that can be said to represent air quality on an urban scale.

(5) Regional scale--Defines usually a rural area of reasonably homogeneous geography without large sources, and extends from tens to hundreds of kilometers.

(6) National and global scales--These measurement scales represent concentrations characterizing the nation and the globe as a whole.

(c) Proper siting of a monitor requires specification of the monitoring objective, the types of sites necessary to meet the objective, and then the desired spatial scale of representativeness. For example, consider the case where the objective is to determine NAAQS compliance by understanding the maximum ozone concentrations for an area. Such areas would most likely be located downwind of a metropolitan area, quite likely in a suburban residential area where children and other susceptible individuals are likely to be outdoors. Sites located in these areas are most likely to represent an urban scale of measurement. In this example, physical location was determined by considering ozone precursor emission patterns, public activity, and meteorological characteristics affecting ozone formation and dispersion. Thus, spatial scale of representativeness was not used in the selection process but was a result of site location.

(d) In some cases, the physical location of a site is determined from joint consideration of both the basic monitoring objective and the type of monitoring site desired, or required by this appendix. For example, to determine $PM_{2.5}$ concentrations which are typical over a geographic area having relatively high $PM_{2.5}$ concentrations, a neighborhood scale site is more appropriate. Such a site would likely be located in a residential or commercial area having a high overall $PM_{2.5}$ emission density but not in the immediate vicinity of any single dominant source. Note that in this example, the desired scale of representativeness was an important factor in determining the physical location of the monitoring site.

(e) In either case, classification of the monitor by its type and spatial scale of representativeness is necessary and will aid in interpretation of the monitoring data for a particular monitoring objective (e.g., public reporting, NAAQS compliance, or research support).

(f) Table D–1 of this appendix illustrates the relationship between the various site types that can be used to support the three basic monitoring objectives, and the scales of representativeness that are generally most appropriate for that type of site.

Table D-1 of Appendix D to Part 58. Relationship Between Site Types and Scales of Representativeness

Site type	Appropriate siting scales
1. Highest concentration	Micro, middle, neighborhood (sometimes urban or regional for secondarily formed pollutants).
2. Population oriented	Neighborhood, urban.
3. Source impact	Micro, middle, neighborhood.
4. General/background & regional transport	Urban, regional.
5. Welfare-related impacts	Urban, regional.

2. General Monitoring Requirements

(a) The National ambient air monitoring system includes several types of monitoring stations, each targeting a key data collection need and each varying in technical sophistication.

(b) Research grade sites are platforms for scientific studies, either involved with health or welfare impacts, measurement methods development, or other atmospheric studies. These sites may be collaborative efforts between regulatory agencies and researchers with specific scientific objectives for each. Data from these sites might be collected with both traditional and experimental techniques, and data collection might involve specific laboratory analyses not common in routine measurement programs. The research grade sites are not required by regulation; however, they are included here due to their important role in supporting the air quality management program.

(c) The NCore multipollutant sites are sites that measure multiple pollutants in order to provide support to integrated air quality management data needs. NCore sites include both neighborhood and urban scale measurements in general, in a selection of metropolitan areas and a limited number of more rural locations. Continuous monitoring methods are to be used at the NCore sites when available for a pollutant to be measured, as it is important to have data collected over common time periods for integrated analyses. NCore multipollutant sites are

intended to be long-term sites useful for a variety of applications including air quality trends analyses, model evaluation, and tracking metropolitan area statistics. As such, the NCore sites should be placed away from direct emission sources that could substantially impact the ability to detect area-wide concentrations. The Administrator must approve the NCore sites.

(d) Monitoring sites designated as SLAMS sites, but not as NCore sites, are intended to address specific air quality management interests, and as such, are frequently single-pollutant measurement sites. The EPA Regional Administrator must approve the SLAMS sites.

(e) This appendix uses the statistical-based definitions for metropolitan areas provided by the Office of Management and Budget and the Census Bureau. These areas are referred to as metropolitan statistical areas (MSA), micropolitan statistical areas, core-based statistical areas (CBSA), and combined statistical areas (CSA). A CBSA associated with at least one urbanized area of 50,000 population or greater is termed a Metropolitan Statistical Area (MSA). A CBSA associated with at least one urbanized cluster of at least 10,000 population or greater is termed a Micropolitan Statistical Area. CSA consist of two or more adjacent CBSA. In this appendix, the term MSA is used to refer to a Metropolitan Statistical Area. By definition, both MSA and CSA have a high degree of integration; however, many such areas cross State or other political boundaries. MSA and CSA may also cross more than one air shed. The EPA recognizes that State or local agencies must consider MSA/CSA boundaries and their own political boundaries and geographical characteristics in designing their air monitoring networks. The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator.

3. Design Criteria for NCore Sites

(a) Each State (i.e. the fifty States, District of Columbia, Puerto Rico, and the Virgin Islands) is required to operate at least one NCore site. States may delegate this requirement to a local agency. States with many MSAs often also have multiple air sheds with unique characteristics and, often, elevated air pollution. These States include, at a minimum, California, Florida, Illinois, Michigan, New York, North Carolina, Ohio, Pennsylvania, and Texas. These States are required to identify one to two additional NCore sites in order to account for their unique

situations. These additional sites shall be located to avoid proximity to large emission sources. Any State or local agency can propose additional candidate NCore sites or modifications to these requirements for approval by the Administrator. The NCore locations should be leveraged with other multipollutant air monitoring sites including PAMS sites, National Air Toxics Trends Stations (NATTS) sites, CASTNET sites, and STN sites. Site leveraging includes using the same monitoring platform and equipment to meet the objectives of the variety of programs where possible and advantageous.

(b) The NCore sites must measure, at a minimum, $PM_{2.5}$ particle mass using continuous and integrated/filter-based samplers, speciated $PM_{2.5}$, $PM_{10–2.5}$ particle mass, speciated $PM_{10–2.5}$, O_3, SO_2, CO, NO/NO_y, wind speed, wind direction, relative humidity, and ambient temperature. NCore sites in CBSA with a population of 500,000 people (as determined in the latest Census) or greater shall also measure Pb either as Pb–TSP or Pb–PM_{10}. The EPA Regional Administrator may approve an alternative location for the Pb measurement where the alternative location would be more appropriate for logistical reasons and the measurement would provide data on typical Pb concentrations in the CBSA.

(1) Although the measurement of NO_y is required in support of a number of monitoring objectives, available commercial instruments may indicate little difference in their measurement of NO_y compared to the conventional measurement of NO_X, particularly in areas with relatively fresh sources of nitrogen emissions. Therefore, in areas with negligible expected difference between NO_y and NO_X measured concentrations, the Administrator may allow for waivers that permit NO_X monitoring to be substituted for the required NO_y monitoring at applicable NCore sites.

(2) EPA recognizes that, in some cases, the physical location of the NCore site may not be suitable for representative meteorological measurements due to the site's physical surroundings. It is also possible that nearby meteorological measurements may be able to fulfill this data need. In these cases, the requirement for meteorological monitoring can be waived by the Administrator.

(c) [Reserved by 75 FR 81137]

(d) Siting criteria are provided for urban and rural locations. Sites with significant historical records that do not meet siting criteria may be approved as NCore by the Administrator. Sites with the suite of NCore measurements that are explicitly designed for other monitoring objectives are exempt from these siting criteria (e.g., a near-roadway site).

(1) Urban NCore stations are to be generally located at urban or neighborhood scale to provide representative concentrations of exposure expected throughout the metropolitan area; however, a middle-scale site may be acceptable in cases where the site can represent many such locations throughout a metropolitan area.

(2) Rural NCore stations are to be located to the maximum extent practicable at a regional or larger scale away from any large local emission source, so that they represent ambient concentrations over an extensive area.

4. Pollutant–Specific Design Criteria for SLAMS Sites

4.1 Ozone (O_3) Design Criteria. (a) State, and where appropriate, local agencies must operate O_3 sites for various locations depending upon area size (in terms of population and geographic characteristics) and typical peak concentrations (expressed in percentages below, or near the O_3 NAAQS). Specific SLAMS O_3 site minimum requirements are included in Table D–2 of this appendix. The NCore sites are expected to complement the O_3 data collection that takes place at single-pollutant SLAMS sites, and both types of sites can be used to meet the network minimum requirements. The total number of O_3 sites needed to support the basic monitoring objectives of public data reporting, air quality mapping, compliance, and understanding O_3-related atmospheric processes will include more sites than these minimum numbers required in Table D–2 of this appendix. The EPA Regional Administrator and the responsible State or local air monitoring agency must work together to design and/or maintain the most appropriate O_3 network to service the variety of data needs in an area.

Table D-2 of Appendix D to Part 58.--SLAMS Minimum O_3 Monitoring Requirements

MSA population[1,2]	Most recent 3-year design value concentrations ⩾85% of any O_3 NAAQS[3]	Most recent 3-year design value concentrations <85% of any O_3 NAAQS[3,4]
>10 million	4	2
4–10 million	3	1
350,000–<4 million	2	1
50,000–<350,000[5]	1	0

(b) Within an O_3 network, at least one O_3 site for each MSA, or CSA if multiple MSAs are involved, must be designed to record the maximum concentration for that particular metropolitan area. More than one maximum concentration site may be necessary in some areas. Table D–2 of this appendix does not account for the full breadth of additional factors that would be considered in designing a complete O_3 monitoring program for an area. Some of these additional factors include geographic size, population density, complexity of terrain and meteorology, adjacent O_3 monitoring programs, air pollution transport from neighboring areas, and measured air quality in comparison to all forms of the O_3 NAAQS (i.e., 8–hour and 1–hour forms). Networks must be designed to account for all of these area characteristics. Network designs must be re-examined in periodic network assessments. Deviations from the above O_3 requirements are allowed if approved by the EPA Regional Administrator.

(c) The appropriate spatial scales for O_3 sites are neighborhood, urban, and regional. Since O_3 requires appreciable formation time, the mixing of reactants and products occurs over large volumes of air, and this reduces the importance of monitoring small scale spatial variability.

(1) Neighborhood scale--Measurements in this category represent conditions throughout some reasonably homogeneous urban sub-region, with dimensions of a few kilometers. Homogeneity refers to pollutant concentrations. Neighborhood scale data will provide valuable information for developing, testing, and revising concepts and models that describe urban/regional concentration patterns. These data will be useful to the understanding and definition of processes that take periods of hours to occur and hence involve considerable mixing and transport. Under stagnation conditions, a site located in the neighborhood scale may also experience peak concentration levels within a metropolitan area.

(2) Urban scale--Measurement in this scale will be used to estimate concentrations over large portions of an urban area with dimensions of several kilometers to 50 or more kilometers. Such measurements will be used for determining trends, and designing area-wide control strategies. The urban scale sites would also be used to measure high concentrations downwind of the area having the highest precursor emissions.

(3) Regional scale--This scale of measurement will be used to typify concentrations over large portions of a metropolitan area and even larger areas with dimensions of as much as hundreds of kilometers. Such measurements will be useful for assessing the O_3 that is transported to and from a metropolitan area, as

well as background concentrations. In some situations, particularly when considering very large metropolitan areas with complex source mixtures, regional scale sites can be the maximum concentration location.

(d) EPA's technical guidance documents on O_3 monitoring network design should be used to evaluate the adequacy of each existing O_3 monitor, to relocate an existing site, or to locate any new O_3 sites.

(e) For locating a neighborhood scale site to measure typical city concentrations, a reasonably homogeneous geographical area near the center of the region should be selected which is also removed from the influence of major NO_X sources. For an urban scale site to measure the high concentration areas, the emission inventories should be used to define the extent of the area of important nonmethane hydrocarbons and NO_X emissions. The meteorological conditions that occur during periods of maximum photochemical activity should be determined. These periods can be identified by examining the meteorological conditions that occur on the highest O_3 air quality days. Trajectory analyses, an evaluation of wind and emission patterns on high O_3 days, can also be useful in evaluating an O_3 monitoring network. In areas without any previous O_3 air quality measurements, meteorological and O_3 precursor emissions information would be useful.

(f) Once the meteorological and air quality data are reviewed, the prospective maximum concentration monitor site should be selected in a direction from the city that is most likely to observe the highest O_3 concentrations, more specifically, downwind during periods of photochemical activity. In many cases, these maximum concentration O_3 sites will be located 10 to 30 miles or more downwind from the urban area where maximum O_3 precursor emissions originate. The downwind direction and appropriate distance should be determined from historical meteorological data collected on days which show the potential for producing high O_3 levels. Monitoring agencies are to consult with their EPA Regional Office when considering siting a maximum O_3 concentration site.

(g) In locating a neighborhood scale site which is to measure high concentrations, the same procedures used for the urban scale are followed except that the site should be located closer to the areas bordering on the center city or slightly further downwind in an area of high density population.

(h) For regional scale background monitoring sites, similar meteorological analysis as for the maximum concentration sites may also inform the decisions for locating regional scale sites. Regional scale sites may be located to provide data on O_3 transport between cities, as background sites, or for other data collection purposes.

Consideration of both area characteristics, such as meteorology, and the data collection objectives, such as transport, must be jointly considered for a regional scale site to be useful.

(i) Since O_3 levels decrease significantly in the colder parts of the year in many areas, O_3 is required to be monitored at SLAMS monitoring sites only during the "ozone season" as designated in the AQS files on a State-by–State basis and described below in Table D–3 of this appendix. Deviations from the O_3 monitoring season must be approved by the EPA Regional Administrator, documented within the annual monitoring network plan, and updated in AQS. Information on how to analyze O_3 data to support a change to the O_3 season in support of the 8–hour standard for a specific State can be found in reference 8 to this appendix.

Table D-3 to Appendix D of Part 58. Ozone Monitoring Season by State

State	Begin month	End month
Alabama	March	October
Alaska	April	October
Arizona	January	December
Arkansas	March	November
California	January	December
Colorado	March	September
Connecticut	April	September
Delaware	April	October
District of Columbia	April	October
Florida	March	October
Georgia	March	October
Hawaii	January	December
Idaho	May	September
Illinois	April	October
Indiana	April	September

Iowa	April	October
Kansas	April	October
Kentucky	March	October
Louisiana AQCR 019,022	March	October
Louisiana AQCR 106	January	December
Maine	April	September
Maryland	April	October
Massachusetts	April	September
Michigan	April	September
Minnesota	April	October
Mississippi	March	October
Missouri	April	October
Montana	June	September
Nebraska	April	October
Nevada	January	December
New Hampshire	April	September
New Jersey	April	October
New Mexico	January	December
New York	April	October
North Carolina	April	October
North Dakota	May	September
Ohio	April	October

Oklahoma	March	November
Oregon	May	September
Pennsylvania	April	October
Puerto Rico	January	December
Rhode Island	April	September
South Carolina	April	October
South Dakota	June	September
Tennessee	March	October
Texas AQCR 106,153, 213, 214, 216	January	December
Texas AQCR 022, 210, 211, 212, 215, 217, 218	March	October
Utah	May	September
Vermont	April	September
Virginia	April	October
Washington	May	September
West Virginia	April	October
Wisconsin	April 15	October 15
Wyoming	April	October
American Samoa	January	December
Guam	January	December
Virgin Islands	January	December

4.2 Carbon Monoxide (CO) Design Criteria

4.2.1 General Requirements. (a) Except as provided in subsection (b), one CO monitor is required to operate collocated with one required near-road NO_2 monitor, as required in Section 4.3.2 of this part, in CBSAs having a population of

1,000,000 or more persons. If a CBSA has more than one required near-road NO_2 monitor, only one CO monitor is required to be collocated with a near-road NO_2 monitor within that CBSA.

(b) If a state provides quantitative evidence demonstrating that peak ambient CO concentrations would occur in a near-road location which meets microscale siting criteria in Appendix E of this part but is not a near-road NO_2 monitoring site, then the EPA Regional Administrator may approve a request by a state to use such an alternate near-road location for a CO monitor in place of collocating a monitor at near-road NO_2 monitoring site.

4.2.2 Regional Administrator Required Monitoring. (a) The Regional Administrators, in collaboration with states, may require additional CO monitors above the minimum number of monitors required in 4.2.1 of this part, where the minimum monitoring requirements are not sufficient to meet monitoring objectives. The Regional Administrator may require, at his/her discretion, additional monitors in situations where data or other information suggest that CO concentrations may be approaching or exceeding the NAAQS. Such situations include, but are not limited to, (1) characterizing impacts on ground-level concentrations due to stationary CO sources, (2) characterizing CO concentrations in downtown areas or urban street canyons, and (3) characterizing CO concentrations in areas that are subject to high ground level CO concentrations particularly due to or enhanced by topographical and meteorological impacts. The Regional Administrator and the responsible State or local air monitoring agency shall work together to design and maintain the most appropriate CO network to address the data needs for an area, and include all monitors under this provision in the annual monitoring network plan.

4.2.3 CO Monitoring Spatial Scales. (a) Microscale and middle scale measurements are the most useful site classifications for CO monitoring sites since most people have the potential for exposure on these scales. Carbon monoxide maxima occur primarily in areas near major roadways and intersections with high traffic density and often in areas with poor atmospheric ventilation.

(1) Microscale--Microscale measurements typically represent areas in close proximity to major roadways, within street canyons, over sidewalks, and in some cases, point and area sources. Emissions on roadways result in high ground level CO concentrations at the microscale, where concentration gradients generally exhibit a marked decrease with increasing downwind distance from major roads, or within downtown areas including urban street canyons. Emissions from stationary

point and area sources, and non-road sources may, under certain plume conditions, result in high ground level concentrations at the microscale.

(2) Middle scale--Middle scale measurements are intended to represent areas with dimensions from 100 meters to 0.5 kilometer. In certain cases, middle scale measurements may apply to areas that have a total length of several kilometers, such as “line” emission source areas. This type of emission sources areas would include air quality along a commercially developed street or shopping plaza, freeway corridors, parking lots and feeder streets.

(3) Neighborhood scale--Neighborhood scale measurements are intended to represent areas with dimensions from 0.5 kilometers to 4 kilometers. Measurements of CO in this category would represent conditions throughout some reasonably urban sub-regions. In some cases, neighborhood scale data may represent not only the immediate neighborhood spatial area, but also other similar such areas across the larger urban area. Neighborhood scale measurements provide relative area-wide concentration data which are useful for providing relative urban background concentrations, supporting health and scientific research, and for use in modeling.

4.3 Nitrogen Dioxide (NO_2) Design Criteria

4.3.1 General Requirements

(a) State and, where appropriate, local agencies must operate a minimum number of required NO_2 monitoring sites as described below.

4.3.2 Requirement for Near-road NO_2 Monitors

(a) Within the NO_2 network, there must be one microscale near-road NO_2 monitoring station in each CBSA with a population of 500,000 or more persons to monitor a location of expected maximum hourly concentrations sited near a major road with high AADT counts as specified in paragraph 4.3.2(a)(1) of this appendix. An additional near-road NO_2 monitoring station is required for any CBSA with a population of 2,500,000 persons or more, or in any CBSA with a population of 500,000 or more persons that has one or more roadway segments with 250,000 or greater AADT counts to monitor a second location of expected maximum hourly concentrations. CBSA populations shall be based on the latest available census figures.

(1) The near-road NO_2 monitoring stations shall be selected by ranking all road segments within a CBSA by AADT and then identifying a location or locations

adjacent to those highest ranked road segments, considering fleet mix, roadway design, congestion patterns, terrain, and meteorology, where maximum hourly NO_2 concentrations are expected to occur and siting criteria can be met in accordance with appendix E of this part. Where a State or local air monitoring agency identifies multiple acceptable candidate sites where maximum hourly NO_2 concentrations are expected to occur, the monitoring agency shall consider the potential for population exposure in the criteria utilized to select the final site location. Where one CBSA is required to have two near-road NO_2 monitoring stations, the sites shall be differentiated from each other by one or more of the following factors: fleet mix; congestion patterns; terrain; geographic area within the CBSA; or different route, interstate, or freeway designation.

(b) Measurements at required near-road NO_2 monitor sites utilizing chemiluminescence FRMs must include at a minimum: NO, NO_2, and NO_X.

4.3.3 Requirement for Area-wide NO_2 Monitoring

(a) Within the NO_2 network, there must be one monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected highest NO_2 concentrations representing the neighborhood or larger spatial scales. PAMS sites collecting NO_2 data that are situated in an area of expected high NO_2 concentrations at the neighborhood or larger spatial scale may be used to satisfy this minimum monitoring requirement when the NO_2 monitor is operated year round. Emission inventories and meteorological analysis should be used to identify the appropriate locations within a CBSA for locating required area-wide NO_2 monitoring stations. CBSA populations shall be based on the latest available census figures.

4.3.4 Regional Administrator Required Monitoring

(a) The Regional Administrators, in collaboration with States, must require a minimum of forty additional NO_2 monitoring stations nationwide in any area, inside or outside of CBSAs, above the minimum monitoring requirements, with a primary focus on siting these monitors in locations to protect susceptible and vulnerable populations. The Regional Administrators, working with States, may also consider additional factors described in paragraph (b) below to require monitors beyond the minimum network requirement.

(b) The Regional Administrators may require monitors to be sited inside or outside of CBSAs in which:

(i) The required near-road monitors do not represent all locations of expected maximum hourly NO_2 concentrations in an area and NO_2 concentrations may be approaching or exceeding the NAAQS in that area;

(ii) Areas that are not required to have a monitor in accordance with the monitoring requirements and NO_2 concentrations may be approaching or exceeding the NAAQS; or

(iii) The minimum monitoring requirements for area-wide monitors are not sufficient to meet monitoring objectives.

(c) The Regional Administrator and the responsible State or local air monitoring agency should work together to design and/or maintain the most appropriate NO_2 network to address the data needs for an area, and include all monitors under this provision in the annual monitoring network plan.

4.3.5 NO_2 Monitoring Spatial Scales

(a) The most important spatial scale for near-road NO_2 monitoring stations to effectively characterize the maximum expected hourly NO_2 concentration due to mobile source emissions on major roadways is the microscale. The most important spatial scales for other monitoring stations characterizing maximum expected hourly NO_2 concentrations are the microscale and middle scale. The most important spatial scale for area-wide monitoring of high NO_2 concentrations is the neighborhood scale.

(1) Microscale--This scale represents areas in close proximity to major roadways or point and area sources. Emissions from roadways result in high ground level NO_2 concentrations at the microscale, where concentration gradients generally exhibit a marked decrease with increasing downwind distance from major roads. As noted in appendix E of this part, near-road NO_2 monitoring stations are required to be within 50 meters of target road segments in order to measure expected peak concentrations. Emissions from stationary point and area sources, and non-road sources may, under certain plume conditions, result in high ground level concentrations at the microscale. The microscale typically represents an area impacted by the plume with dimensions extending up to approximately 100 meters.

(2) Middle scale--This scale generally represents air quality levels in areas up to several city blocks in size with dimensions on the order of approximately 100 meters to 500 meters. The middle scale may include locations of expected maximum hourly concentrations due to proximity to major NO_2 point, area, and/or non-road sources.

(3) Neighborhood scale--The neighborhood scale represents air quality conditions throughout some relatively uniform land use areas with dimensions in the 0.5 to 4.0 kilometer range. Emissions from stationary point and area sources may, under certain plume conditions, result in high NO_2 concentrations at the neighborhood scale. Where a neighborhood site is located away from immediate NO_2 sources, the site may be useful in representing typical air quality values for a larger residential area, and therefore suitable for population exposure and trends analyses.

(4) Urban scale--Measurements in this scale would be used to estimate concentrations over large portions of an urban area with dimensions from 4 to 50 kilometers. Such measurements would be useful for assessing trends in area-wide air quality, and hence, the effectiveness of large scale air pollution control strategies. Urban scale sites may also support other monitoring objectives of the NO_2 monitoring network identified in paragraph 4.3.4 above.

4.3.6 NO_y Monitoring

(a) NO/NO_y measurements are included within the NCore multi-pollutant site requirements and the PAMS program. These NO/NO_y measurements will produce conservative estimates for NO_2 that can be used to ensure tracking continued compliance with the NO_2 NAAQS. NO/NO_y monitors are used at these sites because it is important to collect data on total reactive nitrogen species for understanding O_3 photochemistry.

4.4 Sulfur Dioxide (SO_2) Design Criteria.

4.4.1 General Requirements. (a) State and, where appropriate, local agencies must operate a minimum number of required SO_2 monitoring sites as described below.

4.4.2 Requirement for Monitoring by the Population Weighted Emissions Index. (a) The population weighted emissions index (PWEI) shall be calculated by States for each core based statistical area (CBSA) they contain or share with another State or States for use in the implementation of or adjustment to the SO_2 monitoring network. The PWEI shall be calculated by multiplying the population of each CBSA, using the most current census data or estimates, and the total amount of SO_2 in tons per year emitted within the CBSA area, using an aggregate of the most recent county level emissions data available in the National Emissions Inventory for each county in each CBSA. The resulting product shall be divided by one million, providing a PWEI value, the units of which are million persons-tons per year. For any CBSA with a calculated PWEI value equal to or greater than 1,000,000, a minimum of three SO_2 monitors are required within that CBSA. For

any CBSA with a calculated PWEI value equal to or greater than 100,000, but less than 1,000,000, a minimum of two SO_2 monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 5,000, but less than 100,000, a minimum of one SO_2 monitor is required within that CBSA.

(1) The SO_2 monitoring site(s) required as a result of the calculated PWEI in each CBSA shall satisfy minimum monitoring requirements if the monitor is sited within the boundaries of the parent CBSA and is one of the following site types (as defined in section 1.1.1 of this appendix): population exposure, highest concentration, source impacts, general background, or regional transport. SO_2 monitors at NCore stations may satisfy minimum monitoring requirements if that monitor is located within a CBSA with minimally required monitors under this part. Any monitor that is sited outside of a CBSA with minimum monitoring requirements to assess the highest concentration resulting from the impact of significant sources or source categories existing within that CBSA shall be allowed to count towards minimum monitoring requirements for that CBSA.

4.4.3 Regional Administrator Required Monitoring. (a) The Regional Administrator may require additional SO_2 monitoring stations above the minimum number of monitors required in 4.4.2 of this part, where the minimum monitoring requirements are not sufficient to meet monitoring objectives. The Regional Administrator may require, at his/her discretion, additional monitors in situations where an area has the potential to have concentrations that may violate or contribute to the violation of the NAAQS, in areas impacted by sources which are not conducive to modeling, or in locations with susceptible and vulnerable populations, which are not monitored under the minimum monitoring provisions described above. The Regional Administrator and the responsible State or local air monitoring agency shall work together to design and/or maintain the most appropriate SO_2 network to provide sufficient data to meet monitoring objectives.

4.4.4 SO_2 Monitoring Spatial Scales. (a) The appropriate spatial scales for SO_2 SLAMS monitors are the microscale, middle, neighborhood, and urban scales. Monitors sited at the microscale, middle, and neighborhood scales are suitable for determining maximum hourly concentrations for SO_2. Monitors sited at urban scales are useful for identifying SO_2 transport, trends, and, if sited upwind of local sources, background concentrations.

(1) Microscale--This scale would typify areas in close proximity to SO_2 point and area sources. Emissions from stationary point and area sources, and non-road sources may, under certain plume conditions, result in high ground level

concentrations at the microscale. The microscale typically represents an area impacted by the plume with dimensions extending up to approximately 100 meters.

(2) Middle scale--This scale generally represents air quality levels in areas up to several city blocks in size with dimensions on the order of approximately 100 meters to 500 meters. The middle scale may include locations of expected maximum short-term concentrations due to proximity to major SO_2 point, area, and/or non-road sources.

(3) Neighborhood scale--The neighborhood scale would characterize air quality conditions throughout some relatively uniform land use areas with dimensions in the 0.5 to 4.0 kilometer range. Emissions from stationary point and area sources may, under certain plume conditions, result in high SO_2 concentrations at the neighborhood scale. Where a neighborhood site is located away from immediate SO_2 sources, the site may be useful in representing typical air quality values for a larger residential area, and therefore suitable for population exposure and trends analyses.

(4) Urban scale--Measurements in this scale would be used to estimate concentrations over large portions of an urban area with dimensions from 4 to 50 kilometers. Such measurements would be useful for assessing trends in area-wide air quality, and hence, the effectiveness of large scale air pollution control strategies. Urban scale sites may also support other monitoring objectives of the SO_2 monitoring network such as identifying trends, and when monitors are sited upwind of local sources, background concentrations.

4.4.5 NCore Monitoring. (a) SO_2 measurements are included within the NCore multipollutant site requirements as described in paragraph (3)(b) of this appendix. NCore-based SO_2 measurements are primarily used to characterize SO_2 trends and assist in understanding SO_2 transport across representative areas in urban or rural locations and are also used for comparison with the SO_2 NAAQS. SO_2 monitors at NCore sites that exist in CBSAs with minimum monitoring requirements per section 4.4.2 above shall be allowed to count towards those minimum monitoring requirements.

4.5 Lead (Pb) Design Criteria. (a) State and, where appropriate, local agencies are required to conduct ambient air Pb monitoring near Pb sources which are expected to or have been shown to contribute to a maximum Pb concentration in ambient air in excess of the NAAQS, taking into account the logistics and potential for population exposure. At a minimum, there must be one source-oriented SLAMS site located to measure the maximum Pb concentration in ambient air resulting

from each non-airport Pb source which emits 0.50 or more tons per year and from each airport which emits 1.0 or more tons per year based on either the most recent National Emission Inventory (http://www.epa.gov/ttn/chief/eiinformation.html) or other scientifically justifiable methods and data (such as improved emissions factors or site-specific data) taking into account logistics and the potential for population exposure.

(i) One monitor may be used to meet the requirement in paragraph 4.5(a) for all sources involved when the location of the maximum Pb concentration due to one Pb source is expected to also be impacted by Pb emissions from a nearby source (or multiple sources). This monitor must be sited, taking into account logistics and the potential for population exposure, where the Pb concentration from all sources combined is expected to be at its maximum.

(ii) The Regional Administrator may waive the requirement in paragraph 4.5(a) for monitoring near Pb sources if the State or, where appropriate, local agency can demonstrate the Pb source will not contribute to a maximum Pb concentration in ambient air in excess of 50 percent of the NAAQS (based on historical monitoring data, modeling, or other means). The waiver must be renewed once every 5 years as part of the network assessment required under § 58.10(d).

(iii) State and, where appropriate, local agencies are required to conduct ambient air Pb monitoring near each of the airports listed in Table D–3A for a period of 12 consecutive months commencing no later than December 27, 2011. Monitors shall be sited to measure the maximum Pb concentration in ambient air, taking into account logistics and the potential for population exposure, and shall use an approved Pb–TSP Federal Reference Method or Federal Equivalent Method. Any monitor that exceeds 50 percent of the Pb NAAQS on a rolling 3–month average (as determined according to 40 CFR part 50, Appendix R) shall become a required monitor under paragraph 4.5(c) of this Appendix, and shall continue to monitor for Pb unless a waiver is granted allowing it to stop operating as allowed by the provisions in paragraph 4.5(a)(ii) of this appendix. Data collected shall be submitted to the Air Quality System database according to the requirements of 40 CFR part 58.16.

Table D-3A Airports To Be Monitored for Lead

Airport	County	State
Merrill Field	Anchorage	AK
Pryor Field Regional	Limestone	AL
Palo Alto Airport of Santa Clara County	Santa Clara	CA
McClellan-Palomar	San Diego	CA
Reid-Hillview	Santa Clara	CA
Gillespie Field	San Diego	CA
San Carlos	San Mateo	CA
Nantucket Memorial	Nantucket	MA
Oakland County International	Oakland	MI
Republic	Suffolk	NY
Brookhaven	Suffolk	NY
Stinson Municipal	Bexar	TX
Northwest Regional	Denton	TX
Harvey Field	Snohomish	WA
Auburn Municipal	King	WA

(b) State and, where appropriate, local agencies are required to conduct non-source-oriented Pb monitoring at each NCore site required under paragraph 3 of this appendix in a CBSA with a population of 500,000 or more.

(c) The EPA Regional Administrator may require additional monitoring beyond the minimum monitoring requirements contained in paragraphs 4.5(a) and 4.5(b) where the likelihood of Pb air quality violations is significant or where the emissions density, topography, or population locations are complex and varied. EPA Regional Administrators may require additional monitoring at locations including, but not limited to, those near existing additional industrial sources of Pb, recently closed industrial sources of Pb, airports where piston-engine aircraft emit Pb, and other sources of re-entrained Pb dust.

(d) The most important spatial scales for source-oriented sites to effectively characterize the emissions from point sources are microscale and middle scale. The most important spatial scale for non-source-oriented sites to characterize typical lead concentrations in urban areas is the neighborhood scale. Monitor siting should be conducted in accordance with 4.5(a)(i) with respect to source-oriented sites.

(1) Microscale--This scale would typify areas in close proximity to lead point sources. Emissions from point sources such as primary and secondary lead smelters, and primary copper smelters may under fumigation conditions likewise result in high ground level concentrations at the microscale. In the latter case, the microscale would represent an area impacted by the plume with dimensions extending up to approximately 100 meters. Pb monitors in areas where the public has access, and particularly children have access, are desirable because of the higher sensitivity of children to exposures of elevated Pb concentrations.

(2) Middle scale--This scale generally represents Pb air quality levels in areas up to several city blocks in size with dimensions on the order of approximately 100 meters to 500 meters. The middle scale may for example, include schools and playgrounds in center city areas which are close to major Pb point sources. Pb monitors in such areas are desirable because of the higher sensitivity of children to exposures of elevated Pb concentrations (reference 3 of this appendix). Emissions from point sources frequently impact on areas at which single sites may be located to measure concentrations representing middle spatial scales.

(3) Neighborhood scale--The neighborhood scale would characterize air quality conditions throughout some relatively uniform land use areas with dimensions in the 0.5 to 4.0 kilometer range. Sites of this scale would provide monitoring data in areas representing conditions where children live and play. Monitoring in such areas is important since this segment of the population is more susceptible to the effects of Pb. Where a neighborhood site is located away from immediate Pb sources, the site may be very useful in representing typical air quality values for a larger residential area, and therefore suitable for population exposure and trends analyses.

(d) Technical guidance is found in references 4 and 5 of this appendix. These documents provide additional guidance on locating sites to meet specific urban area monitoring objectives and should be used in locating new sites or evaluating the adequacy of existing sites.

4.6 Particulate Matter (PM_{10}) Design Criteria.

(a) Table D–4 indicates the approximate number of permanent stations required in MSAs to characterize national and regional PM_{10} air quality trends and geographical patterns. The number of PM_{10} stations in areas where MSA populations exceed 1,000,000 must be in the range from 2 to 10 stations, while in low population urban areas, no more than two stations are required. A range of monitoring stations is specified in Table D–4 because sources of pollutants and local control efforts can vary from one part of the country to another and therefore, some flexibility is allowed in selecting the actual number of stations in any one locale. Modifications from these PM_{10} monitoring requirements must be approved by the Regional Administrator.

Table D–4 of Appendix D to Part 58. PM_{10} Minimum Monitoring Requirements (Approximate Number of Stations Per MSA)[1]

Population category	High concentration[2]	Medium concentration[3]	Low concentration[4,5]
>1,000,000	6-10	4-8	2-4
500,000–1,000,000	4-8	2-4	1-2
250,000–500,000	3-4	1-2	0-1
100,000–250,000	1-2	0-1	0

(b) Although microscale monitoring may be appropriate in some circumstances, the most important spatial scales to effectively characterize the emissions of PM_{10} from both mobile and stationary sources are the middle scales and neighborhood scales.

(1) Microscale--This scale would typify areas such as downtown street canyons, traffic corridors, and fence line stationary source monitoring locations where the general public could be exposed to maximum PM_{10} concentrations. Microscale particulate matter sites should be located near inhabited buildings or locations where the general public can be expected to be exposed to the concentration measured. Emissions from stationary sources such as primary and secondary smelters, power plants, and other large industrial processes may, under certain plume conditions, likewise result in high ground level concentrations at the microscale. In the latter case, the microscale would represent an area impacted by the plume with dimensions extending up to approximately 100 meters. Data

collected at microscale sites provide information for evaluating and developing hot spot control measures.

(2) Middle scale--Much of the short-term public exposure to coarse fraction particles (PM_{10}) is on this scale and on the neighborhood scale. People moving through downtown areas or living near major roadways or stationary sources, may encounter particulate pollution that would be adequately characterized by measurements of this spatial scale. Middle scale PM_{10} measurements can be appropriate for the evaluation of possible short-term exposure public health effects. In many situations, monitoring sites that are representative of micro-scale or middle-scale impacts are not unique and are representative of many similar situations. This can occur along traffic corridors or other locations in a residential district. In this case, one location is representative of a neighborhood of small scale sites and is appropriate for evaluation of long-term or chronic effects. This scale also includes the characteristic concentrations for other areas with dimensions of a few hundred meters such as the parking lot and feeder streets associated with shopping centers, stadia, and office buildings. In the case of PM_{10}, unpaved or seldomly swept parking lots associated with these sources could be an important source in addition to the vehicular emissions themselves.

(3) Neighborhood scale--Measurements in this category represent conditions throughout some reasonably homogeneous urban sub-region with dimensions of a few kilometers and of generally more regular shape than the middle scale. Homogeneity refers to the particulate matter concentrations, as well as the land use and land surface characteristics. In some cases, a location carefully chosen to provide neighborhood scale data would represent not only the immediate neighborhood but also neighborhoods of the same type in other parts of the city. Neighborhood scale PM_{10} sites provide information about trends and compliance with standards because they often represent conditions in areas where people commonly live and work for extended periods. Neighborhood scale data could provide valuable information for developing, testing, and revising models that describe the larger-scale concentration patterns, especially those models relying on spatially smoothed emission fields for inputs. The neighborhood scale measurements could also be used for neighborhood comparisons within or between cities.

4.7 Fine Particulate Matter ($PM_{2.5}$) Design Criteria.

4.7.1 General Requirements. (a) State, and where applicable local, agencies must operate the minimum number of required $PM_{2.5}$ SLAMS sites listed in Table D–5 of this appendix. The NCore sites are expected to complement the $PM_{2.5}$ data

collection that takes place at non–NCore SLAMS sites, and both types of sites can be used to meet the minimum $PM_{2.5}$ network requirements. Deviations from these $PM_{2.5}$ monitoring requirements must be approved by the EPA Regional Administrator.

Table D-5 of Appendix D to Part 58. $PM_{2.5}$ Minimum Monitoring Requirements

MSA population[1,2]	Most recent 3-year design value ⩾85% of any $PM_{2.5}$ NAAQS[3]	Most recent 3-year design value <85% of any $PM_{2.5}$ NAAQS[3,4]
>1,000,000	3	2
500,000–1,000,000	2	1
50,000–<500,000[5]	1	0

(b) Specific Design Criteria for $PM_{2.5}$. The required monitoring stations or sites must be sited to represent area-wide air quality. These sites can include sites collocated at PAMS. These monitoring stations will typically be at neighborhood or urban-scale; however, micro-or middle-scale $PM_{2.5}$ monitoring sites that represent many such locations throughout a metropolitan area are considered to represent area-wide air quality.

(1) At least one monitoring station is to be sited at neighborhood or larger scale in an area of expected maximum concentration.

(2) For CBSAs with a population of 1,000,000 or more persons, at least one $PM_{2.5}$ monitor is to be collocated at a near-road NO_2 station required in section 4.3.2(a) of this appendix.

(3) For areas with additional required SLAMS, a monitoring station is to be sited in an area of poor air quality.

(4) Additional technical guidance for siting $PM_{2.5}$ monitors is provided in references 6 and 7 of this appendix.

(c) The most important spatial scale to effectively characterize the emissions of particulate matter from both mobile and stationary sources is the neighborhood scale for $PM_{2.5}$. For purposes of establishing monitoring sites to represent large homogenous areas other than the above scales of representativeness and to characterize regional transport, urban or regional scale sites would also be needed. Most $PM_{2.5}$ monitoring in urban areas should be representative of a neighborhood scale.

(1) Micro-scale. This scale would typify areas such as downtown street canyons and traffic corridors where the general public would be exposed to maximum concentrations from mobile sources. In some circumstances, the micro-scale is appropriate for particulate sites. SLAMS sites measured at the micro-scale level should, however, be limited to urban sites that are representative of long-term human exposure and of many such microenvironments in the area. In general, micro-scale particulate matter sites should be located near inhabited buildings or locations where the general public can be expected to be exposed to the concentration measured. Emissions from stationary sources such as primary and secondary smelters, power plants, and other large industrial processes may, under certain plume conditions, likewise result in high ground level concentrations at the micro-scale. In the latter case, the micro-scale would represent an area impacted by the plume with dimensions extending up to approximately 100 meters. Data collected at micro-scale sites provide information for evaluating and developing hot spot control measures.

(2) Middle scale--People moving through downtown areas, or living near major roadways, encounter particle concentrations that would be adequately characterized by this spatial scale. Thus, measurements of this type would be appropriate for the evaluation of possible short-term exposure public health effects of particulate matter pollution. In many situations, monitoring sites that are representative of microscale or middle-scale impacts are not unique and are representative of many similar situations. This can occur along traffic corridors or other locations in a residential district. In this case, one location is representative of a number of small scale sites and is appropriate for evaluation of long-term or chronic effects. This scale also includes the characteristic concentrations for other areas with dimensions of a few hundred meters such as the parking lot and feeder streets associated with shopping centers, stadia, and office buildings.

(3) Neighborhood scale--Measurements in this category would represent conditions throughout some reasonably homogeneous urban sub-region with dimensions of a few kilometers and of generally more regular shape than the middle scale. Homogeneity refers to the particulate matter concentrations, as well

as the land use and land surface characteristics. Much of the $PM_{2.5}$ exposures are expected to be associated with this scale of measurement. In some cases, a location carefully chosen to provide neighborhood scale data would represent the immediate neighborhood as well as neighborhoods of the same type in other parts of the city. $PM_{2.5}$ sites of this kind provide good information about trends and compliance with standards because they often represent conditions in areas where people commonly live and work for periods comparable to those specified in the NAAQS. In general, most $PM_{2.5}$ monitoring in urban areas should have this scale.

(4) Urban scale--This class of measurement would be used to characterize the particulate matter concentration over an entire metropolitan or rural area ranging in size from 4 to 50 kilometers. Such measurements would be useful for assessing trends in area-wide air quality, and hence, the effectiveness of large scale air pollution control strategies. Community-oriented $PM_{2.5}$ sites may have this scale.

(5) Regional scale--These measurements would characterize conditions over areas with dimensions of as much as hundreds of kilometers. As noted earlier, using representative conditions for an area implies some degree of homogeneity in that area. For this reason, regional scale measurements would be most applicable to sparsely populated areas. Data characteristics of this scale would provide information about larger scale processes of particulate matter emissions, losses and transport. $PM_{2.5}$ transport contributes to elevated particulate concentrations and may affect multiple urban and State entities with large populations such as in the eastern United States. Development of effective pollution control strategies requires an understanding at regional geographical scales of the emission sources and atmospheric processes that are responsible for elevated $PM_{2.5}$ levels and may also be associated with elevated O_3 and regional haze.

4.7.2 Requirement for Continuous $PM_{2.5}$ Monitoring. The State, or where appropriate, local agencies must operate continuous $PM_{2.5}$ analyzers equal to at least one-half (round up) the minimum required sites listed in Table D–5 of this appendix. At least one required continuous analyzer in each MSA must be collocated with one of the required FRM/FEM/ARM monitors, unless at least one of the required FRM/FEM/ARM monitors is itself a continuous FEM or ARM monitor in which case no collocation requirement applies. State and local air monitoring agencies must use methodologies and quality assurance/quality control (QA/QC) procedures approved by the EPA Regional Administrator for these required continuous analyzers.

4.7.3 Requirement for $PM_{2.5}$ Background and Transport Sites. Each State shall install and operate at least one $PM_{2.5}$ site to monitor for regional background and at

least one $PM_{2.5}$ site to monitor regional transport. These monitoring sites may be at community-oriented sites and this requirement may be satisfied by a corresponding monitor in an area having similar air quality in another State. State and local air monitoring agencies must use methodologies and QA/QC procedures approved by the EPA Regional Administrator for these sites. Methods used at these sites may include non-federal reference method samplers such as IMPROVE or continuous $PM_{2.5}$ monitors.

4.7.4 $PM_{2.5}$ Chemical Speciation Site Requirements. Each State shall continue to conduct chemical speciation monitoring and analyses at sites designated to be part of the $PM_{2.5}$ Speciation Trends Network (STN). The selection and modification of these STN sites must be approved by the Administrator. The $PM_{2.5}$ chemical speciation urban trends sites shall include analysis for elements, selected anions and cations, and carbon. Samples must be collected using the monitoring methods and the sampling schedules approved by the Administrator. Chemical speciation is encouraged at additional sites where the chemically resolved data would be useful in developing State implementation plans and supporting atmospheric or health effects related studies.

4.8 Coarse Particulate Matter ($PM_{10–2.5}$) Design Criteria.

4.8.1 General Monitoring Requirements. (a) The only required monitors for $PM_{10–2.5}$ are those required at NCore Stations.

(b) Although microscale monitoring may be appropriate in some circumstances, middle and neighborhood scale measurements are the most important station classifications for $PM_{10–2.5}$ to assess the variation in coarse particle concentrations that would be expected across populated areas that are in proximity to large emissions sources.

(1) Microscale--This scale would typify relatively small areas immediately adjacent to: Industrial sources; locations experiencing ongoing construction, redevelopment, and soil disturbance; and heavily traveled roadways. Data collected at microscale stations would characterize exposure over areas of limited spatial extent and population exposure, and may provide information useful for evaluating and developing source-oriented control measures.

(2) Middle scale--People living or working near major roadways or industrial districts encounter particle concentrations that would be adequately characterized by this spatial scale. Thus, measurements of this type would be appropriate for the evaluation of public health effects of coarse particle exposure. Monitors located in

populated areas that are nearly adjacent to large industrial point sources of coarse particles provide suitable locations for assessing maximum population exposure levels and identifying areas of potentially poor air quality. Similarly, monitors located in populated areas that border dense networks of heavily-traveled traffic are appropriate for assessing the impacts of resuspended road dust. This scale also includes the characteristic concentrations for other areas with dimensions of a few hundred meters such as school grounds and parks that are nearly adjacent to major roadways and industrial point sources, locations exhibiting mixed residential and commercial development, and downtown areas featuring office buildings, shopping centers, and stadiums.

(3) Neighborhood scale--Measurements in this category would represent conditions throughout some reasonably homogeneous urban sub-region with dimensions of a few kilometers and of generally more regular shape than the middle scale. Homogeneity refers to the particulate matter concentrations, as well as the land use and land surface characteristics. This category includes suburban neighborhoods dominated by residences that are somewhat distant from major roadways and industrial districts but still impacted by urban sources, and areas of diverse land use where residences are interspersed with commercial and industrial neighborhoods. In some cases, a location carefully chosen to provide neighborhood scale data would represent the immediate neighborhood as well as neighborhoods of the same type in other parts of the city. The comparison of data from middle scale and neighborhood scale sites would provide valuable information for determining the variation of $PM_{10-2.5}$ levels across urban areas and assessing the spatial extent of elevated concentrations caused by major industrial point sources and heavily traveled roadways. Neighborhood scale sites would provide concentration data that are relevant to informing a large segment of the population of their exposure levels on a given day.

4.8.2 [Reserved]

5. Network Design for Photochemical Assessment Monitoring Stations (PAMS)

The PAMS program provides more comprehensive data on O_3 air pollution in areas classified as serious, severe, or extreme nonattainment for O_3 than would otherwise be achieved through the NCore and SLAMS sites. More specifically, the PAMS program includes measurements for O_3, oxides of nitrogen, VOC, and meteorology.

5.1 PAMS Monitoring Objectives. PAMS design criteria are site specific. Concurrent measurements of O_3, oxides of nitrogen, speciated VOC, CO, and

meteorology are obtained at PAMS sites. Design criteria for the PAMS network are based on locations relative to O_3 precursor source areas and predominant wind directions associated with high O_3 events. Specific monitoring objectives are associated with each location. The overall design should enable characterization of precursor emission sources within the area, transport of O_3 and its precursors, and the photochemical processes related to O_3 nonattainment. Specific objectives that must be addressed include assessing ambient trends in O_3, oxides of nitrogen, VOC species, and determining spatial and diurnal variability of O_3, oxides of nitrogen, and VOC species. Specific monitoring objectives associated with each of these sites may result in four distinct site types. Detailed guidance for the locating of these sites may be found in reference 9 of this appendix.

(a) Type 1 sites are established to characterize upwind background and transported O_3 and its precursor concentrations entering the area and will identify those areas which are subjected to transport.

(b) Type 2 sites are established to monitor the magnitude and type of precursor emissions in the area where maximum precursor emissions are expected to impact and are suited for the monitoring of urban air toxic pollutants.

(c) Type 3 sites are intended to monitor maximum O_3 concentrations occurring downwind from the area of maximum precursor emissions.

(d) Type 4 sites are established to characterize the downwind transported O_3 and its precursor concentrations exiting the area and will identify those areas which are potentially contributing to overwhelming transport in other areas.

5.2 Monitoring Period. PAMS precursor monitoring must be conducted annually throughout the months of June, July and August (as a minimum) when peak O_3 values are expected in each area. Alternate precursor monitoring periods may be submitted for approval to the Administrator as a part of the annual monitoring network plan required by § 58.10.

5.3 Minimum Monitoring Network Requirements. A Type 2 site is required for each area. Overall, only two sites are required for each area, providing all chemical measurements are made. For example, if a design includes two Type 2 sites, then a third site will be necessary to capture the NO_y measurement. The minimum required number and type of monitoring sites and sampling requirements are listed in Table D–6 of this appendix. Any alternative plans may be put in place in lieu of these requirements, if approved by the Administrator.

Table D-6 of Appendix D to Part 58. Minimum Required PAMS Monitoring Locations and Frequencies

Measurement	Where required	Sampling frequency (all daily except for upper air meteorology)[1]
Speciated VOC[2]	Two sites per area, one of which must be a Type 2 site	During the PAMS monitoring period: (1) Hourly auto GC, or (2) Eight 3-hour canisters, or (3) 1 morning and 1 afternoon canister with a 3-hour or less averaging time plus Continuous Total Non-methane Hydrocarbon measurement.
Carbonyl sampling	Type 2 site in areas classified as serious or above for the 8-hour ozone standard	3-hour samples every day during the PAMS monitoring period.
NO_x	All Type 2 sites	Hourly during the ozone monitoring season.[3]
NO_y	One site per area at the Type 3 or Type 1 site	Hourly during the ozone monitoring season.
CO (ppb level)	One site per area at a Type 2 site	Hourly during the ozone monitoring season.
Ozone	All sites	Hourly during the ozone monitoring season.
Surface met	All sites	Hourly during the ozone monitoring season.
Upper air meteorology	One representative location within PAMS area	Sampling frequency must be approved as part of the annual monitoring network plan required in 40 CFR 58.10.

5.4 Transition Period. A transition period is allowed for phasing in the operation of newly required PAMS programs (due generally to reclassification of an area into serious, severe, or extreme nonattainment for ozone). Following the date of redesignation or reclassification of any existing O_3 nonattainment area to serious, severe, or extreme, or the designation of a new area and classification to serious,

severe, or extreme O_3 nonattainment, a State is allowed 1 year to develop plans for its PAMS implementation strategy. Subsequently, a minimum of one Type 2 site must be operating by the first month of the following approved PAMS season. Operation of the remaining site(s) must, at a minimum, be phased in at the rate of one site per year during subsequent years as outlined in the approved PAMS network description provided by the State.

6. References

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Footnotes

1 Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

2 Population based on latest available census figures.

3 The ozone (O_3) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

4 These minimum monitoring requirements apply in the absence of a design value.

5 Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

1 Selection of urban areas and actual numbers of stations per area will be jointly determined by EPA and the State agency.

2 High concentration areas are those for which ambient PM10 data show ambient concentrations exceeding the PM_{10} NAAQS by 20 percent or more.

3 Medium concentration areas are those for which ambient PM10 data show ambient concentrations exceeding 80 percent of the PM_{10} NAAQS.

4 Low concentration areas are those for which ambient PM10 data show ambient concentrations less than 80 percent of the PM_{10} NAAQS.

5 These minimum monitoring requirements apply in the absence of a design value.

1 Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

2 Population based on latest available census figures.

3 The $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

4 These minimum monitoring requirements apply in the absence of a design value.

5 Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

1 Daily or with an approved alternative plan.

2 Speciated VOC is defined in the "Technical Assistance Document for Sampling and Analysis of Ozone Precursors", EPA/600-R-98/161, September 1998.

3 Approved ozone monitoring season as stipulated in Table D-3 of this appendix.

40 C.F.R. § 58 App. E

APPENDIX E TO PART 58--PROBE AND MONITORING PATH SITING CRITERIA FOR AMBIENT AIR QUALITY MONITORING

1. Introduction

(a) This appendix contains specific location criteria applicable to SLAMS, NCore, and PAMS ambient air quality monitoring probes, inlets, and optical paths after the general location has been selected based on the monitoring objectives and spatial scale of representation discussed in appendix D to this part. Adherence to these siting criteria is necessary to ensure the uniform collection of compatible and comparable air quality data.

(b) The probe and monitoring path siting criteria discussed in this appendix must be followed to the maximum extent possible. It is recognized that there may be situations where some deviation from the siting criteria may be necessary. In any such case, the reasons must be thoroughly documented in a written request for a waiver that describes how and why the proposed siting deviates from the criteria. This documentation should help to avoid later questions about the validity of the

resulting monitoring data. Conditions under which the EPA would consider an application for waiver from these siting criteria are discussed in section 10 of this appendix.

(c) The pollutant-specific probe and monitoring path siting criteria generally apply to all spatial scales except where noted otherwise. Specific siting criteria that are phrased with a "must" are defined as requirements and exceptions must be approved through the waiver provisions. However, siting criteria that are phrased with a "should" are defined as goals to meet for consistency but are not requirements.

The probe or at least 80 percent of the monitoring path must be located between 2 and 15 meters above ground level for all O_3 and SO_2 monitoring sites, and for neighborhood or larger spatial scale Pb, PM_{10}, $PM_{10-2.5}$, $PM_{2.5}$, NO_2, and CO sites. Middle scale $PM_{10-2.5}$ sites are required to have sampler inlets between 2 and 7 meters above ground level. Microscale Pb, PM_{10}, $PM_{10-2.5}$, and $PM_{2.5}$ sites are required to have sampler inlets between 2 and 7 meters above ground level. Microscale near-road NO_2 monitoring sites are required to have sampler inlets between 2 and 7 meters above ground level. The inlet probes for microscale carbon monoxide monitors that are being used to measure concentrations near roadways must be between 2 and 7 meters above ground level. Those inlet probes for microscale carbon monoxide monitors measuring concentrations near roadways in downtown areas or urban street canyons must be between 2.5 and 3.5 meters above ground level. The probe or at least 90 percent of the monitoring path must be at least 1 meter vertically or horizontally away from any supporting structure, walls, parapets, penthouses, etc., and away from dusty or dirty areas. If the probe or a significant portion of the monitoring path is located near the side of a building or wall, then it should be located on the windward side of the building relative to the prevailing wind direction during the season of highest concentration potential for the pollutant being measured.

3. Spacing From Minor Sources

(a) It is important to understand the monitoring objective for a particular location in order to interpret this particular requirement. Local minor sources of a primary pollutant, such as SO_2, lead, or particles, can cause high concentrations of that particular pollutant at a monitoring site. If the objective for that monitoring site is to investigate these local primary pollutant emissions, then the site is likely to be properly located nearby. This type of monitoring site would in all likelihood be a microscale type of monitoring site. If a monitoring site is to be used to determine air quality over a much larger area, such as a neighborhood or city, a monitoring

agency should avoid placing a monitor probe, path, or inlet near local, minor sources. The plume from the local minor sources should not be allowed to inappropriately impact the air quality data collected at a site. Particulate matter sites should not be located in an unpaved area unless there is vegetative ground cover year round, so that the impact of wind blown dusts will be kept to a minimum.

(b) Similarly, local sources of nitric oxide (NO) and ozone-reactive hydrocarbons can have a scavenging effect causing unrepresentatively low concentrations of O_3 in the vicinity of probes and monitoring paths for O_3. To minimize these potential interferences, the probe or at least 90 percent of the monitoring path must be away from furnace or incineration flues or other minor sources of SO_2 or NO. The separation distance should take into account the heights of the flues, type of waste or fuel burned, and the sulfur content of the fuel.

4. Spacing From Obstructions

(a) Buildings and other obstacles may possibly scavenge SO_2, O_3, or NO_2, and can act to restrict airflow for any pollutant. To avoid this interference, the probe, inlet, or at least 90 percent of the monitoring path must have unrestricted airflow and be located away from obstacles. The distance from the obstacle to the probe, inlet, or monitoring path must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path. An exception to this requirement can be made for measurements taken in street canyons or at source-oriented sites where buildings and other structures are unavoidable.

(b) Generally, a probe or monitoring path located near or along a vertical wall is undesirable because air moving along the wall may be subject to possible removal mechanisms. A probe, inlet, or monitoring path must have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential. For particle sampling, a minimum of 2 meters of separation from walls, parapets, and structures is required for rooftop site placement.

(c) Special consideration must be given to the use of open path analyzers due to their inherent potential sensitivity to certain types of interferences, or optical obstructions. A monitoring path must be clear of all trees, brush, buildings, plumes, dust, or other optical obstructions, including potential obstructions that may move due to wind, human activity, growth of vegetation, etc. Temporary optical obstructions, such as rain, particles, fog, or snow, should be considered when siting an open path analyzer. Any of these temporary obstructions that are of sufficient

density to obscure the light beam will affect the ability of the open path analyzer to continuously measure pollutant concentrations. Transient, but significant obscuration of especially longer measurement paths could occur as a result of certain meteorological conditions (e.g., heavy fog, rain, snow) and/or aerosol levels that are of a sufficient density to prevent the open path analyzer's light transmission. If certain compensating measures are not otherwise implemented at the onset of monitoring (e.g., shorter path lengths, higher light source intensity), data recovery during periods of greatest primary pollutant potential could be compromised. For instance, if heavy fog or high particulate levels are coincident with periods of projected NAAQS–threatening pollutant potential, the representativeness of the resulting data record in reflecting maximum pollutant concentrations may be substantially impaired despite the fact that the site may otherwise exhibit an acceptable, even exceedingly high overall valid data capture rate.

(d) For near-road NO_2 monitoring stations, the monitor probe shall have an unobstructed air flow, where no obstacles exist at or above the height of the monitor probe, between the monitor probe and the outside nearest edge of the traffic lanes of the target road segment.

5. Spacing From Trees

(a) Trees can provide surfaces for SO_2, O_3, or NO_2 adsorption or reactions, and surfaces for particle deposition. Trees can also act as obstructions in cases where they are located between the air pollutant sources or source areas and the monitoring site, and where the trees are of a sufficient height and leaf canopy density to interfere with the normal airflow around the probe, inlet, or monitoring path. To reduce this possible interference/obstruction, the probe, inlet, or at least 90 percent of the monitoring path must be at least 10 meters or further from the drip line of trees.

(b) The scavenging effect of trees is greater for O_3 than for other criteria pollutants. Monitoring agencies must take steps to consider the impact of trees on ozone monitoring sites and take steps to avoid this problem.

(c) For microscale sites of any air pollutant, no trees or shrubs should be located between the probe and the source under investigation, such as a roadway or a stationary source.

6. Spacing From Roadways

Table E-1 to Appendix E of Part 58--Minimum Separation Distance Between Roadways and Probes or Monitoring Paths for Monitoring Neighborhood and Urban Scale Ozone ($O_{3)}$ and Oxides of Nitrogen (NO, NO_2, NO_X, $NO_{y)}$

Roadway average daily traffic, vehicles per day	Minimum distance[1] (meters)	Minimum distance[12] (meters)
≤ 1,000	10	10
10,000	10	20
15,000	20	30
20,000	30	40
40,000	50	60
70,000	100	100
≥ 110,000	250	250

6.1 Spacing for Ozone Probes and Monitoring Paths

In siting an O_3 analyzer, it is important to minimize destructive interferences form sources of NO, since NO readily reacts with O_3. Table E–1 of this appendix provides the required minimum separation distances between a roadway and a probe or, where applicable, at least 90 percent of a monitoring path for various ranges of daily roadway traffic. A sampling site having a point analyzer probe located closer to a roadway than allowed by the Table E–1 requirements should be classified as microscale or middle scale, rather than neighborhood or urban scale, since the measurements from such a site would more closely represent the middle scale. If an open path analyzer is used at a site, the monitoring path(s) must not cross over a roadway with an average daily traffic count of 10,000 vehicles per day or more. For those situations where a monitoring path crosses a roadway with fewer than 10,000 vehicles per day, monitoring agencies must consider the entire segment of the monitoring path in the area of potential atmospheric interference from automobile emissions. Therefore, this calculation must include the length of the monitoring path over the roadway plus any segments of the monitoring path that lie in the area between the roadway and minimum separation distance, as

determined from the Table E–1 of this appendix. The sum of these distances must not be greater than 10 percent of the total monitoring path length.

6.2 Spacing for Carbon Monoxide Probes and Monitoring Paths. (a) Near-road microscale CO monitoring sites, including those located in downtown areas, urban street canyons, and other near-road locations such as those adjacent to highly trafficked roads, are intended to provide a measurement of the influence of the immediate source on the pollution exposure on the adjacent area.

(b) Microscale CO monitor inlets probes in downtown areas or urban street canyon locations shall be located a minimum distance of 2 meters and a maximum distance of 10 meters from the edge of the nearest traffic lane.

(c) Microscale CO monitor inlet probes in downtown areas or urban street canyon locations shall be located at least 10 meters from an intersection and preferably at a midblock location. Midblock locations are preferable to intersection locations because intersections represent a much smaller portion of downtown space than do the streets between them. Pedestrian exposure is probably also greater in street canyon/corridors than at intersections.

Table E-2 to Appendix E of Part 58. Minimum Separation Distance Between Roadways and Probes or Monitoring Paths for Monitoring Neighborhood Scale Carbon Monoxide

Roadway average daily traffic, vehicles per day	Minimum distance[1] (meters)
⩽10,000	10
15,000	25
20,000	45
30,000	80
40,000	115
50,000	135
⩾60,000	150

6.3 Spacing for Particulate Matter ($PM_{2.5}$, PM_{10}, Pb) Inlets. (a) Since emissions associated with the operation of motor vehicles contribute to urban area particulate matter ambient levels, spacing from roadway criteria are necessary for ensuring national consistency in PM sampler siting.

(b) The intent is to locate localized hot-spot sites in areas of highest concentrations whether it be from mobile or multiple stationary sources. If the area is primarily affected by mobile sources and the maximum concentration area(s) is judged to be a traffic corridor or street canyon location, then the monitors should be located near roadways with the highest traffic volume and at separation distances most likely to produce the highest concentrations. For the microscale traffic corridor site, the location must be between 5 and 15 meters from the major roadway. For the microscale street canyon site the location must be between 2 and 10 meters from the roadway. For the middle scale site, a range of acceptable distances from the roadway is shown in figure E–1 of this appendix. This figure also includes separation distances between a roadway and neighborhood or larger scale sites by default. Any site, 2 to 15 meters high, and further back than the middle scale requirements will generally be neighborhood, urban or regional scale. For example, according to Figure E–1 of this appendix, if a PM sampler is primarily influenced by roadway emissions and that sampler is set back 10 meters from a 30,000 ADT (average daily traffic) road, the site should be classified as microscale, if the sampler height is between 2 and 7 meters. If the sampler height is between 7 and 15 meters, the site should be classified as middle scale. If the sample is 20 meters from the same road, it will be classified as middle scale; if 40 meters, neighborhood scale; and if 110 meters, an urban scale.

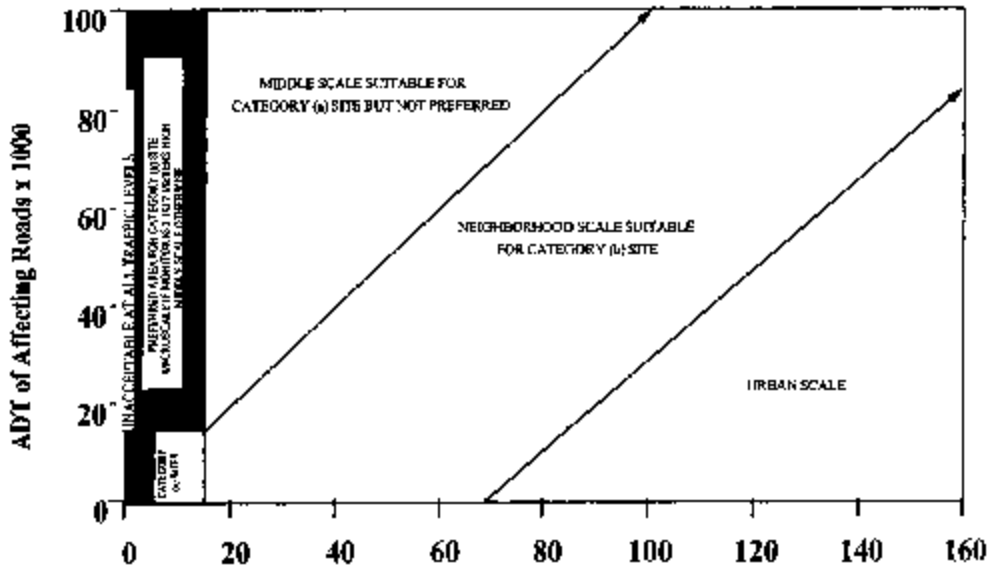

Figure E-1. Distance of PM samplers to nearest traffic lane (meters)

6.4 Spacing for Nitrogen Dioxide (NO_2) Probes and Monitoring Paths

(a) In siting near-road NO_2 monitors as required in paragraph 4.3.2 of appendix D of this part, the monitor probe shall be as near as practicable to the outside nearest edge of the traffic lanes of the target road segment; but shall not be located at a distance greater than 50 meters, in the horizontal, from the outside nearest edge of the traffic lanes of the target road segment.

(b) In siting NO_2 monitors for neighborhood and larger scale monitoring, it is important to minimize near-road influences. Table E–1 of this appendix provides the required minimum separation distances between a roadway and a probe or, where applicable, at least 90 percent of a monitoring path for various ranges of daily roadway traffic. A sampling site having a point analyzer probe located closer to a roadway than allowed by the Table E–1 requirements should be classified as microscale or middle scale rather than neighborhood or urban scale. If an open path analyzer is used at a site, the monitoring path(s) must not cross over a roadway with an average daily traffic count of 10,000 vehicles per day or more. For those situations where a monitoring path crosses a roadway with fewer than 10,000 vehicles per day, monitoring agencies must consider the entire segment of the monitoring path in the area of potential atmospheric interference form automobile emissions. Therefore, this calculation must include the length of the monitoring path over the roadway plus any segments of the monitoring path that lie in the area between the roadway and minimum separation distance, as determined

form the Table E–1 of this appendix. The sum of these distances must not be greater than 10 percent of the total monitoring path length.

7. Cumulative Interferences on a Monitoring Path

(This paragraph applies only to open path analyzers.) The cumulative length or portion of a monitoring path that is affected by minor sources, trees, or roadways must not exceed 10 percent of the total monitoring path length.

8. Maximum Monitoring Path Length

(This paragraph applies only to open path analyzers.) The monitoring path length must not exceed 1 kilometer for analyzers in neighborhood, urban, or regional scale. For middle scale monitoring sites, the monitoring path length must not exceed 300 meters. In areas subject to frequent periods of dust, fog, rain, or snow, consideration should be given to a shortened monitoring path length to minimize loss of monitoring data due to these temporary optical obstructions. For certain ambient air monitoring scenarios using open path analyzers, shorter path lengths may be needed in order to ensure that the monitoring site meets the objectives and spatial scales defined in appendix D to this part. The Regional Administrator may require shorter path lengths, as needed on an individual basis, to ensure that the SLAMS sites meet the appendix D requirements. Likewise, the Administrator may specify the maximum path length used at NCore monitoring sites.

9. Probe Material and Pollutant Sample Residence Time

(a) For the reactive gases, SO_2, NO_2, and O_3, special probe material must be used for point analyzers. Studies [20–24] have been conducted to determine the suitability of materials such as polypropylene, polyethylene, polyvinyl chloride, Tygon®, aluminum, brass, stainless steel, copper, Pyrex® glass and Teflon® for use as intake sampling lines. Of the above materials, only Pyrex® glass and Teflon® have been found to be acceptable for use as intake sampling lines for all the reactive gaseous pollutants. Furthermore, the EPA[25] has specified borosilicate glass or FEP Teflon® as the only acceptable probe materials for delivering test atmospheres in the determination of reference or equivalent methods. Therefore, borosilicate glass, FEP Teflon® or their equivalent must be the only material in the sampling train (from inlet probe to the back of the analyzer) that can be in contact with the ambient air sample for existing and new SLAMs.

(b) For volatile organic compound (VOC) monitoring at PAMS, FEP Teflon® is unacceptable as the probe material because of VOC adsorption and desorption reactions on the FEP Teflon®. Borosilicate glass, stainless steel, or its equivalent

are the acceptable probe materials for VOC and carbonyl sampling. Care must be taken to ensure that the sample residence time is kept to 20 seconds or less.

(c) No matter how nonreactive the sampling probe material is initially, after a period of use reactive particulate matter is deposited on the probe walls. Therefore, the time it takes the gas to transfer from the probe inlet to the sampling device is also critical. Ozone in the presence of nitrogen oxide (NO) will show significant losses even in the most inert probe material when the residence time exceeds 20 seconds.[26] Other studies [27–28] indicate that a 10 second or less residence time is easily achievable. Therefore, sampling probes for reactive gas monitors at NCore and at NO_2 sites must have a sample residence time less than 20 seconds.

10. Waiver Provisions

Most sampling probes or monitors can be located so that they meet the requirements of this appendix. New sites with rare exceptions, can be located within the limits of this appendix. However, some existing sites may not meet these requirements and still produce useful data for some purposes. The EPA will consider a written request from the State agency to waive one or more siting criteria for some monitoring sites providing that the State can adequately demonstrate the need (purpose) for monitoring or establishing a monitoring site at that location.

10.1 For establishing a new site, a waiver may be granted only if both of the following criteria are met:

10.1.1 The site can be demonstrated to be as representative of the monitoring area as it would be if the siting criteria were being met.

10.1.2 The monitor or probe cannot reasonably be located so as to meet the siting criteria because of physical constraints (e.g., inability to locate the required type of site the necessary distance from roadways or obstructions).

10.2 However, for an existing site, a waiver may be granted if either of the criteria in sections 10.1.1 and 10.1.2 of this appendix are met.

10.3 Cost benefits, historical trends, and other factors may be used to add support to the criteria in sections 10.1.1 and 10.1.2 of this appendix, however, they in themselves, will not be acceptable reasons for granting a waiver. Written requests for waivers must be submitted to the Regional Administrator.

11. Summary

Table E–4 of this appendix presents a summary of the general requirements for probe and monitoring path siting criteria with respect to distances and heights. It is apparent from Table E–4 that different elevation distances above the ground are shown for the various pollutants. The discussion in this appendix for each of the pollutants describes reasons for elevating the monitor, probe, or monitoring path. The differences in the specified range of heights are based on the vertical concentration gradients. For CO and near-road NO_2 monitors, the gradients in the vertical direction are very large for the microscale, so a small range of heights are used. The upper limit of 15 meters is specified for the consistency between pollutants and to allow the use of a single manifold or monitoring path for monitoring more than one pollutant.

Table E-4 of Appendix E to Part 58--Summary of Probe and Monitoring Path Siting Criteria

Pollutant	Scale (maximum monitoring path length, meters)	Height from ground to probe, inlet or 80% of monitoring path[1] (meters)	Horizontal and vertical distance from supporting structures[2] to probe, inlet or 90% of monitoring path[1] (meters)	Distance from trees to probe, inlet or 90% of monitoring path[1] (meters)	Distance from roadways to probe, inlet or monitoring path[1] (meters)
SO_2 [3, 4, 5, 6]	Middle (300 m) Neighborhood Urban, and Regional (1 km)	2-15	>1	>10	N/A.
CO[4,5,7]	Micro [downtown or street canyon sites], micro [near-road sites], middle (300 m) and Neighborhood (1 km)	2.5-3.5; 2-7; 2-15	>1	>10	2-10 for downtown areas or street canyon microscale; ≤50 for near-road microscale; see Table E-2 of this appendix for middle and neighborhood scales.
O[3,4,5]	Middle (300 m) Neighborhood, Urban, and	2-15	>1	>10	See Table E-1 of this appendix for all scales.

	Regional (1 km)				
NO_2 [3,4,5]	Micro (Near-road [50-300 m])	2-7 (micro);	>1	>10	≤50 for near-road micro-scale.
	Middle (300 m)	2-15 (all other scales)			
	Neighborhood, Urban, and Regional (1 km)				See Table E-1 of this appendix for all other scales.
Ozone precursors (for PAMS)[3,4,5]	Neighborhood and Urban (1 km)	2-15	>1	>10	See Table E-4 of this appendix for all scales.
PM, Pb[3,4,5,6,8]	Micro, Middle, Neighborhood, Urban and Regional	2-7 (micro); 2-7 (middle $PM_{10-2.5}$); 2-7 for near-road; 2-15 (all other scales)	>2 (all scales, horizontal distance only)	>10 (all scales)	2-10 (micro); see Figure E-1 of this appendix for all other scales. ≤50 for near-road.

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Footnotes

1 Distance from the edge of the nearest traffic lane. The distance for intermediate traffic counts should be interpolated from the table values based on the actual traffic count.

2 Applicable for ozone monitors whose placement has not already been approved as of December 18, 2006.

1 Distance from the edge of the nearest traffic lane. The distance for intermediate traffic counts should be interpolated from the table values based on the actual traffic count.

N/A--Not applicable.

1 Monitoring path for open path analyzers is applicable only to middle or neighborhood scale CO monitoring, middle, neighborhood, urban, and regional scale NO_2 monitoring, and all applicable scales for monitoring SO_2, O_3, and O_3 precursors.

2 When probe is located on a rooftop, this separation distance is in reference to walls, parapets, or penthouses located on roof.

3 Should be greater than 20 meters from the dripline of tree(s) and must be 10 meters from the dripline when the tree(s) act as an obstruction.

4 Distance from sampler, probe, or 90 percent of monitoring path to obstacle, such as a building, must be at least twice the height the obstacle protrudes above the sampler, probe, or monitoring path. Sites not meeting this criterion may be classified as middle scale (see text).

5 Must have unrestricted airflow 270 ° around the probe or sampler; 180 ° if the probe is on the side of a building or a wall.

6 The probe, sampler, or monitoring path should be away from minor sources, such as furnace or incineration flues. The separation distance is dependent on the height of the minor source's emission point (such as a flue), the type of fuel or waste burned, and the quality of the fuel (sulfur, ash, or lead content). This criterion is designed to avoid undue influences from minor sources.

7 For micro-scale CO monitoring sites, the probe must be >10 meters from a street intersection and preferably at a midblock location.

8 Collocated monitors must be within 4 meters of each other and at least 2 meters apart for flow rates greater than 200 liters/min or at least 1 meter apart for samplers having flow rates less than 200 liters/min to preclude airflow interference, unless a waiver is in place as approved by the Regional Administrator pursuant to section 3 of Appendix A.