

United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Argued May 3, 2012

Decided July 20, 2012

No. 10-1252

NATIONAL ENVIRONMENTAL DEVELOPMENT ASSOCIATION'S
CLEAN AIR PROJECT,
PETITIONER

v.

ENVIRONMENTAL PROTECTION AGENCY,
RESPONDENT

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY, ET
AL.,
INTERVENORS

Consolidated with 10-1254, 10-1255, 10-1256, 10-1258,
10-1259, 11-1073, 11-1080, 11-1081, 11-1090, 11-1092

On Petitions for Review of a Final Action of the
United States Environmental Protection Agency

Paul M. Seby, Special Assistant Attorney General, Office of the Attorney General for the State of North Dakota, et al., argued the cause for petitioner State of North Dakota. *Mark W. DeLaquil* argued the cause for petitioner ASARCO LLC. With them on the briefs were *Wayne Stenehjem*, Attorney General, Office of the Attorney General for the State of North Dakota,

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Madison B.C. Miller was on the brief for *amicus curiae* Oklahoma Department of Environmental Quality in support of state petitioners, non-state petitioners and supporting intervenors.

Norman L. Rave Jr., Attorney, U.S. Department of Justice, argued the cause for respondent. With him on the brief were *Steven Silverman*, Attorney, United States Environmental Protection Agency, and *Michael Thrift*, Attorney.

Seth L. Johnson and *David S. Baron* were on the brief for respondent-intervenors American Lung Association, et al.

Before: SENTELLE, *Chief Judge*, KAVANAUGH, *Circuit Judge*, and GINSBURG, *Senior Circuit Judge*.

Opinion for the Court filed by *Chief Judge* SENTELLE.

SENTELLE, *Chief Judge*: Several states and state regulatory agencies, together with corporations and industrial associations, petition for review of the Environmental Protection Agency's rule entitled "Primary National Ambient Air Quality Standard for Sulfur Dioxide," and of the subsequent denial of petitions for reconsideration of the standard. Petitioners contend, first, that EPA failed to follow notice-and-comment rulemaking procedures, and second, that the agency arbitrarily set the maximum sulfur dioxide (SO₂) concentration at a level lower than statutorily authorized. For the reasons discussed more fully below, we conclude that the challenge to the rulemaking procedure is not within our jurisdiction and must be dismissed. We further conclude that EPA did not act arbitrarily in setting the level of SO₂ emissions and therefore deny that portion of the petitions for review.

I. Background

A. The Clean Air Act

The Clean Air Act (CAA) in §§ 108 and 109 requires EPA to establish, review, and revise air quality criteria and standards, allowing an "adequate margin of safety." 42 U.S.C. §§ 7408, 7409. The 1970 amendments to the Act required the Administrator to publish a list of air pollutants it intended to regulate under the Act, including all those pollutants the Administrator found reasonably could be anticipated to endanger public health. 42 U.S.C. § 7408(a)(1). For each listed pollutant, the Administrator had to issue air quality criteria that "accurately reflect[ed] the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of such pollutant in the ambient air, in varying quantities," including the effects of a pollutant when it combines with other factors such as atmospheric conditions or other pollutants. 42

U.S.C. § 7408(a)(2).

The CAA required the Administrator to promulgate a primary and secondary National Ambient Air Quality Standard (NAAQS) for each listed pollutant by 1971 and to review and revise those standards as appropriate every five years. 42 U.S.C. § 7409(a), (d)(1). The Act requires that the primary standards “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.” 42 U.S.C. § 7409(b)(1).

The Act vests each State with “the primary responsibility for assuring air quality within the entire geographic area comprising such State” 42 U.S.C. § 7407(a). After EPA promulgates a new final standard, the Act gives States a chance to recommend whether areas within their boundaries should be designated as “nonattainment,” “attainment,” or “unclassifiable,” and the Agency makes the final designation. 42 U.S.C. § 7407(d). States then must submit State Implementation Plans (SIPs), which, after receiving EPA approval, impose federally enforceable controls on air pollution sources so States can attain and maintain the NAAQS. 42 U.S.C. §§ 7410, 7502, 7514-7514a.

B. Regulatory Background: Sulfur Dioxide NAAQS

Sulfur dioxide, a “highly reactive colorless gas,” derives mostly from fossil fuel combustion. It smells like rotting eggs and, at elevated concentrations in the air, can cause acid rain. Its presence in the ambient air can cause adverse health effects, particularly in asthmatics. See *Am. Lung Ass’n v. EPA*, 134 F.3d 388, 389 (D.C. Cir. 1998).

On April 30, 1971, EPA promulgated the first primary NAAQS for SO₂ concentrations in the ambient air. 36 Fed. Reg. 8186 (Apr. 30, 1971). The standard set a 24-hour concentration limit of 140 parts per billion (ppb) SO₂, and an annual average limit of 30 ppb. *Id.* at 8187. Over the next three decades, EPA reviewed the standard, but did not revise it. *See* 74 Fed. Reg. 64810, 64813 (Dec. 8, 2009) (providing history of the SO₂ NAAQS).

In 1988, EPA declined to revise the NAAQS, but requested comment on a proposal to add a new 1-hour primary standard of 400 ppb to protect against five- to ten-minute bursts of SO₂ concentrations. 53 Fed. Reg. 14926 (Apr. 26, 1988). In response to those comments and other developments, in 1994, EPA offered several more options for comment, including the addition of a five-minute standard of 600 ppb. 59 Fed. Reg. 58958 (Nov. 15, 1994). After concluding its review of these proposals and comments in 1996, EPA announced it would not revise the NAAQS. In its review, it found that under the current standards at that time, thousands of asthmatics could be exposed to enough short-term bursts of SO₂ that their lung function could be impaired. 61 Fed. Reg. 25566, 25572 (May 22, 1996). EPA concluded, however, that such effects “do not pose a broad public health problem when viewed from a national perspective” and did not warrant revisions to the SO₂ NAAQS. *Id.* at 25572, 25575.

The American Lung Association and the Environmental Defense Fund challenged before this Court the Administrator’s decision not to implement a five-minute standard. We found that EPA had failed to explain adequately how it reached its decision not to revise the NAAQS, given that the Administrator had found that short-term exposures to bursts of SO₂ could significantly affect the lung function of thousands of asthmatics. *Am. Lung Ass’n*, 134 F.3d at 392-93 (D.C. Cir. 1998).

Accordingly, we remanded the decision to EPA.

In response, EPA initiated the review of the SO₂ NAAQS that eventually led to this proceeding. *See* 71 Fed. Reg. 28023 (May 15, 2006). Based on that review, EPA proposed a rule to revise the primary SO₂ standard. EPA proposed, *inter alia*, to revoke the current 24-hour and annual standards and to establish a standard to target short-term bursts of SO₂ exposure—specifically, a 99th percentile 1-hour daily maximum standard level set somewhere between 100 ppb and 50 ppb. 74 Fed. Reg. 64810, 64845-86 (Dec. 8, 2009). EPA also proposed to amend ambient air monitoring, reporting, and network design requirements. The proposal focused on increasing and updating the monitoring network to support the proposed 1-hour standard. 74 Fed. Reg. at 64846-47.

C. The Final Rule

After receiving comments on its rule proposal, EPA issued a final rule addressing the primary SO₂ standard. 75 Fed. Reg. 35520 (June 22, 2010). Petitioners challenge two parts of the final rulemaking, which we describe here—the level at which EPA set the standard and a portion of its statements regarding the implementation plan for the standard.

1. *Level*

EPA mandated that States must meet a new 1-hour SO₂ standard using a 99th percentile form, set at 75 ppb maximum SO₂ concentration. 75 Fed. Reg. at 35548. The goal of the new standard is to prevent asthmatics from being exposed to short-term, five- to ten-minute bursts of SO₂, which EPA found could cause lung function decrements in asthmatics. *Id.*

EPA explained that it conducted substantial amounts of new research to determine the appropriate level for the 1-hour SO₂ NAAQS. 75 Fed. Reg. at 35524. In 2008, EPA staff prepared an Integrated Science Assessment (ISA), which summarized the latest scientific knowledge regarding effects of exposure to SO₂. In 2009, EPA staff prepared a Risk and Exposure Assessment (REA) to quantify the public health effects of exposure to SO₂ in the ambient air. *See* 75 Fed. Reg. at 35523-24 (discussing development of ISA and REA). The ISA and REA focused on two types of studies—controlled human exposure clinical studies and epidemiologic studies. *See* 75 Fed. Reg. at 35525. The controlled human exposure studies examined the effects of varying levels of SO₂ on unmedicated asthmatics performing exercises. The studies did not test subjects with severe asthma because of ethical concerns. 75 Fed. Reg. at 35533. The epidemiologic studies considered whether a statistical association exists between levels of SO₂ in the ambient air and the occurrence of events such as hospital admissions and emergency room visits for respiratory ailments. The ISA and REA also reviewed animal studies. 75 Fed. Reg. at 35525.

The epidemiologic studies showed that in geographic areas meeting the previous 24-hour and annual concentration limits, there were positive associations between ambient air concentrations of SO₂ and respiratory symptoms in children, emergency department visits, and hospitalizations for respiratory conditions. *Id.*

Clinical studies showed that mild and moderate asthmatics exposed to SO₂ concentrations as low as 200 to 300 ppb for five to ten minutes experienced moderate or greater decrements in lung function. *See* 75 Fed. Reg. at 35525. As SO₂ exposure increased, both the severity of the decrements and the number of asthmatics affected increased. *Id.* At 400 ppb and greater, the effects often were statistically significant at the group mean

level and were accompanied by respiratory symptoms. *Id.* In the REA, EPA determined that a 1-hour NAAQS set at 50 to 100 ppb could limit exposures of exercising asthmatic children to five-minute peak SO₂ levels greater than or equal to 400 ppb. A 1-hour 150 ppb standard could limit their exposure to five-minute 400 ppb concentrations, but would provide “appreciably less” protection to five-minute exposures of 200 ppb concentrations. 75 Fed. Reg. at 35528-29.

The EPA Administrator determined that the studies showed that the NAAQS should protect asthmatics from 200 ppb short-term bursts of SO₂. She concluded that a 1-hour standard level set at 75 ppb would accomplish this goal and provide an adequate margin of safety. 75 Fed. Reg. at 35548.

2. Implementation

In the preamble to the final rule, EPA also explained that, based on comments it received, “we are revising our general anticipated approach toward implementation of the new 1-hour NAAQS.” 75 Fed. Reg. at 35550. Instead of assessing attainment of the standard primarily by monitoring the ambient air, as it had stated it would in the proposed rule, EPA suggested it would use a “hybrid analytic approach” that would combine monitoring with computer modeling to determine compliance. 75 Fed. Reg. at 35551.

Several states and environmental regulatory bodies of states charged with implementing the SO₂ standards, along with several companies and coalitions that represent industries that emit SO₂ as a byproduct of their industrial activities, petition for review of the EPA’s rulemaking. Petitioners allege two errors in the EPA’s proceedings. All Petitioners contend that EPA violated the notice-and-comment rulemaking provisions of the Administrative Procedure Act (APA), 5 U.S.C. § 553, by

mandating a hybrid modeling-monitoring implementation approach rather than a monitoring-only approach. Only the non-state petitioners bring the second challenge, contending that the Agency's decision to set the new 1-hour SO₂ standard at 75 ppb was arbitrary and capricious.

II. Analysis

A. Computer Modeling Provisions

Petitioners argue that EPA failed to follow the notice-and-comment rulemaking provisions of the APA because it did not include in its proposed rule any suggestion that EPA was considering changing its method of determining attainment of the SO₂ standard from an air-monitoring approach to a hybrid approach using computer modeling in combination with air monitoring. The APA requires agencies to publish proposed rules in the Federal Register and afford interested parties opportunity to comment on the proposals. 5 U.S.C. § 553; *see PPG Indus., Inc. v. Costle*, 659 F.2d 1239, 1241 (D.C. Cir. 1981) (requiring EPA to comply with APA notice-and-comment rulemaking procedures when changing a NAAQS implementation program). Petitioners point out that statements in the preamble to the final rule suggesting a computer-modeling and air-monitoring approach were not part of the original proposed rule submitted for notice and comment, and that therefore they had no opportunity to comment thereon.

We do not have jurisdiction, however, to consider whether EPA has violated APA rulemaking procedures because the challenged statements do not constitute final agency action. The CAA provides that this Court has jurisdiction to review “any national primary or secondary ambient air quality standard . . . or *final action* taken . . . by the Administrator.” 42 U.S.C. § 7607(b) (emphasis added); *see Indep. Equip. Dealers Ass’n v.*

EPA, 372 F.3d 420, 426 (D.C. Cir. 2004). An agency action is “final” if it meets two conditions: the action must “mark the consummation of the agency’s decisionmaking process,” and the action must be “one by which rights or obligations have been determined, or from which legal consequences will flow.” *Bennett v. Spear*, 520 U.S. 154, 177-78 (1997) (internal quotation marks and citation omitted). The challenged statements in the preamble here do not meet these conditions.

Petitioners compare the preamble’s statements here to the statements in the preamble to the final rule challenged in *Natural Resources Defense Council v. EPA*, 571 F.3d 1245 (D.C. Cir. 2009). There, we recognized that the challenged statements were “not conjectural” and that their “terms [were] clear,” so therefore it was “fair to infer that the EPA intended the statements to create binding legal consequences.” *Id.* at 1252 n.2. Here, the preamble’s statements about the hybrid approach are much less clear, demonstrating that the statements do not mark the consummation of agency action, and they do not create obligations from which legal consequences will flow. The preamble explains that given the comments EPA received regarding the proposed monitoring approach, “we are revising our general anticipated approach toward implementation of the new 1-hour NAAQS.” 75 Fed. Reg. at 35550. It cautions that the discussions here “explain our expected and intended future action in implementing the new 1-hour NAAQS—in other words, they constitute guidance, rather than final agency action—and it is possible that our approaches may continue to evolve as we, States, and other stakeholders proceed with actual implementation.” *Id.* In discussing the specifics of its intended hybrid approach, EPA states that, “[w]e believe that some type of hybrid approach is more consistent with our historical approach and longstanding guidance toward SO₂ than what we originally proposed.” *Id.* at 35551. EPA explains that it “anticipates making the determination of when monitoring alone

is ‘appropriate’ for a specific area on a case-by-case basis, informed by the area’s factual record, as part of the designations process,” citing as an example of a situation in which monitoring might be the preferred approach an area in which a shipping port is the only significant stationary source of SO₂. *Id.* at 35552 n.22. EPA notes that it “intends to solicit public comment prior to finalizing this guidance.” *Id.* at 35552. This language all suggests an indefinite, anticipated plan.

We do not suggest that if the language had imposed definite requirements upon states or regulated industries we would be bound by the agency’s characterization. Certainly if that were the case, we could consider rejecting the characterization and consider Petitioners’ challenges to what might then be final agency action for purposes of judicial review. *See Barrick Goldstrike Mines Inc. v. Browner*, 215 F.3d 45, 48 (D.C. Cir. 2000) (agency labels regarding finality or lack thereof are not determinative). But the preamble imposes no such requirements. EPA explained that it expected to make initial attainment designations in 2012 based on existing monitoring capabilities, as well as “any refined modeling the State chooses to conduct specifically for initial area designations.” 75 Fed. Reg. at 35552. That language does not impose new legal obligations to use modeling.

To be sure, because EPA now intends to use this hybrid approach, it has scaled back its proposed plans to develop a more extensive monitoring network. 75 Fed. Reg. at 35551 (“This projected change in approach would necessarily result in a lesser emphasis on the less appropriate, more expensive, and slower to establish monitoring tool than did the proposed rule. Therefore, the minimum requirements for the SO₂ monitoring network in this final rule are of a smaller scale than proposed”). Petitioners do not argue, however, that they have suffered an injury by not being required to build a more

extensive monitoring network. Petitioners will be free to challenge any final action EPA takes that imposes an obligation Petitioners must meet. The challenged provisions here do not meet that standard.

B. NAAQS Level

Some Petitioners also challenge the level at which EPA set the maximum concentration for the new 1-hour SO₂ standard, arguing that 75 ppb is lower than “requisite” to protect public health. We have jurisdiction to consider this challenge under CAA Section 307(b)(1), which provides that this Court has exclusive jurisdiction over petitions for review of national ambient air quality standards promulgated by the EPA Administrator. 42 U.S.C. § 7607(b)(1). Under the CAA, we will set aside the Agency’s determination only if it is “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.” 42 U.S.C. § 7607(d)(9)(A); *see also* APA Section 706 (5 U.S.C. § 706); *Ethyl Corp. v. EPA*, 51 F.3d 1053, 1064 (D.C. Cir. 1995) (arbitrary and capricious standard under the CAA is interpreted in “essentially the same” way as the same standard under the APA). We owe deference to the Administrator’s determination regarding the reliability of scientific evidence. *Am. Trucking Ass’n v. EPA*, 283 F.3d 355, 374 (D.C. Cir. 2002). Although we must perform a “searching and careful” inquiry into the facts, we do not look at the decision as would a scientist, but “as a reviewing court exercising our narrowly defined duty of holding agencies to certain minimal standards of rationality.” *Ethyl Corp. v. EPA*, 541 F.2d 1, 36-37 (D.C. Cir. 1976) (en banc).

Under the Clean Air Act, the EPA Administrator must set NAAQS at a level “requisite to protect the public health,” “allowing an adequate margin of safety.” 42 U.S.C. § 7409(b)(1). This Court has recognized that Congress defined

public health broadly, requiring NAAQS to “protect not only average healthy individuals, but also ‘sensitive citizens,’” such as children or people afflicted with asthma, emphysema, or other conditions causing sensitivity to air pollution. *Am. Lung Ass’n*, 134 F.3d at 389 (citing SEN. REP. No. 91-1196, at 10 (1970)). The Supreme Court has held that NAAQS are set at the “requisite” level if they are set at a level “not lower or higher than is necessary” to protect public health. *Whitman v. Am. Trucking Ass’ns*, 531 U.S. 457, 475-76 (2001); *see also* 75 Fed. Reg. at 35521 (EPA must “establish standards that are neither more nor less stringent than necessary.”).

1. *Interpretation of Human Clinical Studies*

Petitioners first argue that the Administrator’s decision to adopt a 75 ppb standard was arbitrary and capricious because EPA misinterpreted the controlled human exposure clinical studies. Specifically, they criticize how EPA applied guidelines published by the American Thoracic Society (ATS) regarding what constitutes an adverse effect of air pollution.

The ATS guidelines recommend that reversible loss of lung function in individuals in combination with respiratory symptoms should be considered adverse. *See* 75 Fed. Reg. at 35531. The guidelines also recommend that an increased risk to a population caused by a pollutant, even if the risk to a single individual is not increased, should be considered an adverse effect because individuals within that group would have diminished reserve function and would be at an increased risk if affected by another agent. 75 Fed. Reg. at 35526.

Petitioners argue that EPA concedes that the clinical studies only have shown that five-minute exposures to SO₂ produce adverse effects at 400 ppb and above. Pet. Br. at 45-46 (citing 75 Fed. Reg. at 35526-27). Thus, Petitioners reason, EPA has not

shown that five-minute exposures to SO₂ levels below 400 ppb cause adverse effects in individuals. Regarding the population-level standard, petitioners claim first that EPA failed to find a causal relationship between five-minute exposures to SO₂ at levels below 400 ppb and the decrements in lung function and, second, that EPA extrapolated individual data from the clinical studies to represent the effect of SO₂ on a population level. Pet. Br. at 46-48.

EPA, however, was not bound to set the SO₂ standard according to the ATS guidelines. The guidelines merely provided one reference point to help EPA and the public understand what should be considered an adverse effect of SO₂ on human health.

On the other hand, the EPA Administrator is bound by statute to promulgate NAAQS that are “requisite to protect the public health” “allowing an adequate margin of safety.” 42 U.S.C. § 7409(b)(1). It could not then exceed EPA’s authority to choose a level below that which produced adverse effects in the clinical studies in order to set a standard that allows an adequate margin of safety. Further, the clinical studies did not test severe asthmatics or very young children. EPA concluded that it was reasonable to assume that those vulnerable populations would suffer more serious health effects than mild and moderate asthmatics. 75 Fed. Reg. at 35526 & n.5. We cannot say it was unreasonable for EPA to consider these vulnerable populations in setting the standard.

Further, in issuing the final rule, EPA considered more than the ATS adversity standards. EPA explains it considered the advice and recommendations it received from Clean Air Scientific Advisory Committee, an independent scientific review committee, and the conclusions drawn from previous NAAQS reviews. *Id.* at 35526. EPA also considered epidemiologic

studies, which we discuss in greater detail below, to inform its view of the population-level risk.

2. *Choice of Epidemiologic Studies*

Petitioners contend that the decision to adopt a 75 ppb standard was arbitrary and capricious because EPA “cherry-pick[ed]” studies that supported its preferred result, while ignoring studies that would support a higher standard. Pet. Br. at 42. To make this argument, Petitioners point to language in the final rule which they claim affirms that the epidemiologic studies upon which EPA relied to set the 75 ppb standard “suffered from a ‘major methodological issue’ arising from ‘the extent to which other air pollutants,’ particularly fine particulate matter, ‘may confound or modify SO₂-related effect estimates.’” Pet. Br. at 44 (quoting 75 Fed. Reg. at 35531); *see also* Pet. Br. at 50-51, 53. Petitioners suggest that EPA “assumed away” the problem by relying on controlled human exposure studies to lend “biological plausibility” to the Agency’s preferred results. Pet. Br. at 44.

The quotations selected by Petitioners, however, only support Petitioners’ arguments when taken out of their original context. In the final rule, EPA explains that it has conducted substantial amounts of new research to determine the appropriate level for the 1-hour SO₂ NAAQS. 75 Fed. Reg. at 35524. As described above, EPA reviewed controlled human exposure studies in which exercising asthmatics were exposed to five- to ten-minute bursts of SO₂, epidemiologic studies relying mostly on 1-hour and 24-hour standards, and animal toxicologic studies examining animal exposures to SO₂ for short periods of time. 75 Fed. Reg. at 35525. Out of context, the language Petitioners quote, as presented above, would suggest that when reviewing the epidemiologic studies, EPA failed to consider how other pollutants might affect the results of those studies. In fact, the

full quotation states as follows:

Although EPA has recognized that multiple factors can contribute to the etiology of respiratory disease and that more than one air pollutant could independently impact respiratory health, we continue to judge, as discussed in the ISA, that the available evidence supports the conclusion that there is an independent effect of SO₂ on respiratory morbidity. In reaching this judgment, we recognize that a major methodological issue affecting SO₂ epidemiologic studies concerns the evaluation of the extent to which other air pollutants, particular [sic] PM_{2.5}, may confound or modify SO₂-related effect estimates. The use of multi-pollutant regression models is a common approach for evaluating potential confounding by co-pollutants in epidemiologic studies. It is therefore important to note that when the ISA evaluated U.S. and international epidemiologic studies employing multi-pollutant models, SO₂ effect estimates generally remained positive and relatively unchanged when co-pollutants, including PM, were included.

75 Fed. Reg. at 35531. Thus, in context, the language Petitioners cite to support their argument that EPA failed to consider the effects of other pollutants in the epidemiologic studies actually demonstrates that EPA did take other pollutants into consideration, and even when it did so, the results “remained positive and relatively unchanged.” EPA concedes that there are “uncertainties” associated with separating the various pollutants’ effects, but that “the limited available evidence indicates that the effect of SO₂ on respiratory health outcomes appears to be generally robust and independent of the effects of gaseous co-pollutants, including NO₂ and O₃, as well as particulate co-pollutants, particularly PM_{2.5}.” 75 Fed. Reg. at 35531.

Further, although Petitioners accuse EPA of “cherry-picking” its friends, EPA offers a reasonable explanation for why it relied most heavily on three particular epidemiologic studies. EPA explains that it relied on those three studies, out of the more than fifty peer reviewed studies available, precisely because these three were conducted in the United States and included multi-pollutant models to help address the “major methodological issue” that Petitioners contend EPA ignored. *See* 75 Fed. Reg. at 35547 (recognizing that “there is special sensitivity in this review in disentangling PM-related effects . . . from SO₂-related effects in interpreting the epidemiologic studies”). EPA concluded that the epidemiologic evidence supported a 75 ppb standard, 75 Fed. Reg. at 35548, and the controlled human exposure studies supported the plausibility of the associations reported in the epidemiologic studies, 75 Fed. Reg. at 35544.

Based on its review of all of those studies, EPA found a “causal relationship between respiratory morbidity and short-term (5-minutes to 24-hours) exposure to SO₂.” 75 Fed. Reg. at 35525. A “causal relationship” finding is the strongest finding the ISA can make. *Id.* EPA concluded that the collected evidence showed that five- to ten-minute exposures to SO₂ concentrations at least as low as 200 ppb can result in adverse health effects in five to thirty percent of the exercising asthmatics tested in the controlled human exposure studies, 75 Fed. Reg. at 35526, and that a 75 ppb 1-hour limit would “substantially limit asthmatics’ exposure” to such concentrations, allowing a reasonable margin for safety, 75 Fed. Reg. at 35548.

Based on the record discussed above, we cannot conclude that the choice EPA made to give especial weight to the three studies conducted in the United States that accounted for the effects of SO₂ concentrations using multi-pollutant regression models was arbitrary or capricious.

3. *Statistical Significance*

Petitioners also argue that EPA acted arbitrarily in setting the 1-hour standard at 75 ppb because EPA did not rely on studies that showed a statistically significant association between exercising asthmatics' lung function decrements and short-term exposures to air concentrations of 200 ppb SO₂. Pet. Br. at 43, 45-47, 48. We disagree. EPA found that five- to ten-minute exposures to SO₂ caused statistically significant lung function decrements when asthmatics were exposed to 400 ppb SO₂ or greater. 75 Fed. Reg. at 35525. Although EPA recognized that the results did not remain statistically significant when the concentrations sank to 200 to 300 ppb, EPA reasoned that the clinical study results "could reasonably indicate an SO₂-induced shift in these lung function measurements for [exercising asthmatics]." 75 Fed. Reg. at 35526. Further, the studies did not include severe asthmatics. EPA concluded that it was "reasonable to presume" that people with more severe asthma would suffer more serious health consequences from short-term exposures to 200 ppb SO₂. 75 Fed. Reg. at 35526.

We have held before that EPA has discretion to set a NAAQS at a concentration level below a level that has been demonstrated to have a statistically significant association with negative health effects. See *Am. Trucking Ass'ns*, 283 F.3d at 371. Just so now. We cannot say that the studies necessitated a 75 ppb standard, but we also cannot say that such a standard is unreasonable or unsupported by the record before us. See *id.* at 372.

4. *Current Air Quality Standards*

Finally, Petitioners argue that the new SO₂ standard is arbitrary and capricious because EPA ignored its own finding that the new standard would create few new health benefits

compared to current air quality standards and other CAA provisions that would prevent air quality from deteriorating to the level of the existing NAAQS. Pet. Br. at 55 (citing 75 Fed. Reg. at 35533-34). Petitioners explain that the CAA only gives EPA authority to revise NAAQS “as appropriate” and reason that it is inappropriate for EPA to revise the standards when current air quality does not warrant a revision to protect public health. Pet. Br. at 57-58 (citing 42 U.S.C. § 7409(d)(1)).

Nothing in the CAA requires EPA to give the current air quality such a controlling role in setting NAAQS. And as Petitioners themselves note, the CAA gives EPA significant discretion to decide whether to revise NAAQS. Further, in the final rule, EPA cites evidence that current levels of SO₂ in the ambient air, even when the air quality meets the current SO₂ NAAQS, still cause respiratory effects in some areas. 75 Fed. Reg. at 35530-31. In short, EPA had discretion to revise the NAAQS and Petitioners’ argument is unavailing.

III. Conclusion

For the foregoing reasons, we dismiss the petitions in part and deny in part.