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Revision of December 2000 Regulatory Finding on the Emissions of Hazardous Air Pollutants From Electric Utility Steam Generating Units and the Removal of Coal- and Oil-Fired Electric Utility Steam Generating Units From the Section 112(c) List; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 63

[OAR–2002–0056; FRL–7887–7]

RIN 2060–AM96

Revision of December 2000 Regulatory Finding on the Emissions of Hazardous Air Pollutants From Electric Utility Steam Generating Units and the Removal of Coal- and Oil-Fired Electric Utility Steam Generating Units From the Section 112(c) List

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The EPA is revising the regulatory finding that it issued in December 2000 pursuant to section 112(n)(1)(A) of the Clean Air Act (CAA), and based on that revision, removing coal- and oil-fired electric utility steam generating units (''coal- and oil-fired Utility Units'') from the CAA section 112(c) source category list. Section 112(n)(1)(A) of the CAA is the threshold statutory provision underlying today's action. That provision requires EPA to conduct a study to examine the hazards to public health that are reasonably anticipated to occur as the result of hazardous air pollutant (HAP) emissions from Utility Units after imposition of the requirements of the CAA. The provision also provides that EPA shall regulate Utility Units under section 112, but only if the Administrator determines that such regulation is both ''appropriate'' and ''necessary'' considering, among other things, the results of the study. EPA completed the study in 1998 (the Utility Study), and in December 2000 found that it was ''appropriate and necessary'' to regulate coal- and oil-fired Utility Units under CAA section 112. That December 2000 finding focused primarily on mercury (Hg) emissions from coal-fired Utility Units. In light of the finding, EPA in December 2000 announced its decision to list coal- and oil-fired Utility Units on the section 112(c) list of regulated source categories. In January 2004, EPA proposed revising the December 2000 appropriate and necessary finding and, based on that revision, removing coal- and oil-fired Utility Units from the section 112(c) list.

By this action, we are revising the December 2000 appropriate and necessary finding and concluding that it is neither appropriate nor necessary to regulate coal- and oil-fired Utility Units under section 112. We are taking this action because we now believe that the December 2000 finding lacked foundation and because recent information demonstrates that it is not appropriate or necessary to regulate coal- and oil-fired Utility Units under section 112. Based solely on the revised finding, we are removing coal- and oil-fired Utility Units from the section 112(c) list. The reasons supporting this action are described in detail below. Other actions related to this final rule include the recent promulgation of the final Clean Air Interstate Rule (CAIR) and the final Clean Air Mercury Rule (CAMR).

DATES: *Effective Date:* The effective date of the final rule is March 29, 2005.

ADDRESSES: EPA has established a docket for this action under Docket ID No. OAR–2002–0056. All documents in the docket are listed in the EDOCKET index at *http://www.epa.gov/edocket*. Although listed in the index, some information is not publicly available, *i.e.*, Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically in EDOCKET or in hard copy at the EPA Docket Center (EPA/DC), EPA West Building, Room B102, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the EPA Docket Center is (202) 566–1742.

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Judicial Review. Pursuant to CAA section 307(b), judicial review of this final rule is available only by filing a petition for review in the United States Court of Appeals for the District of Columbia Circuit by May 31, 2005. EPA designates this action a CAA section 307(d) rulemaking. (See CAA section 307(d)(1)(V); 69 FR 4653 (January 30, 2004).) Under CAA section 307(d)(7)(B), only an objection to the rule that was raised with reasonable specificity during the time period for public comment can be raised during judicial review. Section 307(d)(7)(B) further provides that if the person raising the objection can demonstrate to the Administrator that it was impracticable to raise the objection during the public comment period or if the grounds for the objection arose after the public comment period but within the time period specified for judicial review and if the objection is of central relevance, EPA will 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.

I. Statutory Background

In the 1990 Amendments to the CAA, Congress substantially modified CAA section 112, the provision of the CAA addressing HAP. Among other things, section 112 contains a list of ''hazardous air pollutants,'' which are ''pollutants which present, or may present, * * * a threat of adverse human health effects * * * or adverse environmental effects whether through ambient concentrations, bioaccumulation, deposition, or otherwise.'' (See CAA section 112(b)(2).) In the 1990 amendments to the CAA, Congress listed 190 HAP, and authorized EPA to add or remove pollutants from the list.[1] (See CAA Section 112(b)(1)–(b)(3).)

The types of sources addressed under section 112 include: major sources, area sources, and electric utility steam generating units (Utility Units). (See CAA 112(a)(1), (a)(2), (a)(8).) A ''major source'' is any stationary source[2] or group of stationary sources at a single location and under common control that emits or has the potential to emit ten tons or more per year of any HAP or 25 tons or more per year of any combination of HAP. (See CAA 112(a)(1).) A stationary source of HAP that is not a ''major source'' is an ''area source.'' (See CAA 112(a)(2).) Finally, an electric utility steam generating unit is any ''fossil fuel fired combustion unit of more than 25 megawatts that serves a generator that produces electricity for sale.'' (See CAA 112(a)(8).)

There are two important steps under section 112: (1) Determining whether a source category meets the statutory criteria for regulation under section 112; and (2) promulgating emission standards for those source categories regulated under section 112. In terms of the first step, Congress required EPA to publish a list of categories and

[1] The current section 112(b) list includes 188 HAP.

[2] A ''stationary source'' of hazardous air pollutants is any building, structure, facility or installation that emits or may emit any air pollutant. (See CAA Section 111(a)(3) and 112(a)(3).)

subcategories of major sources and area sources by November 15, 1991.[3] (See CAA 112(c)(1) & (c)(3).) Congress further directed EPA to revise this initial list periodically, based on, for example, new information. (See 112(c)(1).) EPA is required to list a category of major sources under section 112(c)(1) if at least one stationary source in the category meets the definition of a major source—*i.e.*, if a certain amount of a HAP (or combination of HAP) is emitted from the source. (See 112(a)(1).) By contrast, EPA is required to list categories or subcategories of area sources only if they meet one of the following statutory criteria: (1) EPA determines that the category of area sources presents a threat of adverse effects to human health or the environment that warrants regulation under CAA section 112; or (2) the category of area sources falls within the purview of CAA section 112(k)(3)(B) (the Urban Area Source Strategy). (See CAA 112(c)(3).)

For those source categories regulated under section 112, the next step concerns the establishment of emission standards. Under section 112(d), EPA must establish emission standards that ''require the maximum degree of reduction in emissions of the hazardous air pollutants subject to this section'' that the Administrator determines is achievable based on technology, taking into account certain factors such as cost, energy requirements, and other impacts. The emission standard for new sources cannot be, however, less stringent than the level of control achieved by the best controlled similar source, and the emission standard for existing sources cannot be less stringent than the average emission limitation achieved by the best performing 12 percent of existing sources in the category, regardless of cost, energy requirements and other impacts. CAA 112(d)(2) and (3). Finally, within eight years after promulgation of section 112(d) emission standards for a listed source category, EPA must promulgate additional standards if such standards are necessary to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect. (See CAA section 112(f).) These additional standards under CAA section 112(f) are commonly referred to as ''residual risk'' standards.

The criteria for listing major and area sources established in section 112(c)(1) and (c)(3) do not apply to Utility Units because Congress treated Utility Units differently from other major and area sources. Indeed, Congress enacted a special provision for Utility Units in section 112(n)(1)(A), which governs whether Utility Units should even be regulated under section 112.[4] Section 112(n)(1)(A) directs EPA to conduct a study to evaluate what ''hazards to public health [are] reasonably anticipated to occur'' as the result of HAP emissions from Utility Units ''after imposition of the requirements of th[e] Act,'' (emphasis added) and to report the results of such study to Congress by November 15, 1993. Congress also directed EPA to describe in the report to Congress ''alternative control strategies for [those] emissions that may warrant regulation under this section.'' (See CAA section 112(n)(1)(A).) Section 112(n)(1)(A) further provides that EPA shall regulate Utility Units under section 112 if the Administrator determines, considering the results of the study, that such regulation is ''appropriate and necessary.'' Thus, unlike other major and area sources, Congress first required EPA to examine how ''imposition of the requirements of th[e] Act'' would affect the overall level of utility HAP emissions, and then determine whether regulation of Utility Units under section 112 is both appropriate and necessary. Section 112(n)(1)(A) therefore sets an important and unique condition precedent for regulating Utility Units under section 112 and provides EPA discretion in determining whether that condition precedent has been met.

II. Regulatory Background

A. EPA's December 20, 2000 Regulatory Finding

On December 20, 2000, EPA issued a finding pursuant to CAA section 112(n)(1)(A) that it was appropriate and necessary to regulate coal- and oil-fired Utility Units under section 112. In making that finding, EPA considered the Utility Study, which was completed and submitted to Congress in February 1998.

In the Utility Study, we divided Utility Units into three subcategories based on fuel type: coal-, oil-, and gas-fired units. We then analyzed HAP emissions from each subcategory. We followed this approach because each subcategory burns a different fuel, which, in turn, leads to different emissions profiles, which can require different emission controls. This approach is also consistent with EPA's historical practice of subcategorizing Utility Units based on fuel type. (*See, e.g.,* 40 CFR 60.44(a).)

Because EPA subcategorized Utility Units for purposes of the Utility Study, EPA, in December 2000, made separate ''appropriate and necessary'' findings under section 112(n)(1)(A) for gas-fired, coal-fired, and oil-fired Utility Units. In making these findings, EPA considered the Utility Study and certain additional information obtained after completion of the Utility Study, including the National Academy of Sciences' report concerning the health effects of methylmercury and actual emissions data obtained in response to an information collection request EPA issued to all coal-fired Utility Units in 1999. *See* 65 FR 79826. EPA reasonably relied on this additional information because the information provided a more comprehensive and contemporaneous record concerning Hg emissions from coal-fired units. Nothing in section 112(n)(1)(A) suggests that Congress sought to preclude EPA from considering more current information in making the appropriate and necessary finding.

In the December 2000 finding, EPA determined that it was appropriate and necessary to regulate coal- and oil-fired units, but not gas-fired units.[5] With respect to the latter, EPA found that regulation of HAP emissions from natural gas-fired Utility Units ''is not appropriate or necessary because the *impacts due to HAP emissions from such units are negligible based on the results of the study documented in the utility RTC.*'' (Emphasis added) *See* 65 FR 79831.

EPA provided three primary reasons in support of its finding that it was ''appropriate'' to regulate coal- and oil-fired Utility Units under section 112. First, EPA found that it was appropriate to regulate HAP emissions from coal- and oil-fired Utility Units because Utility Units ''are the largest domestic source of Hg emissions.'' *See* 65 FR 79830. EPA next found that it was

[3] EPA published the initial list on July 16, 1992. See 57 FR 31,576, July 16, 1992. EPA did not include Utility Units on the initial section 112(c) list because Congress required EPA to conduct and consider the results of the study required by section 112(n)(1)(A) before regulating these units and, therefore, listing in 1992 was not authorized by statute.

[4] No one would dispute that certain Utility Units would meet the definition of a ''major source'' based on the quantity of HAP emitted from such units, or that other Utility Units may meet the ''area source'' criteria for listing under section 112(c)(3), but Congress recognized this fact in 1990 and specifically enacted section 112(n)(1)(A), which establishes an entirely different test for determining whether Utility Units should be regulated under section 112.

[5] Although the December 2000 finding addressed three subcategories of Utility Units—coal-, oil-, and gas-fired units, the majority of the finding concerned Hg emissions from coal-fired power plants. 65 FR 79826–29 (explaining that Hg from coal-fired units is the HAP of greatest concern); Utility Study, ES–27 (''mercury from coal-fired utilities is the HAP of greatest potential concern.'').

appropriate to regulate coal- and oil-fired Utility Units because ''mercury in the environment presents significant hazards to public health and the environment.'' [6] *See* 65 FR 79830. Finally, EPA explained that it was appropriate to regulate HAP emissions from coal- and oil-fired units because it had identified certain control options that, it anticipated, would effectively reduce HAP from such units. In discussing the appropriate finding, EPA also noted that uncertainties remained concerning the extent of the public health impact from HAP emissions from oil-fired units. Thus, EPA's determination that it was ''appropriate'' to regulate coal- and oil-fired units under section 112 hinged on the health effects associated with Hg emissions from coal-fired Utility Units, the uncertainties associated with the health effects of HAP from oil-fired Utility Units, and EPA's belief that control options would be available to reduce certain utility HAP emissions.[7]

Once EPA determined that it was ''appropriate'' to regulate coal- and oil-fired Utility Units under section 112 of the CAA, EPA next concluded that it was also ''necessary'' to regulate HAP emissions from such units under section 112. Interpreting the term ''necessary'' in section 112(n)(1)(A), EPA found that it was necessary to regulate HAP from coal- and oil-fired Utility Units ''because the implementation of other requirements under the CAA will not adequately address the serious public health and environmental hazards arising from such emissions identified in the Utility RTC.'' *See* 65 FR 79830.

In light of the positive appropriate and necessary determination, EPA in December 2000 listed coal- and oil-fired Utility Units on the section 112(c) source category list. *See* 65 FR 79831 (our finding that it is appropriate and necessary to regulate coal- and oil-fired Utility Units under section 112 ''adds these units to the list of source categories under section 112(c).''). Relying on CAA section 112(e)(4), EPA explained in its December 2000 finding that neither the appropriate and necessary finding under section 112(n)(1)(A), nor the associated listing were subject to judicial review at that time. EPA did not add natural-gas fired units to the section 112(c) list in December 2000 because it did not make a positive appropriate and necessary finding for such units.

B. Litigation Challenging December 2000 Regulatory Finding

Shortly after issuance of the December 2000 Finding, an industry group challenged the December 2000 finding in the United States Court of Appeals for the District of Columbia Circuit (DC Circuit). *UARG* v. *EPA,* 2001 WL 936363, No. 01–1074 (DC Cir. July 26, 2001). EPA moved to dismiss the lawsuit on the basis of section 112(e)(4), which provides, in pertinent part, that ''no action of the Administrator * * * listing a source category or subcategory under subsection (c) of this section *shall be a final agency action subject to judicial review,* except that any such action may be reviewed under such section 7607 of this title when the Administrator issues emission standards for such pollutant or category.'' (Emphasis added.) (*See* CAA Section 112(e)(4).)

In its motion to dismiss the petition, EPA argued to the DC Circuit, among other things, that the December 2000 listing of coal- and oil-fired Utility Units was inseparable from the appropriate and necessary finding and that the appropriate and necessary finding and listing actions are not final agency actions pursuant to section 112(e)(4). *See also* 65 FR 79826. EPA further noted in its motion to dismiss that both the finding and the listing would be subject to additional notice and comment as part of the section 112(d) rulemaking. *See* EPA's Motion to Dismiss, *UARG* v. *EPA*, 2001 WL 936363, No. 01–1074S (''Because the decision to add coal and oil fired electric utility steam generating units to the source category list is not yet final agency action, it will be among the matters subject to further comment in the subsequent [standards] rulemaking.''); 65 FR 79831 (noting that issues related to the listing, such as ''the exact dimension of the source category,'' will be subject to additional comment in the emission standard rulemaking process). The DC Circuit dismissed the challenge to the December 2000 finding for lack of jurisdiction based on section 112(e)(4) of the CAA. The December 2000 finding and associated listing are therefore not final agency actions.

C. January 30, 2004 Proposed Rule and March 2004 Supplemental Notice

On January 30, 2004, EPA published in the **Federal Register** a proposed rule entitled ''Proposed National Emissions Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units.'' (*See* 69 FR 4652 (January 30, 2004).) In that rule, EPA proposed three alternative regulatory approaches. First, EPA proposed to retain the December 2000 Finding and associated listing of coal- and oil-fired Utility Units and to issue under section 112(d) maximum achievable control technology-based (MACT) emission standards for both subcategories. Second, EPA alternatively proposed revising the Agency's December 2000 Finding, removing coal and oil-fired Utility Units from the section 112(c) list,[8] and issuing final standards of performance under CAA section 111 for new and existing coal-fired units that emit Hg and new and existing oil-fired units that emit nickel. Finally, as a third alternative, EPA proposed retaining the December 2000 finding, removing coal and oil-fired Utility Units from the section 112(c) list, and regulating Hg emissions from Utility Units under CAA section 112(n)(1)(A).

Shortly thereafter, on March 16, 2004, EPA published in the **Federal Register** a supplemental notice of proposed rulemaking entitled ''Supplemental Notice of Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units.'' *See* 69 FR 13298 (March 16, 2004). In that

[6] Section IV below addresses our conclusion that it is not appropriate and necessary to regulate coal- and oil-fired Utility Units under section 112 and explains why we now believe that our December 2000 finding lacked foundation. As explained below, one of the reasons the December 2000 ''appropriate'' finding for oil-fired Utility Units lacks foundation is because the record that was before the Agency in December 2000 establishes that Hg is a HAP of concern only as emitted from coal-fired units, not oil-fired units. Utility Study ES–5,13,27. EPA therefore should not have relied upon Hg emissions as a basis for finding it was appropriate to regulate oil-fired units under section 112. (*See, e.g.,* Utility Study ES–5, ES–27.)

[7] The ''appropriate'' finding for oil-fired units stemmed primarily from EPA's concerns over the potential health effects of nickel from such units. As explained in the January 2004 proposed rule, the record before the Agency in December 2000 supported a distinction between nickel and the other HAP emitted from oil-fired units. *See* 69 FR 4688. We proposed that this distinction was reasonable based on the relative amount of nickel emitted from oil-fired units and the health effects associated with such emissions. (See also Utility Study at ES–12 (noting higher population concentrations surrounding oil-fired units). At the time of the proposed rule, we recognized, however, the uncertainties in the data underlying our ''appropriate'' finding for oil-fired units based on nickel emissions, and for that reason solicited information as to whether nickel emissions from oil-fired plants currently pose a hazard to public health.

[8] We did not propose revising the December 2000 finding for gas-fired Utility Units because EPA continues to believe that regulation of such units under section 112 is not appropriate and necessary. We have not received any information that would cause us to change our conclusion in this regard. In fact, the information that we have received since the Utility Study only confirms the conclusion we reached in December 2000. We therefore take no action today with regard to the December 2000 finding for gas-fired Utility Units.

notice, EPA proposed certain additional regulatory text, which largely governed the proposed section 111 standards of performance for Hg, which included a cap-and-trade program. The supplemental notice also proposed state plan approvability criteria and a model cap-and-trade rule for Hg emissions from coal-fired Utility Units. The Agency received thousands of comments on the proposed rule and supplemental notice.[9] Comments relating to the central issues concerning today's action are addressed in this preamble. The remainder of our responses are contained in the response to comments document which is in the docket.[10]

D. The December 2004 Notice of Data Availability

On December 1, 2004, EPA published in the **Federal Register** a notice of data availability entitled ''Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources, Electric Utility Steam Generating Units: Notice of Data Availability.'' *See* 69 FR 69864 (December 1, 2004). EPA issued this notice to seek additional information and input concerning: (1) Certain Hg data and information that the Agency received in response to the proposed rule and supplemental notice, (2) the different forms of Hg that are emitted into the atmosphere from coal-fired Utility Units and how those forms respond to different control technologies; and (3) a revised proposed benefits methodology for assessing the benefits of Hg regulation. The benefits methodology generally involves analyzing Hg emissions from coal-fired Utility Units, conducting deposition modeling based on the identified Hg emissions, and relating that deposition modeling to methylmercury concentrations in fish. EPA conducts benefits analyses for rulemakings consistent with the provisions of Executive Order 12866.

[9] We initially estimated that we had over 680,000 submissions from the public on the proposed rule and the supplemental notice, which came primarily in the form of letters and e-mails. A recent review of the electronic docket reveals that our initial estimate was over-stated. The docket reflects approximately 500,000 separate submissions from the public, about 5,000 of which represent unique comments.

[10] The response to comments document relevant to this rule is called: ''Response to Significant Public Comments Concerning the Proposed Revision of the December 2000 Appropriate and Necessary Finding and Proposed Removal of Utility Units From the Section 112(c) List.''

III. EPA's Interpretation of CAA Section 112(n)(1)(A)

As explained above, Congress treated Utility Units differently from other major and area sources and provided EPA considerable discretion in evaluating whether to regulate Utility Units under section 112. Section 112(n)(1)(A) provides, in full:

> The Administrator shall perform a study of the *hazards to public health reasonably anticipated to occur as a result of emissions by electric utility steam generating units* of pollutants listed under subsection (b) of this section after imposition of the requirements of this Act. The Administrator shall report the results of this study to the Congress within 3 years after the date of the enactment of the Clean Air Act Amendments of 1990. The Administrator shall develop and describe in the Administrator's report to Congress alternative control strategies for emissions which may warrant regulation under this section. The Administrator shall regulate electric utility steam generating units under this section, if the Administrator finds such regulation is *appropriate and necessary after considering the results* of the study required by this subparagraph. (Emphasis added.).

The italicized terms in the above paragraph are central terms in section 112(n)(1)(A). Before we address our interpretation of these terms, however, we again summarize the requirements of section 112(n)(1)(A). The first step under section 112(n)(1)(A), which is addressed by the first three sentences of section 112(n)(1)(A), concerns the completion of a study and submission of the results of that study to Congress by November 15, 1993. The study is to examine the hazards to public health from utility HAP emissions that are reasonably anticipated to occur following imposition of the requirements of the CAA and to identify alternative control strategies for those HAP that may warrant regulation under section 112. The second step, which is addressed by the last sentence of section 112(n)(1)(A), requires EPA to determine whether regulation of Utility Units under section 112 is appropriate and necessary considering, among other things, the results of the study. Congress provided no deadline by which this determination must be made.

Section 112(n)(1)(A) itself contains no clear standard to govern EPA's analysis and determination of whether it is ''appropriate and necessary'' to regulate utilities under section 112. The first sentence of the subparagraph describes the scope of the study EPA was to conduct. The sentence on EPA's ''appropriate and necessary'' finding then says that the Agency must make that finding after considering the results of the study. But Congress did not supply an actual definition or test for determining whether regulation of utilities under section 112 is ''appropriate and necessary.'' Thus, EPA must supply a reasonable interpretation of those terms to fill the gap. *Chevron USA Inc.* v. *NRDC*, 467 U.S. 837 (1984).

Congress' direction on the study provides the only guidance in section 112(n)(1)(A) about the substance of EPA's inquiry. Because the statute provides no other explicit guidance, EPA has chosen to extrapolate from Congress' description of the study to adopt a reasonable interpretation of the phrase ''appropriate and necessary.'' The following sections describe how the Agency has used Congress' guidance on the study to formulate different aspects of our interpretation and application of the ''appropriate and necessary'' test.

A. Hazards to Public Health Reasonably Anticipated To Occur

In section 112(n)(1)(A), Congress directed EPA to perform a study of ''hazards to public health'' that would likely result from utility HAP emissions, before making any further decisions about regulating utilities under section 112. Unlike other sections of the CAA, section 112(n)(1)(A) focuses only on hazards to public health. It does not require that EPA study other factors, such as environmental effects without any established pathways to human health effects. In contrast, section 112(n)(1)(B) requires a separate EPA study, although not as a precursor to a regulatory determination, of the ''health and environmental effects'' of ''mercury emissions'' from a broad range of sources. Also unlike Section 112(n)(1)(A), many of the other requirements of section 112 explicitly require both an assessment of human health effects and, in addition, an assessment of adverse environmental effects. For example, the Administrator is charged with periodically reviewing the list of Hazardous Air Pollutants and adding pollutants that present a threat of either ''adverse human health effects'' or ''adverse environmental effects.'' CAA Section 112(b)(2). The Administrator examines area sources of HAPs to determine if they present ''a threat of adverse effects to human health or the environment.'' CAA Section 112(c)(3). The Administrator is to prioritize action under section 112(d) after considering ''the known or anticipated adverse effects of such pollutants on public health and environment.'' CAA Section 112(e)(2)(A). Nor did Congress appear to view the two terms as synonymous. Under section 112(f), the EPA

promulgates emission standards at a level ''with an ample margin of safety'' to ''protect public health.'' CAA Section 112(f)(2)(A). The Administrator may go further and impose more stringent standards to protect against ''an adverse environmental effect'' only after considering ''cost, energy, safety, and other relevant factors.'' *Id.*

As described above, section 112(n)(1)(A) also provides no clear standard for analyzing public health effects—in contrast to, for example, section 112(f). Under section 112(f), the issue is whether additional regulation is needed to ''provide an ample margin of safety to protect public health.'' Section 112(f) also expressly incorporates EPA's pre-1990 two-part inquiry for evaluating what level of emission reduction is needed to provide an ample margin of safety to protect public health. See CAA section 112(f)(2)(B) (incorporating EPA's two-part ample margin of safety inquiry, set forth at 54 FR 38044 September 14, 1989, which implemented the requirements of section 112 of the 1977 CAA).[11] By contrast, section 112(n)(1)(A) neither includes the ''ample margin of safety to protect public health'' requirement, nor does it incorporate EPA's pre-1990 ample margin of safety inquiry.

Because of the focus on ''public health'' in the section 112(n)(1)(A) study requirement, and because as discussed above Congress did not define the scope of the ''appropriate and necessary'' finding, EPA is reasonably interpreting section 112(n)(1)(A) to base that finding on an assessment of whether utility HAP emissions likely would result in ''hazards to public health.''

Moreover, EPA reasonably interprets section 112(n)(1)(A) not to require the Agency either to study or to base its ''appropriate and necessary'' finding on an assessment of environmental effects unrelated to public health.

As described above, Section 112(n)(1)(A) requires only that the Administrator ''consider'' the results of the public health study before determining whether utility regulation is ''appropriate and necessary.'' This mild direction, when paired with the considerable discretion inherent in any judgment about whether an action is ''appropriate and necessary,'' has led EPA to conclude that the statute permits the agency to consider other relevant factors when determining whether to regulate emissions from utility units under section 112. This is not to say, however, that EPA believes it may ignore the context of section 112(n) in making its determination.

The Supreme Court has recognized that ''where Congress includes particular language in one section of a statute but omits it in another section of the same Act,'' as here, where section 112(n)(1)(A) refers to public health and conspicuously omits any reference to adverse environmental effect, ''it is generally presumed that Congress acts intentionally * * * in the disparate inclusion or exclusion.'' *Russello* v. *United States,* 464 U.S. 16, 23 (1983). The only direction that Congress explicitly provided to guide our ''appropriate and necessary'' finding was that we consider the results of a study of only those ''hazards to public health'' that the agency ''reasonably anticipate[s] to occur.''

EPA must reconcile the broad discretion to determine what is ''appropriate and necessary'' with the implicit Congressional decision that information about environmental effects unrelated to human health effects was not needed for that determination. Rather than conclude that EPA is prohibited from considering environmental effects, however, EPA interprets section 112(n)(1)(A) to permit the agency to consider other relevant factors as part of its ''appropriate and necessary'' determination, as refined further below, but these factors may not independently, or in conjunction with one another, justify regulation under section 112(n) when EPA has concluded that hazards to U.S. public health are not reasonably anticipated to occur. Compare CAA section 112(f)(2)(A) (Administrator may set a more stringent standard than is required to protect health if necessary, considering factors such as cost, to prevent an adverse environmental effect).

In evaluating hazards to public health under section 112(n)(1)(A) we look at various factors, including, for example, the affected population, the characteristics of exposure (*e.g.,* level and duration), the nature of the data, including the uncertainties associated with the data, and the nature and degree of health effects. In terms of assessing health effects, we have numerous tools at our disposal. See Section VI.H (for fuller discussion of factors relevant to assessing the hazards to public health). For example, for cancer effects, we can assess the lifetime excess cancer risk, and for other effects, we look to tools, such as the reference dose.[12] As explained below, the ''hazards to public health reasonably anticipated to occur'' standard is relevant not only for the Study, but also for the appropriate and necessary determination.

EPA has also taken note of the context for assessing ''hazards to public health,'' for the language of section 112(n)(1)(A), calls for an analysis of the ''hazards to public health'' reasonably anticipated to ''occur as a result of emissions by electric utility steam generating units.'' (Emphasis added.) Section 110(a)(2)(D) provides an instructive comparison in this regard. In section 110(a)(2)(D), Congress required that each state implementation plan contain adequate provisions ''prohibiting * * * any source or other type of emissions activity within the State from emitting any air pollutant in amounts'' that will ''contribute significantly to nonattainment'' of the national ambient air quality standards. This provision demonstrates that Congress knew how to require regulation of emissions of air pollutants even where the pollutants themselves do not cause a problem, but rather only ''contribute to a problem.'' Unlike section 110(a)(2)(D), in section 112(n)(1)(A), Congress focused exclusively on the ''hazards to public health'' of HAP emissions ''result[ing] from'' Utility Units. Rather, it is the EPA study performed pursuant to section 112(n)(1)(B), not the inquiry under section 112(n)(1)(A), that examines all current anthopogenic sources of Hg emissions and their effects on human health and the environment. EPA has concluded that its inquiry under section 112(n)(1)(A) may reasonably focus solely on whether the utility HAP emissions themselves are posing a hazard to public health. This focus on utility emissions only is consistent with Congress' overall decision to provide for separate treatment of utilities in section 112(n)(1)(A).

B. Imposition of the Requirements of This Act

Congress required EPA to examine the hazards to public health from utility emissions ''after imposition of the requirements of this Act.'' The phrase ''imposition of the requirements of th[e] Act'' is susceptible to different

[11] Section 112 of the 1977 CAA directed EPA to promulgate emission standards ''at the level which in * * * [the Administrator's judgment] provides an ample margin of safety to protect the public health.'' Congress substantially amended section 112 in 1990 and enacted several new provisions. Congress specifically incorporated the ''ample margin of safety to protect public health'' requirement into section 112(f), which applies to any source category that is regulated under section 112(d)(2) and (d)(3). Significantly, Congress did not include the ''ample margin of safety'' language in section 112(n)(1)(A). Instead, Congress directed EPA to assess the ''hazards to public health reasonably anticipated to occur'' from utility HAP emissions after imposition of the requirements of the CAA, and then determine whether Utility unit emissions should be regulated under section 112 of the CAA.

[12] Section VI below discusses the reference dose (''RfD'') in detail.

interpretations because Congress did not specify the scope of the requirements under the CAA to be considered or, more importantly, the time period over which the imposition of requirements was to be examined. EPA reasonably interprets the phrase ''imposition of the requirements of th[e] Act'' to include not only those requirements already imposed and in effect, but also those requirements that EPA reasonably anticipates will be implemented and will result in reductions of utility HAP emissions. This interpretation is reasonable in view of the fact that Congress called for the study to be completed within three years of enactment of the 1990 CAA Amendments. At such time, EPA could have only forecast, to the extent possible, how implementation of the requirements of the CAA would impact utility HAP emissions, based on the science and the state of technology at the time.[13]

We are interpreting the phrase ''requirements of th[e] Act'' broadly to include CAA requirements that could either directly or indirectly result in reductions of utility HAP emissions. For example, certain provisions of the CAA that affect Utility Units, such as the requirements of Title I and Title IV, require controls on pollutants like SO_2 or NO_X. Although these pollutants are not HAP, the controls that are required to achieve the needed reductions have the added effect of reducing HAP emissions. Thus, given our interpretation of the phrase ''imposition of the requirements of th[e] Act,'' we read the first sentence of section 112(n)(1)(A) as calling for a study of the hazards to public health from utility HAP emissions that EPA reasonably anticipates would occur after implementation of the CAA requirements that EPA, at the time of the study, should have reasonably anticipated would be implemented and would directly or indirectly result in reductions of utility HAP emissions.

Finally, it is telling that Congress directed EPA to examine the utility HAP emissions remaining ''after imposition of the requirements of th[e] Act,'' because there is no other provision in section 112 that calls for EPA to examine the requirements of the CAA in assessing whether to regulate a source category under section 112.[14] Congress plainly treated Utility Units differently from other source categories, and that special treatment reveals Congress' recognition that Utility Units are a broad, diverse source category that is subject to numerous CAA requirements, including requirements under both Title I and Title IV, and that such sources should not be subject to duplicative or otherwise inefficient regulation.[15] See 136 Cong. Rec. H12911, 12934 (daily ed. Oct. 26, 1990) (Statement of Congressman Oxley) (stating that the conferees adopted section 112(n)(1)(A) ''because of the logic of basing any decision to regulate on the results of scientific study and because of the emission reductions that will be achieved and the extremely high costs that electric utilities will face under other provisions of the new Clean Air Act amendments.'').

C. Appropriate and Necessary After Considering the Results of the Study

Section 112(n)(1)(A) requires EPA to make a determination as to whether regulation of Utility Units under section 112 is ''appropriate and necessary.'' Congress did not define the terms ''appropriate'' and ''necessary,'' but provided that regulation of Utility Units under section 112 could occur only if EPA determines that such regulation is both ''appropriate'' and ''necessary.''

1. Considering the Results of the Study

The appropriate and necessary determination is to be made only after ''considering the results of the study'' required under section 112(n)(1)(A). We interpret the phrase ''considering the results of the study'' to mean that EPA must consider the results of the study in making its determination, but that EPA is not foreclosed from analyzing other relevant information that becomes available after completion of the study. This interpretation is reasonable because section 112(n)(1)(A) contains no deadline by which EPA must determine whether it is ''appropriate and necessary'' to regulate Utility Units under section 112.

Moreover, nothing in section 112(n)(1)(A) suggests that EPA is precluded from considering new relevant information obtained after completion of the Utility Study in determining whether regulation of Utility Units under section 112 is appropriate and necessary. Indeed, the term ''considering'' in section 112(n)(1)(A) is analogous to the terms ''based on'' or ''including,'' which are neither limiting nor exclusive terms.[16] In a recent case, the DC Circuit rejected an argument advanced by the petitioners that an EPA rule was invalid because the statute required EPA to promulgate the regulation ''based on the study,'' and according to petitioners EPA's rule was not based on a study that met the requirements of the CAA. *Sierra Club* v. *EPA*, 325 F.3d 374 (DC Cir. 2003). In rejecting petitioners' arguments, the Court held, among other things, that ''the statute doesn't say that the rule must be based exclusively on the study.'' *Sierra Club* v. *EPA*, 325 F.3d at 377 (emphasis in original); See also *United States* v. *United Technologies Corp.*, 985 F.2d 1148, 1158 (2d Cir. 1993) (''based upon'' does not mean ''solely''); *McDaniel* v. *Chevron Corp.*, 203 F.3d 1099, 1111 (9th Cir. 2000). Consistent with this reasoning, EPA reasonably interprets the phrase ''considering the results of the study,'' to mean that EPA must consider the study, but that it can consider other relevant information obtained after completion of the study. Congress could not have reasonably intended for EPA to

[13] Although the December 2000 finding does not provide an interpretation of the phrase ''after imposition of the requirements of the[e] Act,'' the Utility Study, on which that finding was based, does account for the phrase by evaluating utility HAP emission levels in 2010. See Utility Study ES–2 (the ''2010 scenario was selected to meet the section 112(n)(1)(A) mandate to evaluate hazards 'after imposition of the requirements of 'the CAA.''). We do not believe that the December 2000 finding or the January 2004 proposal properly give effect to all of the terms of section 112(n)(1)(A), including the first sentence of section 112(n)(1)(A). We therefore provide our interpretation of the central terms in that sentence above, as those terms are relevant to the final actions we are taking today.

[14] Section 112(m)(6) provides an instructive comparison because it requires EPA to examine the other provisions of section 112, and to determine whether those provisions are adequate to prevent serious adverse effects to public health and the environment associated with atmospheric deposition to certain waterbodies. Section 112(m)(6) also requires EPA to promulgate additional regulations setting emission standards or control requirements, ''in accordance with'' section 112 and under the authority of section 112(m)(6), if EPA determines that the other provisions of section 112 are adequate, and such regulations are appropriate and necessary to prevent serious adverse public health and environmental effects. Section 112(n)(1)(A) provides EPA far greater discretion because under that section, EPA is not only to evaluate the reasonably anticipated public health hazards remaining ''after imposition of the requirements of th[e] Act,'' but also to determine whether to regulate Utility Units under section 112 of the CAA at all.

[15] As noted elsewhere, section 112(n)(1)(A) was included in the House Committee bill and adopted by the House; while the Senate included a different provision. In the Conference Committee, the House version prevailed. Sen. Durenberger, a Senate conferee and an evident opponent of the provision, alluded to another purpose for the provision, which concerns the fact that ''mercury is a global problem.'' Legislative History of the Clean Air Act Amendments of 1990, at 872 (Oct. 27, 1990) (statement of Sen. Durenberger). Based on Sen. Durenberger's statement, it appears that one of the reasons for the wide deference Congress accorded EPA under section 112(n)(1)(A) was to allow EPA to account for the fact that Hg emissions from U.S. utilities are a very small part of overall Hg emissions, and therefore that EPA should exercise discretion in considering the uncontrollable amount of risk from Hg that would remain regardless of the extent to which U.S. utilities are controlled.

[16] In fact, the term ''considering,'' on its face, is less limiting than the phrase ''based on.''

ignore relevant information concerning HAP emissions from Utility Units solely because that information was obtained after completion of the Utility Study.[17]

2. Appropriate and Necessary

The condition precedent for regulating Utility Units under section 112 is whether such regulation is ''appropriate'' and ''necessary.'' These are two very commonly used terms in the English language, and Congress has not ascribed any particular meaning to these terms in the CAA. The legislative history does not resolve Congress' intent with regard to these terms. We therefore first examine the structure of section 112(n)(1)(A) and then discuss our interpretation of the terms ''appropriate'' and ''necessary.''

a. Examining the Structure of Section 112(n)(1)(A). In interpreting the terms ''appropriate'' and ''necessary'' in section 112(n)(1)(A), we begin with the structure of section 112(n)(1)(A). As an initial matter, the order of the terms in the phrase ''appropriate and necessary'' suggests that the first decision EPA must make is whether regulation of Utility Units under section 112 is ''appropriate.'' Even if EPA determines that regulation of Utility Units under section 112 is appropriate, it must still determine whether such regulation is also necessary. Were EPA to find, however, that regulation of Utility Units under section 112 met only one prong, then regulating Utility Units under section 112 would not be authorized by the statute.

The structure of section 112(n)(1)(A) also reveals that the appropriate and necessary finding is to be made by reference to the reasonably anticipated public health risks of utility HAP emissions that remain after ''imposition of the requirements of th[e] Act.'' The first sentence of section 112(n)(1)(A) contains an important direction to EPA, which sets the predicate for the entire provision. That first sentence calls for EPA to identify the hazards to public health reasonably anticipated to occur as a result of the utility HAP emissions remaining ''after imposition of the requirements of th[e] Act.'' Stated differently, Congress wanted EPA to identify the utility HAP emissions that would remain ''after imposition of the requirements of th[e] Act'' and identify the hazards to public health reasonably anticipated to occur as the result of such emissions. As noted above, we interpret the phrase ''imposition of the requirements of th[e] Act'' to include those CAA requirements that EPA should have reasonably anticipated would be implemented and would result in reductions of utility HAP emissions.[18] Congress' focus on the other requirements of the CAA reflects its recognition that Utility Units are subject to numerous CAA provisions and its intent to avoid duplicative and unnecessary regulation. We therefore reasonably conclude that the appropriate and necessary finding is to be made by reference to the reasonably anticipated public health risks from utility HAP emissions that remain ''after imposition of the requirements of th[e] Act.''

b. EPA's interpretations of the terms ''appropriate'' and ''necessary.'' (i) Appropriate. In December 2000, EPA found that it was appropriate to regulate coal- and oil-fired Utility Units under section 112. At that time, we did not provide an interpretation of the term ''appropriate.'' Instead, we focused on the following facts and circumstances. We first found that it was ''appropriate'' to regulate coal- and oil-fired Utility Units under section 112 because ''mercury in the environment presents significant hazards to public health.'' *See* 65 FR 79830. We also determined that it was appropriate to regulate oil-fired Utility Units based on the uncertainties ''regarding the extent of the public health impact from HAP emissions from'' such units. *See* 65 FR 79830. Finally, we found that it was appropriate to regulate HAP emissions from coal-and oil-fired units under section 112 because we had identified control options that we anticipated would effectively reduce certain HAP emissions. We also indicated that certain control options could ''greatly reduc[e] mercury control costs.'' *See* 65 FR 79830.

In January 2004, we proposed reversing our ''appropriate'' finding in large part. Specifically, we proposed that it is not ''appropriate'' to regulate coal-fired units on the basis of non-Hg HAP and oil-fired units on the basis of non-Ni HAP because the record that was before the Agency in December 2000 indicates that emissions of such pollutants do not result in hazards to public health. *See* Section IV.B.

Webster's dictionary defines the term ''appropriate'' to mean ''especially suitable or compatible.'' Miriam-Webster's Online Dictionary, 10th ed. Determining whether something is ''especially suitable or compatible'' for a particular situation requires consideration of different factors. In section 112(n)(1)(A), Congress requires EPA to determine whether it is ''appropriate'' to regulate Utility Units under section 112. In making this determination, we begin as we did in December 2000, by assessing the paramount factor, which is whether the level of utility HAP emissions remaining ''after imposition of the requirements of th[e] Act'' would result in hazards to public health. We determine whether the remaining utility HAP emissions cause hazards to public health by analyzing available health effects data and assessing, among other things, the uncertainties associated with those data, the weight of the scientific evidence, and the extent and nature of the health effects. See Section VI. If the remaining HAP emissions from Utility Units do not result in hazards to public health, EPA does not believe that it would be ''especially suitable''—*i.e.*, ''appropriate''—to regulate such units under section 112. In this situation, there would be no need to consider any additional factors under the ''appropriate'' inquiry because the threshold fact critical to making a finding that it is appropriate to regulate Utility Units under section 112 would be missing.

Even if the remaining utility HAP emissions cause hazards to public health, it still may not be appropriate to regulate Utility Units under section 112 because there may be other relevant factors particular to the situation that would lead the Agency to conclude that it is not ''especially suitable'' or ''appropriate'' to regulate Utility Units under section 112. For example, it might not be appropriate to regulate the utility HAP emissions remaining ''after imposition of the requirements of th[e] Act,'' if the controls mandated under section 112(d) would be ineffective at eliminating or reducing the identified hazards to public health. Similarly, it might not be appropriate to regulate the

[17] Consistent with this interpretation, in December 2000, EPA relied not only on the Utility Study, but also on certain information concerning Hg obtained after completion of the study, including actual emissions data from coal-fired plants for calendar year 1999 and a report from the National Academy of Sciences on the health effects of methylmercury. See 65 FR 79825–27.

[18] The comments of Rep. Oxley, a member of the Conference Committee, about section 112(n)(1)(A) support EPA's interpretation of that provision. Rep. Oxley stated:

> Pursuant to section 112(n), the Administrator may regulate fossil fuel fired electric utility steam generating units only if the studies described in section 112(n) clearly establish that emissions of any pollutant, or aggregate of pollutants, from such units cause a significant risk of serious adverse effects on the public health. Thus, if the Administrator regulates any of these units, he may regulate only those units that he determines—*after taking into account compliance with all other provisions of the CAA* and any other federal, state or local regulation and voluntary emission reductions—have been demonstrated to cause a significant threat of adverse effects on public health.

136 Cong. Rec. H12911, 12934 (daily ed. Oct. 26, 1990) (Statement of Rep. Oxley) (emphasis added).

remaining utility HAP emissions under section 112 if the health benefits expected as the result of such regulation are marginal and the cost of such regulation is significant and therefore substantially outweighs the benefits. These examples illustrate that situation-specific factors, including cost, may affect whether it ''is appropriate'' to regulate utility HAP emissions under section 112.[19] (See Section 112(n)(1)(A).)

It cannot be disputed that Congress under section 112(n)(1)(A) entrusted EPA to exercise judgment by evaluating whether regulation of Utility Units under section 112 is, in fact, ''appropriate.'' We believe that in exercising that judgment, we have the discretion to examine all relevant facts and circumstances, including any special circumstances that may lead us to determine that regulation of Utility Units under CAA section 112 is not appropriate.[20]

(ii) Necessary. Like the ''appropriate'' finding, the ''necessary'' finding must be made by reference to the utility HAP emissions remaining after imposition of the requirements of the CAA.

Specifically, we interpret the term ''necessary'' in section 112(n)(1)(A) to mean that it is necessary to regulate Utility Units under section 112 only if there are no other authorities available under the CAA that would, if implemented, effectively address the remaining HAP emissions from Utility Units. Assessing whether an alternative authority would effectively address the remaining utility HAP emissions would involve not only: (a) An analysis of whether the alternative legal authority, if implemented, would address the identified hazards to public health, which was a concept specifically addressed in December 2000 and in the January 2004 proposal, but also (b) an analysis of whether the alternative legal authority, if implemented, would result in effective regulation, including, for example, its cost-effectiveness and its administrative effectiveness. See *Michigan* v. *EPA*, 213 F.3d, 663, 678 (addressing consideration of costs).

This interpretation of the term ''necessary'' differs slightly from the interpretation advanced in December 2000 and January 2004. In December 2000 and January 2004, we interpreted the term ''necessary'' to mean that it is only necessary to regulate Utility Units under section 112 if there are no other authorities under the CAA that would adequately address utility HAP emissions. Several commenters noted that under this interpretation, EPA could never regulate HAP under section 112 if it identified an alternative viable legal authority. In light of these comments and further review of section 112(n)(1)(A), we refined our interpretation of the term ''necessary'' as noted above. We agree that if we found an alternative authority under the CAA but we also determined that such authority would not effectively address the remaining HAP emissions, we should be able to address those emissions under section 112. Accordingly, we maintain that it is necessary to regulate Utility Units under section 112 only if there are no other authorities under the CAA that, if implemented, would effectively address the remaining HAP emissions from Utility Units.

Some commenters argued that the ''appropriate and necessary'' finding is a public health threshold finding, not an investigation into whether another provision of the CAA would address HAP emissions from utilities. This argument is without merit, however, because it conflates the terms ''appropriate'' and ''necessary'' and renders one term mere surplusage. Congress required EPA to determine whether it was both appropriate and necessary to regulate Utility Units under section 112. EPA agrees that it must evaluate the hazards to public health associated with HAP from utilities in terms of assessing whether regulation under section 112 is ''appropriate.'' But Congress meant something different by the term ''necessary,'' and EPA's interpretation of that term is reasonable. Moreover, we believe that the emissions inquiry envisioned under the first sentence of section 112(n)(1)(A) is distinct from the ''necessary'' inquiry called for by the last sentence of section 112(n)(1)(A), because under the ''necessary'' inquiry the issue is not whether EPA reasonably anticipated that a particular provision of the CAA will be implemented and will reduce HAP emissions, but rather whether there are any other authorities in the CAA that could be implemented, and if implemented, could effectively address the hazards to public health that result from the remaining HAP emissions.

Other commenters argued that EPA cannot consider other statutory authorities under the ''necessary'' prong of the ''appropriate and necessary'' inquiry because those authorities do not provide for regulation of utility HAP according to the provisions of CAA section 112(d) and (f). This argument is also without merit because it again renders mere surplusage the ''necessary'' prong of the determination. Moreover, as explained above, Congress did not incorporate the requirements of section 112(f) into section 112(n)(1)(A), but instead, as we interpret section 112(n)(1)(A), called on EPA to consider the ''hazards to public health reasonably anticipated to occur'' from utility HAP emissions after imposition of the requirements of the CAA, in determining whether it is both appropriate and necessary to regulate Utility Units under section 112.

3. The Timing and Nature of the ''Appropriate and Necessary'' Determination

Congress set no deadline in section 112(n)(1)(A) by which EPA must determine whether regulation of Utility Units is appropriate and necessary. We believe that Congress provided

[19] Nothing precludes EPA from considering costs in assessing whether regulation of Utility Units under section 112 is appropriate in light of all of the facts and circumstances presented. The DC Circuit has indicated that regulatory provisions should be read with a presumption in favor of considering costs: ''It is only where there is 'clear congressional intent to preclude consideration of cost' that we find agencies barred from considering costs. [Citations omitted.]'' *Michigan* v. *EPA*, 213 F.3d 663, 678 (DC Cir. 2000), cert. den., 532 U.S. 903 (2001) (upholding EPA's interpretation of ''contribute significantly'' under CAA section 110(a)(2)(D) to include a cost component). The Supreme Court's decision in *Whitman* v. *American Trucking Assn's (ATA)*, Inc., 531 U.S. 457 (2001), is not to the contrary. In that case, the Court held that EPA lacked authority to consider costs in the context of setting the national ambient air quality standards under CAA section 109(b)(1), because the ''modest words 'adequate margin' and 'requisite' '' in that section do not ''leave room'' to consider cost. 531 U.S. 466. By contrast, EPA is not setting emission standards in today's action, but rather determining, as Congress directed, whether it is ''appropriate'' and ''necessary'' to regulate Utility Units under CAA section 112. The terms ''appropriate'' and ''necessary'' are broad terms, which by contrast to the terms at issue in ATA do, in fact, leave room for consideration of costs in deciding whether to regulate utilities under section 112. Moreover, the legislative history of section 112(n) indicates that Congress intended for EPA to consider costs. See 136 Cong. Rec. H12911, 12934 (daily ed. Oct. 26, 1990) (statement of Rep. Oxley) (''[T]he conference committee produced a utility air toxics provision that will provide ample protection of the public health while avoiding the imposition of excessive and unnecessary costs on residential, industrial and commercial consumers of electricity.''). Finally, section 112(n)(1)(A) requires EPA to consider alternative control strategies, and the focus on such strategies may reasonably be read as further evidence of the relevance of costs. *See, e.g.*, 65 FR 79830 (discussing costs in relation to certain technologies).

[20] Significantly, in December 2000, we acknowledged that factors other than the hazards to public health resulting from utility HAP emissions should be examined in determining whether regulation of Utility Units is appropriate under section 112. Indeed, after concluding that the Hg emissions from coal-fired Utility Units caused hazards to public health, we proceeded with the appropriate inquiry and examined whether there were any control technologies that could effectively reduce Hg. We also commented on the costs of achieving such reductions. *See, e.g.*, 65 FR 79828, 79830.

sufficient discretion under section 112(n)(1)(A)—in terms of both the substance and the timing of the appropriate and necessary finding—that nothing precludes us from revising our appropriate and necessary finding if we determine either that the finding was in error based on information before the Agency at the time of the finding, or that the finding is incorrect given new information concerning utility HAP emissions obtained after issuance of the finding. Both of these situations are present here, as explained in section IV below.

Moreover, EPA reasonably interprets the last sentence of section 112(n)(1)(A) as authorizing EPA to issue separate appropriate and necessary findings for different subcategories of ''electric utility steam generating units.'' EPA typically subcategorizes large source categories such as utilities. This is especially true for Utility Units because the nature of the fuel used in different units (*e.g.,* coal-, oil-, or gas-fired Utility Units), affects the type and amount of HAP emitted from the units, which, in turn, affects the issue of whether hazards to public health may exist from such emissions.[21] Even where section 112(n)(1)(A) read to require EPA to make only one appropriate and necessary finding for all ''electric utility steam generating units,'' EPA's conclusions, as described below, would remain the same.

IV. Revision of the December 2000 Appropriate and Necessary Finding

In Section II above, we summarize the December 2000 appropriate and necessary finding for coal- and oil-fired Utility Units. In this section, we explain why we now believe that the December 2000 finding lacked foundation and therefore was erroneous. We also address below certain new information obtained since the finding that confirms that it is not appropriate and necessary to regulate coal- and oil-fired Utility Units under section 112. Our discussion below is divided into two sections, the first of which concerns the December 2000 finding for coal-fired units, and the second of which addresses the December 2000 finding for oil-fired units.

A. Revision of the December 2000 Appropriate and Necessary Finding for Coal-fired Units

The majority of the December 2000 finding concerned Hg emissions from coal-fired Utility Units. *See, e.g.*, 65 FR 79826 (''mercury * * * is emitted from coal-fired units, and * * * is the HAP of greatest concern to public health from the industry.''); 65 FR 79829–30 (conclusions section of December 2000 finding focuses almost exclusively on Hg); Utility Study, ES–27 (''mercury from coal-fired utilities is the HAP of greatest potential concern.''). For that reason, we first address how EPA erred in making the appropriate and necessary finding for coal-fired units based on Hg emissions. We then discuss the December 2000 finding for coal-fired units with regard to non-Hg HAP.

1. It Is Not Appropriate and Necessary To Regulate Coal-Fired Units on the Basis of Hg Emissions

a. It Is Not Appropriate to Regulate Coal-fired Units on the Basis of Hg Emissions. As noted above, EPA's December 2000 ''appropriate'' finding is framed primarily in terms of health effects resulting from Hg emissions from coal-fired Utility Units.[22] *See* 65 FR 79829. The December 2000 finding also discusses environmental effects, primarily in the context of public health. In particular, the appropriate finding discusses the effects of Hg on fish because the public's primary route of exposure to Hg is through consumption of fish containing methylmercury. *See* 65 FR 79829–30. *See also* Section VI (discussing health effects of Hg). The December 2000 finding also discusses briefly the effects of methymercury on certain fish-eating wildlife, such as racoons and loons. See 65 FR 79830.

As explained above, EPA interprets section 112(n)(1)(A) as not requiring the Agency to consider environmental effects of utility HAP emissions that are unrelated to public health. Nevertheless, EPA believes it has authority under the ''appropriate'' inquiry to consider other factors, including non-public health related environmental factors. As explained above, however, given the focus in section 112(n)(1)(A) on hazards to public health, we believe that environmental factors unrelated to public health, although they can be considered in the appropriate inquiry, may not independently or, in conjunction with one another, justify regulation of Utility Units under section 112 when EPA has concluded that hazards to public health are not reasonably anticipated to result from utility HAP emissions.

EPA reasonably addressed non-public health related environmental factors, such as exposure to wildlife, in the December 2000 finding, because we separately concluded that Hg emissions from coal-fired Utility Units pose hazards to public health. As explained below, we believe that our December 2000 appropriate finding lacks foundation, and that conclusion is supported by certain recent information. Specifically, we conclude today that the level of Hg emissions remaining after imposition of the requirements of the Act will not cause hazards to public health, and therefore we need not consider other factors, such as non-public health related environmental effects. We do, of course, discuss the effects of Hg on fish, because the ingestion of fish contaminated with methylmercury is the public's primary route of exposure to Hg. See Section VI (discussing health effects of Hg).[23]

As noted above, EPA's December 2000 appropriate finding for coal-fired units hinged primarily on the health and environmental effects resulting from Hg emissions. *See* 65 FR 79830 (''mercury in the environment presents significant hazards to public health and the environment.''). This finding lacks foundation, however, for the reasons described below.

(i) The December 2000 Appropriate Finding Is Overbroad To The Extent It Hinged On Environmental Effects. EPA should not have made its appropriate

[21] We received no adverse comments concerning our subcategorization of Utility Units for purposes of section 112(n)(1)(A).

[22] The ''appropriate'' rationale set forth in the December 2000 finding focused exclusively on Hg with regard to coal-fired Utility Units. The December 2000 ''necessary'' finding can be read, however, to suggest that under the appropriate prong, EPA also determined that non-Hg from coal-fired Utility Units resulted in hazards to public health. See 65 FR 79830 (''*It is necessary to regulate HAP emissions from coal- and oil-fired*'' Utility Units under section 112 ''because the implementation of other requirements of the CAA will not address the serious public health and environmental hazards arising from such emissions.''). As explained below in section IV.B, the record that was before the Agency in December 2000 confirms that the non-Hg HAP emissions remaining ''after imposition of the requirements of th[e] Act'' do not result in hazards to public health. In the proposed rule, EPA solicited comment on this issue. We did not receive any new information concerning non-Hg HAP during the comment period that would cause us to change our position as to these HAP.

[23] We note, however, that as part of our overall inquiry into the effects of Hg emissions, we assessed the available information on the environmental effects of Hg emissions, including effects that appear to be unrelated to public health. See 1997 Mercury Report to Congress. While that information, in a very general sense, suggests that environmental effects of Hg emissions (unrelated to public health) may be of some concern and therefore warrant further study, the available information is not specific to the effects of Hg emissions from domestic utilities. See RIA Appendix C. Thus, even if EPA were either required or permitted to give unlimited consideration to these non-health-related environmental effects of utility Hg emissions in making the regulatory determination under section 112(n)(1)(A), we would conclude that there is insufficient causal information to conclusively link utility emissions to deleterious effects (in wildlife) from Hg exposure.

finding because of ''hazards to * * * the environment'' resulting from Hg emissions from coal-fired Utility Units. Section 112(n)(1)(A) requires EPA to analyze only the ''hazards to public health'' resulting from utility HAP emissions, not the environmental effects caused by such emissions. Under section 112(n)(1)(A), the condition precedent for regulation under section 112 is public health hazards, not environmental effects, which Congress included in other provisions of section 112. *See, e.g.*, 112(c)(3) (''a threat of adverse effect to human health or the environment.''). The Supreme Court has recognized that ''where Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally * * * in the disparate inclusion or exclusion.'' *Russello* v. *United States,* 464 U.S. 16, 23 (1983). Accordingly, EPA erred in its December 2000 ''appropriate'' finding to the extent that it hinged on the environmental effects of HAP, including Hg.

(ii) The December 2000 Appropriate Finding Lacks Foundation Because EPA Did Not Fully Consider The Hg Reductions That Would Result From ''Imposition of the Requirements of th[e] Act.'' As explained above, EPA interprets section 112(n)(1)(A) as providing that the ''appropriate'' finding should be made by reference to the level of HAP emissions remaining after ''imposition of the requirements of th[e] Act.'' We reasonably interpret the phrase ''imposition of the requirements of th[e] Act'' to include those requirements that EPA should have reasonably anticipated would be implemented and would result in reductions of utility HAP emissions.

The December 2000 ''appropriate'' finding lacks foundation because EPA failed to fully account for the Hg emissions remaining after ''imposition of the requirements of th[e] Act.'' [24] That failure resulted in an overestimate of the remaining utility Hg emissions, which is the level of emissions that we considered in making our December 2000 appropriate finding. Had we properly considered the Hg reductions remaining ''after imposition of the requirements of th[e] Act'' in December 2000, we might well have (and, as discussed below, now believe should have) reached a different conclusion as to whether it was ''appropriate'' to regulate coal-fired units on the basis of Hg emissions.

We begin our analysis with a brief background concerning the Utility Study. In an attempt to address the requirement in section 112(n)(1)(A) of evaluating utility emissions ''after imposition of the requirements of th[e] Act'', the Utility Study estimates utility HAP emissions as of the year 2010. See Utility Study ES–1. In quantifying 2010 utility HAP emissions, our analysis focused almost exclusively on the acid rain provisions of Title IV. Title IV of the CAA establishes a national, annual emissions cap for sulfur dioxide (SO_2) emissions from Utility Units, which is to be implemented in two phases. Phase I commences January 1, 1995, and Phase II on January 1, 2000.

EPA relied in the Utility Study on a 1997 Department of Energy report concerning the effects of the implementation of Title IV of the CAA on utilities. Utility Study 2–31 to 2–33, 2–39. That report provides that 53 percent of Utility Units subject to Phase 1 requirements switched to a lower-sulfur coal, 27 percent purchased additional emissions allowances, and 16 percent (*i.e.,* 27 Utility Units) installed flue gas scrubbers to comply with the Phase I requirements.[25] In the 2010 utility HAP emissions analysis, EPA accounted for the 27 Utility Units that installed scrubbers to comply with the phase I requirements. Utility Study 2–31. EPA accounted for these scrubbers in the 2010 analysis because it recognized that scrubbers, which control SO_2, achieve HAP reductions, including Hg.[26] Utility Study at ES–19 & 25, 1–2, 2–32, 3–14 (discussing ability of PM controls (including SO_2 controls) to reduce Hg and other HAP emissions from Utility Units).[27] Significantly, however, EPA did not incorporate into the 2010 utility HAP emissions analysis the Hg reductions that we reasonably should have anticipated achieving through implementation of the requirements of Title I of the CAA. See Utility Study, at 2–31 to 2–33. In this regard, EPA erred in, at least, two respects.

First, EPA erred by not accounting for the utility Hg reductions that it should have reasonably anticipated would result from implementation of the nonattainment provisions of Title I, including, in particular, the revised NAAQS for ozone that EPA issued in July 1997, before the report was completed, under the nonattainment provisions.[28] The Utility Study expressly recognizes that the revised NAAQS would result in, among other things, significant reductions of SO_2 and NO_X. See generally Utility Study at 1–2 to 1–3. The Utility Study also indicates that the revised NAAQS would result in approximately a 16 percent reduction (11 tons per year) of Hg emissions by 2010, primarily due to the fact that Utility Units would need to install controls, like scrubbers, to meet the SO_2 reductions needed to attain the PM NAAQS. (Utility Study 1–3, ES–25, 3–14). Notwithstanding these significant estimated reductions, EPA did not take these reductions into account in its 2010 utility HAP emissions analysis.[29] ES–25 (''analyses performed to assess compliance with the revised NAAQS * * * indicate that Hg emissions in 2010 may be reduced by approximately 16 percent (11 tpy) *over those projected in this report.*''). Accordingly, the December 2000 appropriate finding lacks foundation because we made the finding based on an inaccurate level of Hg emissions remaining after imposition of the requirements of the CAA. Had we properly accounted in December 2000 for the 11 tons per year of Hg reductions that we projected in our own analyses, we might well have (and, as discussed below, now believe should have) concluded that it was not appropriate to regulate coal-fired units under section

[24] For ease of reference, we refer to the level of utility Hg emissions remaining ''after imposition of the requirements'' of the CAA as the ''remaining Hg emissions.''

[25] Flue gas scrubbers are a type of control technology used to control SO_2.

[26] EPA did not account in its 2010 analysis for the installation of any scrubbers associated with Phase II of the acid rain program, because it only had industry projections as to which units would install scrubbers and, for various reasons, it did not find those projections reliable. Utility Study 2–31 to 2–33.

[27] In the December 2000 finding, we indicate that recent data show that technologies used to control criteria pollutants, like PM, SO_2, and NO_X are not ''effective'' in controlling Hg. See 65 FR 79828. This statement is incorrect. It is not only inconsistent with other statements in the December 2000 finding, it is contrary to the record that was before the Agency in December 2000. The record indicates that technologies used to control PM, SO_2, and NO_X do reduce HAP, including Hg. Furthermore, insofar as Hg is concerned, these technologies result in important reductions of oxidized Hg, which is the type of Hg that tends to deposit locally and regionally. Utility Study at ES–19 & 25, 1–2, 2–32, 3–14.

[28] For additional background concerning the nonattainment provisions of Title I and the revised PM and ozone NAAQS, see Section V below.

[29] In the Utility Study, we explained that we did not account for the identified Hg reductions in the 2010 analysis because we lacked information on the specific number of units that would install scrubbers and related PM control technologies since we had not yet designated which areas of the country were in nonattainment of the revised NAAQS. See Utility Study 2–32. Although we had not yet designated areas of the country as being in nonattainment of the revised standards, as explained in section V, we were generally aware of the likelihood of widespread nonattainment with the revised NAAQS. In fact, that recognition formed the basis of our analysis that resulted in an estimated 16 percent reduction in Hg emissions from implementation of the revised NAAQS.

112 on the basis of the remaining Hg emissions. Indeed, recent modeling confirms that we likely would have reached such a conclusion. That modeling specifically demonstrates that about a 13 ton reduction in utility Hg emissions from 1990 levels would result in a level of Hg emissions that does not cause hazards to public health. We conducted these recent analyses in conjunction with the recently signed Clean Air Interstate Rule (''CAIR'') issued pursuant to CAA section 110(a)(2)(D), which is explained more fully in section V below.

Second, EPA erred in December 2000 by not examining, and therefore not accounting for, the reductions in utility Hg emissions that would result from two other rules issued pursuant to Title I of the CAA. The first rule set new source performance standards (''NSPS'') under CAA section 111(b) for NO_X emitted from utility and industrial boilers. The second rule, promulgated under CAA section 110(a)(2)(D), requires 22 states and the District of Columbia to revise their state implementation plans (''SIP'') to mitigate for the interstate transport of ozone. This rule is called the NO_X SIP-call rule and requires significant reductions of NO_X emissions in the eastern half of the United States. EPA determined those NO_X reductions by analyzing Utility Units and large nonpoint utility sources and identifying the amount of reductions that those units could achieve in a ''highly cost-effective'' manner. Both the NO_X SIP call and the NSPS rule were premised on a NO_X control technology called selective catalytic reduction (''SCR''). The data on the effectiveness of SCR at controlling utility Hg emissions was limited in February 1998. See Utility Study 2–32. As of December 2000, however, EPA had additional data that confirmed that SCR would lead to certain reductions in utility Hg emissions. *See, e.g.,* 65 FR 79829 (SCR—a NO_X control technology ''may also oxidize mercury and therefore enhance mercury control.''). EPA therefore should have been able to reasonably estimate in December 2000 that some Hg reductions would occur as the result of implementation of the NSPS and the NO_X SIP-call rules. Because we did not account for reductions in utility Hg emissions as the result of implementation of these rules, we made our appropriate finding in December 2000 based on an incorrect estimate of the remaining Hg utility emissions. Based on all of the above, the December 2000 ''appropriate'' finding lacked foundation because it was not based on the level of utility Hg emissions remaining ''after imposition of the requirements of th[e] Act.''

(iii) It Is Not Appropriate to Regulate Coal-fired Utility Units Under Section 112 on the Basis of Hg Emissions Because New Information Reveals that the Level of Utility Hg Emissions Remaining After Imposition of the Requirements of the CAA Does Not Cause Hazards to Public Health. In addition to the errors noted above with regard to the December 2000 finding, we have new information that confirms that it is not appropriate to regulate coal-fired units under section 112 on the basis of Hg emissions. EPA recently signed a rulemaking implementing section 110(a)(2)(D), called the Clean Air Interstate Rule. (See Section V below for further discussion of CAIR.) This rulemaking, among other things, requires a number of eastern states to develop SIPs providing for substantial reductions of SO_2 and NO_X emissions. Although affected states retain flexibility to decide how to achieve those reductions, EPA has concluded that the reductions from Utility Units are highly cost-effective, and anticipates that affected states will meet their emission reduction obligations by controlling Utility Unit emissions. EPA also concluded that the technologies that most cost-effectively achieve SO_2 and NO_X reductions for Utility Units are scrubbers for SO_2 and SCR for NO_X. These technologies, as noted above, result in reductions of utility Hg emissions. In conjunction with the CAIR rulemaking, EPA analyzed the nature of Hg emissions that would remain after implementation of the rule and assumed that states would choose to regulate Utility Units, which is the most cost-effective option for achieving the required reductions. That modeling reveals that the implementation of section 110(a)(2)(D), through CAIR, would result in a level of Hg emissions from Utility Units that would not cause hazards to public health. See Section V for further detail. Because this new information demonstrates that the level of Hg emissions projected to remain ''after imposition of'' section 110(a)(2)(D) does not cause hazards to public health, we conclude that it is not appropriate to regulate coal-fired Utility Units under section 112 on the basis of Hg emissions.[30]

In addition to CAIR, we today finalized a rule pursuant to section 111, called the Clean Air Mercury Rule (''CAMR''). (See section VII below for further discussion of CAMR.) That rule requires even greater reductions in Hg emissions from coal-fired Utility Units than CAIR. As explained in greater detail in Section VI, the computer modeling completed in support of that rule, like the modeling completed on CAIR, demonstrates that CAMR, independent of CAIR, will result in levels of utility Hg emissions that do not result in hazards to public health. Thus, the implementation of CAMR provides an independent basis for our conclusion that it is not appropriate to regulate coal-fired Utility Units under section 112 because the utility Hg emissions remaining after implementation of section 111 will be at a level that results in no hazards to public health.[31]

b. It Is Not Necessary to Regulate Coal-fired Units on the Basis of Hg Emissions. Even if Congress had intended EPA to focus on a more limited set of requirements in interpreting the phrase ''after imposition of the requirements of th[e] Act,'' that would mean only that EPA did not err in December 2000 in terms of its ''appropriate'' finding for coal-fired units based on Hg emissions. EPA nevertheless concludes today that it still erred in December 2000 with regard to its ''necessary'' finding. In section 112(n)(1)(A), Congress called on EPA to make a finding as to whether regulation of Utility Units under section 112 was not only ''appropriate,'' but ''necessary.'' To give effect to the term ''necessary,'' we interpret the ''necessary'' prong of the section 112(n)(1)(A) inquiry to require EPA to examine whether there are any other available authorities under the CAA that, if implemented, would effectively address the remaining Hg emissions from coal-fired Utility Units.

[30] The reductions achieved through CAIR overlap, in part, with the 11 tons per year of reductions discussed in the prior section, which EPA estimated in 1998 would occur as the result of implementation of the revised NAAQS. The reductions necessarily overlap because in the Utility Study EPA projected forward 13 years, by examining utility HAP emissions in 2010. In analyzing the level of utility Hg emissions remaining ''after imposition of [section 110(a)(2)(D)]'' through CAIR, we are accounting for the full impact of CAIR and that necessarily includes reductions that occur between today and 2010, and beyond. See Section V (discussing requirements of CAIR in 2010 and 2015).

[31] Nothing in section 112(n)(1)(A) precludes EPA from revising a prior appropriate and necessary finding based on new information. In light of CAIR and, independently, CAMR, we can now reasonably anticipate the reductions in utility Hg emissions that would result from implementation of sections 110(a)(2)(D) and 111 of the CAA. Accordingly, we are accounting for those reductions in assessing the level of utility Hg emissions remaining after ''imposition of the requirements of th[e] Act,'' which include section 110(a)(2)(D) and 111. We then based our new appropriate finding on these remaining Hg emissions.

In December 2000, EPA did not consider CAA sections 110(a)(2)(D) [32] and 111,[33] which are viable alternative authorities under the CAA, that, if implemented, would effectively address the remaining utility Hg emissions. See Section VI below. Regulation under these authorities would effectively address the remaining utility Hg emissions for two primary reasons. First, as demonstrated in section VI below, the level of utility Hg emissions remaining after implementation of CAIR will not result in hazards to public health. Similarly, as shown in section VI below, the CAMR, which requires even greater Hg reductions than CAIR, will, once implemented, result in a level of utility Hg emissions that does not cause hazards to public health.

In addition, controlling Hg emissions through a cap-and-trade system—whether that control is through direct regulation under section 111 or indirect regulation under section 110(a)(2)(D)—is an efficient means of regulating Utility Units. See CAMR final rule (signed on March 15, 2005) (discussing basis and purpose of the regulations). As an initial matter, a cap-and-trade system, as opposed to the control regime imposed pursuant to section 112(d), provides Utility Units the flexibility to pursue a least-cost compliance option to achieve the required emissions reductions.

Sources have the choice of complying with the reductions in a variety of ways, such as fuel switching, installing different pollution control technologies, installing new or emerging control technologies and/or buying allowances to emit from another source that has controlled its emissions to a level below what the regulation requires. This compliance flexibility allows Utility Units to respond to changing electricity generation demands, economic market conditions or unanticipated weather situations (*e.g.*, extremely hot or cold periods) without jeopardizing their compliance status, or the stability of the overall cap. In addition, the certainty provided by the emissions cap and the timeline for declining emissions provide important information for industry to make strategic, long-range business decisions.

Moreover, under a cap-and-trade approach, most of the reductions are projected to result from larger units installing controls and selling excess allowances, due to economies of scale realized on the larger units versus the smaller units. Indeed, EPA's modeling of trading programs demonstrates that large coal-fired Utility Units, which tend to have higher levels of Hg emissions, will achieve the most cost-effective emission reductions. These units are more likely to over-control their emissions and sell allowances, than to not control and purchase allowances. This model prediction is consistent with principles of capital investment in the utility industry. Under a trading system where the firm's access to capital is limited, where the up-front capital costs of control equipment are significant, and where emission-removal effectiveness (measured in percentage of removal) is unrelated to plant size, from an economics standpoint, the utility company is more likely to allocate pollution-prevention capital to its larger facilities than to the smaller plants (since more allowances will be earned from the larger facilities). Economies of scale of pollution control investment will also favor investment at the larger plants. Further, insofar as large coal-fired Utility Units tend to be newer and/or better maintained than medium-sized and small facilities, it can be expected that companies will favor investments in plants with a longer expected lifetime. These modeled predictions are consistent with the pattern of behavior that EPA has observed over the past decade through implementation of the SO_2 emissions trading program under Title IV of the CAA. Thus, under a cap-and-trade program, Hg reductions result from units that are most cost effective to control, which enables those units that are not considered to have cost effective control alternatives to use other mechanisms for compliance, such as buying allowances. By contrast, regulating pursuant to a control regime like section 112(d) does not result in the cost efficiencies that are attendant a cap-and-trade program. For example, under section 112(d), each facility must meet a specific level of emission control, which can result in increased compliance costs, particularly for the smaller Utility Units given economies of scale.

Finally, trading provides greater incentives for the development and adoption of new technologies, which could lead to a greater level of emissions control. See generally 69 FR 4686–87. An additional benefit of the cap-and-trade programs under sections 110(a)(2)(D) and 111 is that they dovetail well with each other. In particular, the coordinated regulation of SO_2, NO_X, and Hg through CAIR and CAMR improves the cost effective manner of regulation because the reductions are being achieved simultaneously using in some cases the same technology to control more than one pollutant. In addition, the cap-and-trade programs under sections 110(a)(2)(D) complement other cap-and-trade programs that directly affect Utility Units, such as the NO_X SIP-call final rule and the regulations implementing Title IV, which only further enhances the efficiencies of emission control from such units.

In light of CAA sections 110(a)(2)(D) and 111, we believe that we should not have concluded in December 2000 that it ''is necessary'' to regulate Utility Units under section 112 and therefore our ''necessary'' finding was in error. Moreover, even setting aside the error that we made in December 2000, we now recognize the availability of these other statutory provisions and we further conclude today that it is not necessary to regulate coal-fired Utility Units under section 112 on the basis of the remaining Hg emissions. CAA section 110(a)(2)(D), as implemented through CAIR, and independently section 111, as implemented through CAMR, will effectively address the Hg emissions remaining from coal-fired Utility Units ''after imposition of the requirements of th[e] Act.''

In sections V and VII below, we address sections 110(a)(2)(D) and 111 and provide a thorough discussion of the legal authority under each provision. We also explain in Section VI that after implementation of CAIR, and independently, CAMR, we do not anticipate hazards to public health resulting from Hg emissions from coal-fired Utility Units.

[32] In January 2004, the proposed section 111 rule was premised, in part, on the reductions in Hg emissions that EPA anticipated would be achieved through CAIR. In response to comments received on the CAMR, we conducted additional modeling that confirmed that CAIR alone, once implemented, would result in levels of utility Hg emissions that do not cause hazards to public health. (See Section VI below). Accordingly, we now believe that CAA section 110()(2)(D) constitutes yet another viable authority under the CAA that, once implemented, will effectively address the remaining utility Hg emissions.

[33] In the Utility Study, we considered section 111 of the CAA, noting that ''new source performance standards currently provide the major regulatory authority for the control of air emissions from utilities.'' Utility Study 1–6. We recognized that we had issued NSPS for PM for Utility Units and we noted that such requirements would result indirectly in the control of certain HAP, including Hg. EPA did not, however, address in the Utility Study the question of whether HAP from utilities could be regulated under the authority of section 111 [Utility Study 1–5–6]. As explained in the proposed rule, we conducted a thorough re-evaluation of the provisions of the CAA and have concluded that section 111 provides authority to regulate HAP from new and existing Utility Units. See Section VII below (discussing legal authority under section 111).

2. It Is Not Appropriate and Necessary to Regulate Coal-Fired Units on the Basis of Non-Hg Emissions

In the study required by section 112(n)(1)(A), and detailed in the Utility Study, EPA identified 67 HAP as potentially being emitted by Utility Units. (Utility Study, ES–4). Based on a screening assessment designed to prioritize HAP for further evaluation, EPA identified 14 HAP as a priority for further evaluation. (Id.). Of the 14 HAP identified for further evaluation, 12 HAP (arsenic, beryllium, cadmium, chromium, manganese, nickel, hydrogen chloride, hydrogen fluoride, acrolein, dioxins, formaldehyde and radionuclides) were identified for further study based on potential for inhalation exposure and risks. (Utility Study, ES–6). Four of those 12 HAP (arsenic, cadmium, dioxins and radionuclides) plus Hg and lead were considered priority for multipathway exposure. (*Id.*). Of those six HAP, four (arsenic, Hg, dioxins and radionuclides) were identified as the highest priority to assess for multipathway exposure and risks. (Utility Study, ES–6, 7). The other 53 HAP were not evaluated beyond the screening assessment. (Utility Study, ES–7).

In evaluating the potential for inhalation exposure and risks for the 12 HAP identified through the screening assessment as priority for that purpose, EPA estimated the high-end inhalation cancer risk for each HAP identified as a carcinogen and the high-end inhalation noncancer risks for the remaining HAP for both coal- and oil-fired Utility Units in 2010. (Utility Study, 6–16, tables 6–8 and 6–9). That evaluation indicated that there was no maximum individual risk (MIR) for cancer greater than 1×10^{-6} for beryllium, cadmium, dioxin and nickel emissions from coal-fired Utility Units and for beryllium, cadmium and dioxin emissions from oil-fired Utility Units. (*Id.*) With regard to dioxins, the Utility Study specifically concluded that the quantitative exposure and risk results did not conclusively demonstrate the existence of health risks of concern associated with inhalation exposures to utility emissions on a national scale or from any actual individual utility. (Utility Study, 11–5). The Utility Study thus indicates that inhalation of beryllium, cadmium and dioxin emissions from coal and oil-fired Utility Units and emissions of nickel from oil-fired Utility Units are not of significant concern from a public health standpoint because such exposure does not present a maximum individual risk (MIR) for cancer greater than 1×10^{-6}. With regard to lead emissions, EPA found that emission quantities and inhalation risks were relatively low and, therefore, decided not to conduct future evaluations of multipathway exposures to lead resulting from Utility Unit emissions. (Utility Study, ES–24). For arsenic, EPA concluded that there were several uncertainties associated with both the cancer risk estimates and the health effects data such that further analyses were needed to characterize the inhalation risks posed by arsenic emissions from Utility Units. (Utility Study, ES–21). The inhalation exposure assessment did not identify any exceedances of the health benchmarks (*e.g.*, RfCs) for hydrogen chloride or hydrogen fluoride, thus indicating that Utility Unit emissions of those HAP did not pose a significant public health concern. (Utility Study chapters 6 and 9.)

a. It Is Not Appropriate to Regulate Coal-fired Units on the Basis of Non-mercury HAP Emissions. The EPA erred in the December 2000 Regulatory Determination to the extent that its ''appropriate'' finding for coal-fired Utility Units was based, in any way, on hazards to public health or the environment arising from emissions of non-mercury HAP from coal-fired Utility Units. Based on the information before it at the time, EPA could not have reasonably concluded that coal-fired Utility Unit non-mercury HAP emissions presented a hazard to public health. In addition, as stated above, EPA should not have considered environmental effects in the December 2000 Regulatory Determination's consideration of whether it was appropriate to regulate HAP emissions from coal-fired Utility Units under section 112.

(i) Non-Mercury Metallic HAP. In the December 2000 Regulatory Determination, EPA indicated that there were a few metallic HAP (*e.g.*, chromium and cadmium) which were of potential concern for carcinogenic effects, but stated that ''the results of the risk assessment (performed in conjunction with the Utility Study) indicate that cancer risks are not high''. (*See* 65 FR 79825, 79827.) The EPA acknowledged, however, that the cancer risks were not low enough to eliminate those metals as a potential concern for public health (*Id.*). This latter statement, at least as it pertains to cadmium, is at odds with the results of the risk assessment set forth in the Utility Study and discussed above. In the Utility Study, EPA determined that there was no maximum individual risk (MIR) for cancer greater than 1×10^{-6} due to inhalation of cadmium emissions from Utility Units. In the Proposed Rule, EPA stated that although it recognized the existence of uncertainties with regard to the data and information obtained prior to the December 2000 Regulatory Determination regarding potential hazards to public health resulting from Utility Unit emissions of non-mercury metallic HAP, the Agency believed that the uncertainties associated with those emissions were so great that it was not appropriate to regulate them at that time because they do not pose a hazard to public health that warrants regulation. (69 FR 4652, 4688, January 30, 2004). The EPA continues to believe that had it properly accounted for the uncertainties regarding the data and information on potential hazards to public health resulting from Utility Unit emissions of non-mercury metallic HAP in making the December 2000 appropriate finding it would have concluded that it was not appropriate to regulate such emissions because they do not cause a hazard to public health. The EPA has not discovered any new information on hazards to public health arising from such emissions that invalidates this conclusion, either through its own efforts or in response to the Proposed Rule.

(ii) Dioxins. In the December 2000 Regulatory Determination, EPA also identified dioxins as being of potential concern and indicated that they may be evaluated further during the regulatory development process. (*See* 65 FR 79825, 79827.) The EPA did not, however, indicate that those concerns rose to a level that warranted regulation of dioxins. Thus, EPA did not conclude, and could not have concluded, based on the record before it at the time of the December 2000 Regulatory Determination that it was appropriate to regulate coal-fired Utility Unit HAP emissions under section 112 of the CAA on the basis of dioxin emissions. In the Proposed Rule EPA stated that while it intended to continue to study dioxins in the future, the Utility Study and the information EPA had obtained since finalizing the Utility Study revealed no public health hazards reasonably anticipated to occur as a result of emissions of dioxins by Utility Units. (*See* 69 FR 4652, 4688). As is the case with non-mercury metallic HAP, EPA has neither discovered information on hazards to public health arising from Utility Unit emissions of dioxins based on its own efforts, nor received such information in response to the Proposed Rule. The EPA therefore concludes that its appropriate finding in December 2000 lacked foundation because it could not have reasonably concluded that the

level of remaining utility dioxin emissions results in hazards to public health.

(iii) Acid Gases. In the December 2000 Regulatory Determination, EPA identified emissions of hydrogen chloride and hydrogen fluoride as being of potential concern and indicated that such emissions may be evaluated further during the regulatory development process. (See 65 FR 79825, 79827.) The EPA did not, however, indicate that it believed that it was appropriate to regulate such emissions, under section 112 or otherwise. As indicated in the Proposed Rule, EPA did in fact further evaluate Utility Unit emissions of hydrogen chloride and hydrogen fluoride. (See 69 FR 4652, 4688, fn. 10; ''Modeling results for hydrogen chloride, hydrogen fluoride and chlorine emissions from coal-fired utility boilers'', December 12, 2003, OAR–2002–0056–0015). That modeling indicates that individuals are not exposed to acid gas emissions from Utility Units at concentrations which pose hazards to public health. EPA has neither discovered information on hazards to public health arising from Utility Unit emissions of acid gases based on its own efforts, nor received such information in response to the Proposed Rule. EPA therefore concludes that its appropriate finding in December 2000 lacked foundation because the level of remaining utility acid gas emissions does not result in hazards to public health.

For the reasons stated above, EPA finds that it could not reasonably have concluded that it was appropriate to regulate coal-fired Utility Units under section 112 due to emissions of non-mercury HAP based on the record before it at the time of the December 2000 Regulatory Determination. The EPA further finds that it has not itself discovered any information which would support the conclusion that it is appropriate to regulate non-mercury HAP emissions by coal-fired Utility Units under section 112 subsequent to the December 2000 Regulatory Determination, nor has it received any such information in response to the January 2004 Proposed Rule, the March 2004 Supplemental Notice or the December 2004 Notice of Data Availability. Further, EPA has concluded that it did not, and should not, rely on potential environmental effects alone in determining whether it was appropriate to regulate coal-fired Utility Units under section 112. The EPA, therefore, finds that, based on the record before it at the time, it was in error in determining that it was appropriate to regulate coal-fired Utility Unit HAP emissions under section 112 to the extent that the determination was based in any way on the hazards to public health of non-mercury HAP emissions or on environmental effects resulting from such emissions.

b. It Is Not Necessary to Regulate Coal-fired Units on the Basis of Non-Mercury HAP Emissions. In determining whether it is appropriate and necessary to regulate Utility Unit HAP emissions under section 112, the threshold question is whether it is appropriate to regulate such emissions at all. Where, as here, EPA cannot reasonably conclude that it is appropriate to regulate such emissions, the Agency does not need to resolve the question of whether it is necessary to regulate such emissions under section 112, or elsewhere. In any event, even if EPA could have reasonably concluded that it was appropriate to regulate non-mercury HAP emissions from coal-fired Utility Units, it would not have been reasonable for the Agency to find that it was necessary to regulate such emissions under section 112 since, as discussed above, it should have realized that there was an available alternative mechanism, such as section 111, for regulating such emissions had it been appropriate to do so. See also Section VII below.

B. Revision of the December 2000 Appropriate and Necessary Finding for Oil-fired Units

1. It Is Not Appropriate and Necessary To Regulate Oil-Fired Units on the Basis of Nickel Emission

a. It Is Not Appropriate to Regulate Oil-fired Units on the Basis of Nickel Emissions. In finding that the regulation of HAP emissions from oil-fired Utility Units was appropriate and necessary in its December 2000 Regulatory Determination, EPA did not clearly identify the basis for this finding beyond stating that there remained uncertainties regarding the extent of the public health impact from HAP emissions from oil-fired units and that those uncertainties led the Administrator to find that regulation of HAP emission from such units under section 112 is appropriate and necessary. (See 65 FR 79825, 79830). Table 1 in the 2000 determination does, however, indicate that nickel is the metallic HAP emitted in the largest quantities by oil-fired Utility Units and that some nickel compounds are carcinogenic. (See 65 FR 79825, 79828). It therefore appears that EPA's finding was based at least in part on its concerns regarding perceived hazards to public health arising from inhalation exposure to nickel emissions from oil-fired Utility Units. This is consistent with the Utility Study which, based on very conservative assumptions regarding the carcinogenicity of the nickel emitted by such units, identifies nickel as the HAP emitted by oil-fired Utility Units which poses the highest cancer maximum individual risk. (Utility Study, Table 6–3, p. 6–8). The Utility Study identifies 11 oil-fired utility plants as having emissions causing maximum individual risk of cancer greater than 10^{-6} based on nickel emissions (*Id.*)

In the Proposed Rule, EPA stated that it continued to believe that the record supports a distinction between the treatment of nickel emissions from oil-fired Utility Units and other non-nickel HAP emissions from such units. EPA proposed to conclude that it was not appropriate to regulate the non-Ni HAP. EPA also proposed to treat nickel from oil-fired units differently based on the amount of nickel emitted annually and the scope of adverse health effects (See 69 FR 4652, 4688). Based on its analysis of new information obtained in response to the Proposed Rule, EPA has determined that the distinction between nickel and the remaining HAP from oil-fired units cannot be supported. EPA finds that it is not appropriate to regulate nickel emissions from oil-fired Utility Units and that it is, therefore, not appropriate to regulate oil-fired Utility Units. This finding is based on the following: (1) The significant reductions in the total nationwide inventory of oil-fired Utility Units; and (2) the changing fuel mixtures being used at the remaining units.

Nickel emissions from oil-fired Utility Units have been substantially reduced since the 1998 Utility Report to Congress through a combination of unit closures and fuel switching. The 11 oil-fired plants identified in the Utility Study as having emissions causing a maximum individual risk of cancer greater than 10^{-6} based on nickel emissions were comprised of 42 individual units. Of those 42 units, 12 units have permanently ceased operation or are out of service. (OAR–2002–0056–2046 at pp. 12–13; OAR–2002–0056–5998). In addition, 6 of the original 42 units have reported to the U.S. Department of Energy (DOE) that their fuel mix now includes natural gas. Earlier reports did not show these units as using natural gas as a fuel. (OAR–2002–0056–5998). The use of natural gas as a part of their fuel mix would decrease the nickel emissions from these 6 units. Similarly, another 5 units report using a mix of natural gas and distillate oil (rather than residual oil) in

2003. (OAR–2002–0056–5998). Since distillate oil contains less nickel than the residual oil previously burned by these units, it is reasonable to assume that these units currently emit less nickel than was previously the case. Another 2 units now fire a residual oil/natural gas mixture and have limited their residual oil use through permit restrictions to no greater than 10 percent of the fuel consumption between April 1 and November 15, with natural gas being used for at least 90 percent of total fuel consumption. (OAR–2002–0056–2046 at p. 13). Finally, five units have effectively eliminated their nickel emissions since the Utility Study by switching to burning natural gas exclusively. (OAR–2002–0056–2046 at pp. 12–13; OAR–2002–0056–5998). Taken as a whole, these changes mean that 30 of the original 42 units identified in the Utility Study have taken steps to reduce or actually eliminate their nickel emissions. Of the original 11 plants identified in the Utility Study, only 2, both in Hawaii, have units for which actions that will result in reduced nickel emissions do not appear to have been taken. (OAR–2002–0056–6871) In addition to the closure of the 12 units identified as being of potential concern in the Utility Study, there has been a steady decrease in the number of oil-fired Utility Units generally over the past decade and this trend is likely to continue. In fact, the latest DOE/EIA projections (OAR–2002–0056–5999) estimate no new utility oil-fired generating capacity and decreasing existing oil-fired generating capacity through 2025, with an additional 29.2 gigawatts of combined oil- and natural gas-fired existing capacity being retired by 2025.

Based on the foregoing, EPA concludes that it is not appropriate to regulate oil-fired Utility Units under section 112 because we do not anticipate that the remaining level of utility nickel emissions will result in hazards to public health.

b. It Is Not Necessary to Regulate Oil-fired Units on the Basis of Nickel Emissions. Because EPA could not have reasonably found that it was appropriate to regulate nickel emissions from oil-fired Utility Units based on the record before it at the time of the December 2000 Regulatory Determination, it should not have made a finding that it was necessary to regulate such emissions. Information obtained in the course of the rulemaking since the Proposed Rule has confirmed this conclusion. In any event, even if EPA could have reasonably concluded that it was appropriate to regulate nickel emissions from oil-fired Utility Units, it would not have been reasonable for the Agency to find that it was necessary to regulate such emissions under section 112 since, as discussed above, it should have realized that there was an available alternative mechanism, section 111, for regulating such emissions had it been appropriate to do so. See also Section VII below.

2. It Is Not Appropriate and Necessary To Regulate Oil-Fired Units on the Basis of Non-Nickel HAP Emissions

a. It Is Not Appropriate to Regulate Oil-fired Units on the Basis of Non-nickel HAP Emissions. As is the case with emissions of nickel, the record before EPA at the time of the December 2000 Regulatory Determination does not reasonably support a finding that it is appropriate to regulate emissions of any other HAP from oil-fired Utility Units. In the December 2000 Regulatory Determination, EPA stated that there remain uncertainties regarding the extent of the public health impact from HAP emissions from oil-fired Utility Units and, on that basis, found that it was appropriate and necessary to regulate oil-fired Utility Units under section 112. (See 65 FR 79825, 79830.) The EPA neither identified the HAP concerning which there were uncertainties nor identified what those uncertainties were. EPA has neither discovered information on hazards to public health arising from the remaining non-nickel emissions of oil-fired Utility Units, nor received such information in response to the Proposed Rule. EPA therefore concludes that its appropriate finding in December 2000 lacked foundation because, given the level of remaining non-nickel HAP emissions from Utility Units, the Agency did not and does not have any information on the hazards to public health reasonably anticipated to occur. Indeed, the uncertainties that exist with regard to the data and information on these emissions are so great that the Agency has not identified any hazards to public health.

b. It Is Not Necessary to Regulate Oil-fired Units on the Basis of Non-nickel HAP Emissions. Because EPA finds that it is not appropriate to regulate oil-fired Utility Units on the basis of non-nickel HAP emissions, it also finds that it is not necessary to regulate oil-fired Utility Units on the basis of such emissions. In any event, even if EPA could have reasonably concluded that it was appropriate to regulate non-nickel HAP emissions from oil-fired Utility Units, it would not have been reasonable for the Agency to find that it was necessary to regulate such emissions under section 112 since, as discussed above, it should have realized that there was an available alternative mechanism, section 111, for regulating such emissions had it been appropriate to do so. See also Section VII below.

V. Statutory and Regulatory Overview of CAA Section 110(a)(2)(D) and Summary of EPA's Clean Air Interstate Rule, Which Implements Section 110(a)(2)(D)

A. The Clean Air Interstate Rule and Clean Air Act Section 110(a)(2)(D)

1. Background for Promulgation of the Clean Air Interstate Rule

The Administrator signed the notice of final rulemaking for the Clean Air Interstate Rule (CAIR) on March 10, 2005. The background for CAIR is fully described in the preambles to the final rule, the notice of proposed rulemaking, 69 FR 4565 (January 30, 2004) and the notice of supplemental rulemaking, 69 FR 12398 (March 16, 2004), and is briefly summarized below.

a. PM 2.5 NAAQS, 8-hour Ozone NAAQS, and the Nonattainment Problems. By notice dated July 18, 1997, we revised the NAAQS for particulate matter to add new standards for fine particles, using as the indicator particles with aerodynamic diameters smaller than a nominal 2.5 micrometers, termed PM 2.5. 62 FR 38652. We established health- and welfare-based (primary and secondary) annual and 24-hour standards for PM 2.5. The annual standard is 15 micrograms per cubic meter, based on the 3-year average of annual mean PM 2.5 concentrations. The 24-hour standard is a level of 65 micrograms per cubic meter, based on the 3-year average of the annual 98th percentile of 24-hour concentrations.

By a separate notice dated July 18, 1997, EPA also promulgated a revised primary NAAQS for ozone (and an identical secondary ozone NAAQS). This revised NAAQS, termed the 8-hour NAAQS, specified that the 3-year average of the fourth highest daily maximum 8-hour average ozone concentration could not exceed 0.08 ppm. (*See* 40 CFR 50.10) In general, the revised 8-hour standard is more protective of public health and the environment and more stringent than the pre-existing 1-hour ozone standard. Following promulgation of the 8-hour ozone and the PM 2.5 NAAQS, EPA anticipated that many areas of the country, particularly in the eastern half of the country, would have air quality violating one or both of those NAAQS.[34]

[34] Environmental Protection Agency, 1996. Review of the National Ambient Air Quality Standards for Particulate Matter: Policy Assessment

b. SO_2 and NO_X as Precursors for PM 2.5 and 8-hour Ozone. Fine particles are emitted directly from emissions sources and also can be formed in the atmosphere through the reaction of gaseous precursors. Sulfur dioxide and nitrogen oxides are among the primary precursors to the ''secondary'' formation of PM 2.5.

Eight-hour ozone is exclusively a secondary pollutant. Ozone is formed by natural processes at high altitudes, in the stratosphere, where it serves as an effective shield against penetration of harmful solar UV–B radiation to the ground. The ozone present at ground level as a principal component of photochemical smog is formed in sunlit conditions through atmospheric reactions of two main classes of precursor compounds: VOCs and NO_X (mainly NO and NO_2). Nitrogen oxides are emitted by motor vehicles, power plants, and other combustion sources, with lesser amounts from natural processes including lightning and soils.

Both PM 2.5 and 8-hour ozone are regional phenomena; that is each is caused by emissions over a broad geographic area. As a result, attainment of the PM 2.5 NAAQS requires reductions in SO_2 and NO_X over a widespread area, and attainment of the 8-hour ozone NAAQS requires reductions in NO_X over a widespread area. In the CAIR proposal, EPA described the photochemistry and need for regionwide reductions of precursors of both pollutants in detail. *See* 69 FR at 4572.

After promulgation of the PM 2.5 NAAQS, EPA was generally aware of the role of SO_2 and NO_X emissions in the PM 2.5 nonattainment problem, and, therefore, of the need for widespread reductions. Similarly, after promulgation of the 8-hour ozone NAAQS, EPA was aware of widespread nonattainment, due to nonattainment of the pre-existing, one-hour ozone standard, and therefore of the need for widespread NO_X reductions.

c. Coal-fired Utility Units Emit A Large Portion of SO_2 and NO_X Emissions. Utility Units emit a large portion of both the SO_2 and NO_X inventory. Congress clearly recognized that the utility industry emits a large portion of the nation's inventory of SO_2 and NO_X emissions when Congress enacted the acid deposition provisions in the 1990 Clean Air Act Amendments. EPA noted in the CAIR proposal that Utility Units—

> are the most significant source of SO_2 emissions and a very substantial source of NO_X in the * * * region [proposed to be affected by CAIR]. For example, EGUs [Utility Units] emissions are projected to represent approximately one-quarter (23 percent) of the total NO_X emissions in 2010 and over two-thirds (67 percent) of the total emissions in 2010 in the 28-State plus DC region that [EPA proposed for] being controlled for both SO_2 and NO_X after application of current CAA controls.

(*See* 69 FR 4565, 4609–10 January 30, 2004.)

Beginning in the mid-1990s, EPA has considered regional and national strategies to reduce interstate transport of SO_2 and NO_X. EPA described these efforts in the CAIR notice of final rulemaking.

3. Legal Authority

As noted above, in 1997, EPA revised the NAAQS for PM to add new annual average and 24-hour standards for fine particles, using PM 2.5 as the indicator (62 FR 38652). At the same time, EPA issued its final action to revise the NAAQS for ozone to establish new 8-hour standards (62 FR 38856.) Following promulgation of new NAAQS, the CAA requires all areas, regardless of their designation as attainment, nonattainment, or unclassifiable, to submit SIPs containing provisions specified under section 110(a)(2). SIPs for nonattainment areas are generally required to include additional emissions controls providing for attainment of the NAAQS. In addition, under the authority of section 110(a)(2)(D) and other provisions of section 110, EPA promulgated the NO_X SIP-Call in 1998. In that rulemaking, EPA determined that 22 States and the District of Columbia in the eastern half of the country significantly contribute to 1-hour and 8-hour ozone nonattainment problems in downwind States.[35] This rule required those jurisdictions to revise their SIPs to include NO_X control measures to mitigate the significant ozone transport. The EPA determined the emissions reductions requirements by projecting NO_X emissions to 2007 for all source categories and then reducing those emissions through controls that EPA determined to be highly cost-effective. The affected States were required to submit SIPs providing the resulting amounts of emissions reductions.

Under the NO_X SIP-Call, States had the flexibility to determine the mix of controls to meet their emissions reductions requirements. However, the rule provided that if the SIP controls Utility Units, then the SIP must establish a budget, or cap, for Utility Units. The EPA recommended that each State authorize a trading program for NO_X emissions from Utility Units. We developed a model cap and trade program that States could voluntarily choose to adopt, and all did so.

4. CAIR

In CAIR, EPA established SIP requirements for the affected upwind States under the authority of CAA section 110(a)(2)(D) and other provisions of section 110.[36] Based on air quality modeling analyses and cost analyses, EPA concluded that SO_2 and NO_X emissions in certain States in the eastern part of the country, through the phenomenon of air pollution transport, contribute significantly to downwind nonattainment of the PM 2.5 and 8-hour ozone NAAQS. In CAIR, EPA required SIP revisions in 28 States and the District of Columbia to reduce SO_2 and/or NO_X emissions, which are important precursors of PM 2.5 (NO_X and SO_2) and ozone (NO_X). The affected States and the District of Columbia are required to adopt and submit the required SIP revision with the necessary control measures by 18 months from date of signature of CAIR.

The 23 States along with the District of Columbia that must reduce annual NO_X emissions for the purposes of the PM 2.5 NAAQS are: Alabama, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, West Virginia, and Wisconsin.

The 25 States along with the District of Columbia that must reduce NO_X emissions for the purposes of the 8-hour ozone NAAQS are: Alabama, Arkansas, Connecticut, Delaware, Florida, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina,

of Scientific and Technical Information. OAQPS Staff Paper. Research Triangle Park, NC: Office of Air Quality Planning and Standards; Report No. EPA–45/R–96–013.

[35] *See* ''Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone; Final Rule,'' 63 FR 57356 (October 27, 1998). The EPA also published two Technical Amendments revising the NO_X SIP Call emission reduction requirements. (64 FR 26298; May 14, 1999 and 65 FR 11222; March 2, 2000).

[36] *See* ''Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Interstate Air Quality Rule); Proposed Rule,'' 69 FR 4566 (January 30, 2004); ''Supplemental Proposal for the Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule); Proposed Rule,'' 69 FR 32684 (June 10, 2004); and the final rule ''Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule),'' which was recently issued.

Tennessee, Virginia, West Virginia, and Wisconsin.

The emissions reductions requirements are based on controls that EPA determined to be highly cost-effective for Utility Units. However, States have the flexibility to choose the measures to adopt to achieve the specified emissions reductions. If the State chooses to control Utility Units, then it must establish a budget—that is, an emissions cap—for those sources. CAIR defines the Utility Units budgets for each affected State. Due to feasibility constraints, EPA is requiring that emissions reductions be implemented in two phases, with the first phase in 2009 (for NO_X) and 2010 (for SO_2), and the second phase in 2015.

As noted above, under the CAIR, each State may independently determine which emissions sources to subject to controls, and which control measures to adopt. The EPA's analysis indicates that emissions reductions from Utility Units are highly cost-effective, and in the CAIR, EPA encouraged States to adopt controls for Utility Units. States that do so must place an enforceable limit, or cap, on Utility Unit's emissions. The EPA calculated the amount of each State's Utility Unit emissions cap, or budget, based on reductions that EPA determined are highly cost-effective. States may allow their Utility Units to participate in an EPA-administered cap-and-trade program as a way to reduce the cost of compliance, and to provide compliance flexibility. The EPA will administer these programs, which will be governed by rules provided by EPA that States may adopt or incorporate by reference.

EPA estimated that the CAIR would reduce annual SO_2 emissions by 3.6 million tons by 2010 and by 4.0 million tons by 2015; and would reduce annual NO_X emissions by 1.3 million tons by 2010 and by 1.5 million tons by 2015. If all the affected States choose to achieve these reductions through Utility Unit controls, then Utility Unit emissions in the affected States would be capped at 3.7 million tons in 2010 and 2.6 million tons in 2015; and Utility Unit annual NO_X emissions would be capped at 1.5 million tons in 2010 and 1.3 million tons in 2015. The EPA estimated that the required SO_2 and NO_X emissions reductions would, by themselves, bring into attainment 52 of the 80 counties that are otherwise expected to be in nonattainment for PM 2.5 in 2010, and 57 of the 75 counties that are otherwise expected to be in nonattainment for PM 2.5 in 2015. The EPA further estimated that the required NO_X emissions reductions would, by themselves, bring into attainment 3 of the 40 counties that are otherwise expected to be in nonattainment for 8-hour ozone in 2010, and 6 of the 22 counties that are expected to be in nonattainment for 8-hour ozone in 2015. In addition, the CAIR would improve PM 2.5 and 8-hour ozone air quality in the areas that would remain nonattainment for those two NAAQS after implementation of CAIR. Because of the CAIR, the States with those remaining nonattainment areas will find it less burdensome and less expensive to reach attainment by adopting additional local controls. The CAIR would also reduce PM 2.5 and 8-hour ozone levels in attainment areas.

C. Utility Mercury Emission Reductions Expected as Co-Benefits From CAIR

The final CAIR requires annual SO_2 and NO_X reductions in 23 States and the District of Columbia, and also requires ozone season NO_X reductions in 25 States and the District of Columbia. Many of the CAIR States are affected by both the annual SO_2 and NO_X reduction requirements and the ozone season NO_X requirements. CAIR was designed to achieve significant emissions reductions in a highly cost-effective manner to reduce the transport of fine particles that have been found to contribute to nonattainment. EPA analysis has found that the most efficient method to achieve the emissions reduction targets is through a cap-and-trade system on the power sector that States have the option of adopting. In fact, States may choose not to participate in the optional cap-and-trade program and may choose to obtain equivalent emissions reductions from other sectors. However, EPA believes that a region-wide cap-and-trade system for the power sector is the best approach for reducing emissions. The power sector accounted for 67 percent of nationwide SO_2 emissions and 22 percent of nationwide NO_X emissions in 2002.

EPA expects that States will choose to implement the final CAIR program in much the same way they chose to implement their requirements under the NO_X SIP Call. As noted above, under the NO_X SIP Call, EPA gave States ozone season NO_X reduction requirements and the option of participating in a cap-and-trade program. In the final rulemaking, EPA analysis indicated that the most efficient method to achieve reductions targets would be through a cap-and-trade program. Each affected State, in its approved SIP, chose to control emissions from Utility Units and to participate in the cap-and-trade program.

Therefore, EPA anticipates that States will comply with CAIR by controlling Utility Unit SO_2 and NO_X emissions. Further, EPA anticipates that States will implement those reductions through the cap-and-trade approach, since the power sector represents the majority of national SO_2 emissions and the majority of stationary NO_X emissions, and represent highly cost-effective SO_2 and NO_X sources to reduce. For further discussion of cost-effectiveness, see section IV of CAIR notice of final rulemaking. EPA modeled a region-wide cap and trade system on the power sector for the States covered by CAIR, and this modeling projected that most reductions in NO_X and SO_2 would come through the installation of scrubbers, for SO_2 control, and selective catalytic reduction for NO_X control (see Regulatory Impact Assessment for CAIR and CAMR in docket). Scrubbers and SCR are proven technologies for controlling SO_2 and NO_X emissions and sources installed them to comply with the Acid Rain trading program and the NO_X SIP Call trading program. EPA's modeling also projected that the installation of these controls would achieve Hg emission reductions as a co-benefit.

EPA projections of Hg co-benefits are based on 1999 Hg ICR emission test data and other more recent testing conducted by EPA, DOE, and industry participants. (For further discussion see Control of Emissions from Coal-Fired Electric Utility Boilers: An Update, EPA/Office of Research and Development, March 2005, in the docket). That emission testing has provided a better understanding of Hg emissions and their capture in pollution control devices. Mercury speciates into three basic forms, ionic, elemental, and particulate (particulate represents a small portion of total emissions). In general, ionic Hg compounds are more readily absorbed than elemental Hg and the presence of chlorine compounds (which tend to be higher for bituminous coals) results in increased ionic Hg. Overall the 1999 Hg ICR data revealed higher levels of Hg capture for bituminous coal-fired plants as compared to subbituminous and lignite coal-fired plants and a significant capture of ionic Hg in wet SO_2 scrubbers. Additional Hg testing indicates that for bituminous coals SCR has the ability to convert elemental Hg to ionic Hg and thus allow easier capture in a wet scrubber. This understanding of Hg capture was incorporated into EPA modeling assumptions and is the basis for our projections of Hg co-benefits from installation of scrubbers and SCR under CAIR.

The final CAIR requires annual SO_2 and NO_X reductions in two phases, the

first phase in 2010 and the second phase in 2015. EPA modeling of CAIR projected that most reductions in NO_X and SO_2 would come through the installation of scrubbers and SCR, and that the installation of these controls would also achieve Hg emission reductions as a co-benefit. Given the history of the Acid Rain and NO_X SIP Call trading programs, and our experience with those programs, we anticipate that reductions in SO_2 emissions will begin to occur before 2010 because of the ability to bank SO_2 emission allowances, though to some degree this is limited by the time and resources needed to install control technologies. Companies have an incentive to achieve greater SO_2 reductions than needed to meet the current Acid Rain cap because the excess allowances they generate can be ''banked'' and either later sold on the market or used to demonstrate compliance in 2010 and beyond at the facility that generated the excess allowances. Based on the analysis of CAIR, EPA's modeling projects that Hg emissions would be 38.0 tons (12 tons of non-elemental Hg) in 2010, 34.4 tons in 2015 (10 tons of non-elemental Hg), and 34.0 tons in 2020 (9 tons of non-elemental Hg), about a 20 and 30 percent reduction (in 2010 and 2015, respectively) from a 1999 baseline of 48 tons.[37] For further discussion of EPA modeling results and projected emissions see Chapter 8 of the Regulatory Impact Assessment.[38]

[37] As discussed in the TSD, the emissions of reactive gaseous Hg and particle-bound Hg are most important for local and regional Hg deposition purposes, since they are substantially more likely to be deposited than elemental Hg. CAIR and CAMR will significantly reduce reactive gaseous Hg and particle bound Hg from 2001 levels. CAIR will reduce the levels from approximately 22 tons to 9 tons. CAMR will reduce this level further to between 7 and 9 tons, for a total reduction (with CAIR) of roughly 70 percent.

[38] In addition to CAIR, EPA recently promulgated another rule for Utility Units. Specifically, on March 15, 2005, the Administrator signed a final rulemaking called the Clean Air Mercury Rule (''CAMR'') pursuant to CAA section 111. This rule sets standards of performance for Hg emitted from both new and existing coal-fired Utility Units. Like CAIR, the rule establishes a cap-and-trade mechanism by which Hg emissions from new and existing coal-fired Utility Units are capped at specified, nation-wide levels. The first phase cap of 38 tons per year (''tpy'') becomes effective in 2010 and the second phase cap of 15 tpy becomes effective in 2018. Facilities must demonstrate compliance with the standards of performance by holding one ''allowance'' for each ounce (oz) of Hg emitted in any given year. Allowances are readily transferrable among all regulated units. As explained in section VI below, the level of Hg emissions remaining after implementation of CAMR do not result in hazards to public health.

VI. Scientific and Technical Background and EPA'S Conclusions Concerning the Level of Utility Attributable Mercury Emissions After CAIR and CAMR

In this section, we explain why we believe the level of utility attributable Hg emissions remaining after imposition of CAIR, and independently, CAMR, will not result in hazards to public health. The issue of whether utility Hg emissions remaining after CAIR, and independently CAMR, result in hazards to public health is directly related to our conclusion, stated above in Section IV.A, that we cannot find it appropriate and necessary to regulate coal-fired Utility Units under section 112 on the basis of Hg emissions. This section includes an overview of the scientific and technical information relevant to evaluating utility Hg emissions and the public health impacts associated with such emissions. Below, we provide general background concerning the health impacts of methylmercury; the predominant exposure pathway by which humans are affected by methylmercury, which is by ingestion of fish containing methylmercury; and EPA's methodology for determining the impacts of utility Hg emissions on the amount of methylmercury found in fish tissue. This section also includes a summary of our conclusions, including that utility Hg emissions remaining after implementation of CAIR, and independently CAMR, are not reasonably anticipated to result in hazards to public health.

A. Human Health Impacts of Methylmercury Exposure and Amounts of Hg Emissions

Hg is a persistent, bioaccumulative toxic metal that is emitted from power plants in three forms: Elemental mercury (Hg\0\), oxidized mercury (Hg\++\) compounds, as well as particle-bound mercury. Methylmercury is formed by microbial action in the top layers of sediment and soils, after Hg has precipitated from the air and deposited into water bodies or land. Once formed, methylmercury is taken up by aquatic organisms and bioaccumulates up the aquatic food web. Larger predatory fish may have methylmercury concentrations many times that of the water body in which they live.

While Hg is toxic to humans when it is inhaled or ingested, we focus on oral exposure of methylmercury in this rulemaking, as it is the route of primary interest for human exposures in the U.S. Methylmercury is a well-established human neurotoxicant. Methylmercury that is ingested by humans is readily absorbed from the gastrointestinal tract and can cause effects in several organ systems. The best studied effect of low level exposure is the ability of methylmercury to cause subtle, yet potentially important neurodevelopmental effects. Of particular concern is the effect of methylmercury on the developing fetal nervous system exposed in utero from maternal fish ingestion. Large prospective epidemiological studies have reported that prenatal methylmercury from environmental exposures has been associated with poor performance on neurobehavioral tests in children. These include tests that measure attention, visual-spatial ability, verbal memory, language skills, and fine motor function. These studies have been thoroughly reviewed, singly and as part of review groups, by many expert scientists, including a panel of the National Research Council (NRC) of the National Academy of Sciences (NAS).[39] While important, the weight of evidence for cardiovascular effects is not as strong as it is for childhood neurological effects and the state of the science is still being evaluated. However, some recent epidemiological studies in men suggest that methylmercury is associated with a higher risk of acute myocardial infaraction, coronary heart disease and cardiovascular disease in some populations. Other recent studies have not observed this association. The findings to date and the plausible biological mechanisms warrant additional research in this area (Stern 2005; Chan and Egeland 2004). There is some recent evidence that methylmercury may result in genotoxic or immunotoxic effects. Overall, there is a relatively small body of evidence from human studies that suggests exposure to methylmercury can result in immunotoxic effects and the NRC concluded that evidence that human exposure caused genetic damage is inconclusive. There are insufficient human data to evaluate whether these effects are consistent with levels in the U.S. population. Because the developing fetus may be the most sensitive to the effects from methylmercury, women of

[39] Studies investigating the relationship between methylmercury and cardiovascular effects have reached different conclusions. Some recent epidemiological studies of men suggest that methylmercury is associated with a higher risk of acute myocardial infarction, coronary heart disease and cardiovascular disease in some populations. Other research with less corroboration suggest that reproductive, renal, and hematological impacts may be of concern. There are insufficient human data to evalaute whether these effects are consistent with levels in the U.S. population. *See* RIA for CAMR chapter 2.

child-bearing age are regarded as the population of greatest interest when assessing methylmercury exposure.

The predominant pathway of Hg exposure to both humans and wildlife is consumption of fish. Critical elements in estimating methylmercury exposure and risk from fish consumption include the concentrations of methylmercury in the fish consumed, the quantity of fish consumed,[40] and how frequently the fish is consumed. There is a great deal of variability among individuals in fish consumption rates. However, our analysis indicates that the typical U.S. consumer eating moderate amounts of a wide variety of low-mercury fish from restaurants and grocery stores is not expected to ingest harmful levels of methylmercury from fish. Those who regularly and frequently consume large amounts of fish, or fish with higher levels of methylmercury, are more exposed. The EPA and Food and Drug Administration jointly, as well as states, have issued fish consumption advisories to inform people of ways to reduce exposure to methylmercury from fish.

As part of its long term U.S. population surveillance, the U.S. Centers for Disease Control (CDC) assessed Hg concentrations in blood of over 3,600 women of child-bearing age under the National Health and Nutrition Examination Survey (NHANES). A recent analysis of these data reported that about 6 percent of these women of child-bearing age have levels of Hg in their blood that are at or above the U.S. EPA's RfD, described below. The CDC also surveyed the same group of women about their eating habits. An analysis of 1500 of these women showed that Hg blood levels were higher in the women who reported eating three or more servings of fish in the month before they were tested. It is reasonable to conclude that methylmercury contained in seafood may be responsible for elevated levels of Hg in U.S. women of child-bearing age.[41]

As described below, the analysis supporting today's action focuses on assessing exposure from freshwater fish caught and consumed by recreational and subsistence anglers because available information indicate that U.S. utility Hg emissions may affect the methylmercury concentrations in these fish. EPA also considered the following fish consumption pathways: Consumption from commercial sources (including saltwater and freshwater fish from domestic and foreign producers); consumption of recreationally caught marine fish, consumption of recreationally caught estuarine fish; and consumption of commercial fish raised at fish farms (aquaculture). For a number of reasons, as explained in the TSD, current information does not suggest that these latter pathways present meaningful risks of ingestion of utility-attributable methylmercury.

The EPA's 1997 Mercury Study Report to Congress suggests a plausible link between anthropogenic releases of Hg from industrial and combustion sources in the U.S. and methylmercury in fish in the U.S. However, other sources of Hg emissions, including Hg from natural sources (such as volcanos) and anthropogenic emissions in other countries, contribute to the levels of methylmercury observed in fish in the U.S.[42] Our current understanding of the global Hg cycle and the impact of the anthropogenic sources allow us to make estimates on a global, continental, or regional scale of their relative importance. It is more difficult to make accurate predictions of the fluxes on a local scale given our current understanding.

We recognize that it is also difficult to quantify with precision how a specific change in air deposition of Hg leads to a change in fish tissue levels. We further recognize that the relationship between the amount of Hg emissions reduced and the attendant reduction in methlymercury fish concentrations depends upon the specific characteristics of the waterbody at issue. Nevertheless, science continues to evolve and EPA has made substantial progress in developing methods for assessing the amount of methylmercury in fish tissues that may be traced to emissions from coal-fired U.S. Utility Units. We describe our methodology below and why this methodology is sufficient to support today's action.

As discussed above, we are focusing on consumption of self-caught, freshwater fish. We estimate that there are approximately 27.9 million recreational freshwater fishers in the U.S. population, including fishers who do not eat (*e.g.,* release) their catch. Based on application of a ''consuming'' factor and a ''sharing'' factor to the estimate of recreational fishers, as discussed further in the RIA to CAMR, we estimate that approximately 58.6 million individuals in the U.S. population consume recreationally-caught freshwater fish. Of these individuals, we estimate that approximately 7.5 to 10.5 million are women of child-bearing age (that is, 15–44 years old), about 500,000 of whom are expected to give birth in any one year. We estimate that the mean recreational freshwater fish consumption rate for these women is 8 grams/day, and the 95th percentile recreational freshwater fish consumption rate is 25 grams/day. A subset of recreational freshwater fish consumers may consume at higher levels, as discussed below. In addition, subsistence fishers and fishers in certain ethnic groups are expected to have generally higher fish consumption rates than consumers of recreational freshwater fish. These sub-populations are discussed below.

B. The Methylmercury Reference Dose

EPA generally quantifies risk of adverse health effects other than cancer by calculating a reference value (RfV). In general, an RfV is an estimation of an exposure that is likely to be without an appreciable risk of adverse effects over a lifetime. See *http://www.epa.gov/iris/gloss8.htm.* RfVs for exposure by ingestion are called reference doses (RfD).

The EPA defines an RfD as ''an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL (no observed adverse effect level), LOAEL (lowest observed adverse effect level), or benchmark dose, with uncertainty factors generally applied to reflect limitations of the data used.'' *See http://www.epa.gov/iris/gloss8.htm.*

As stated above, an RfD is derived by choosing a point of departure from animal or human data. This can be a NOAEL or LOAEL, either of which may be defined by applying statistical tests and scientific judgment to the data. When the data are sufficient, one can apply a mathematical model to obtain a benchmark dose (BMD). The BMD is the dose at which a particular level of response (*i.e.*, the benchmark response,

[40] A precise estimate of methylmercury exposure depends on quantity of fish consumed as a function of an individual's body weight.

[41] 289 JAMA 1667 (April 2, 2003).

[42] Recent Hg estimates (which are highly uncertain) of annual total global emissions from all sources (natural and anthropogenic) are about 5,000 to 5,500 tons per year (tpy). Of this total, about 1,000 tpy are estimated to be natural emissions and about 2,000 tpy are estimated to be contributions through the natural global cycle of re-emissions of Hg associated with past natural releases and anthropogenic activity. Current anthropogenic emissions account for the remaining 2,000 tpy. Given the global estimates noted above, U.S. anthropogenic Hg emissions are estimated to account for roughly 3 percent of the global total, and U.S. utilities are estimated to account for about 1 percent of total global emissions. Deposition from U.S. utilities is described in greater detail below. Utility RTC at 7–1 to 7–2; Mercury NPR, 69 FR 4657–58 (January 20, 2004); RIA for CAMR chapters 5–6.

or BMR) for some outcome of concern is found to occur. One can then derive a BMD lower confidence limit (BMDL), which is a statistical lower bound on the chosen BMD, an exposure expected to produce a specified effect in some defined percentage of a test population.

The point of departure (again, NOAEL, LOAEL, or BMDL) is divided by uncertainty/variability factors to arrive at the RfD. The uncertainty factors are intended to account for variability and uncertainty in the data. The size of an uncertainty/variability factor is determined by the adequacy or limitations of the data and is typically either 10 or 3 for each type of variabilty. For example, uncertainty factors may be employed for extrapolating from animals to humans, variability in human susceptibility (sensitive populations), and extrapolating from subchronic to chronic exposures. The resulting RfD is believed to be the amount of a chemical which, when ingested daily over a lifetime, is likely to be without an appreciable risk of deleterious effects to humans, including sensitive subpopulations.

In 2001, EPA published an RfD for methylmercury that is based on a BMD approach. This quantitative risk estimate was based on data from developmental neurotoxicity studies mentioned above; specifically, deficits in tests associated with ability to learn and process information. EPA applied an uncertainty/variability factor of 10 to the point of departure (BMDL) to derive the RfD. EPA's RfD for methylmercury is 0.1 μg/kg bw/day, which is 0.1 micrograms of Hg per day for each kilogram of a person's body weight.

As noted in the Hg Proposal, at the direction of Congress, EPA funded the NAS to perform an independent evaluation of the available data related to the health impacts of methylmercury and provide recommendations for EPA's RfD. The NAS/National Research Council (NRC) conducted an 18-month study of the available data on the health effects of methylmercury. The review by the NAS, published in July 2000, concluded that the neuro-developmental effects are the most sensitive and well-documented effects of methylmercury exposure. The NRC advised revising the basis of the RfD, which used data from a short-term exposure in Iraq, to incorporate new studies on children exposed in utero when their mothers ate seafood containing Hg. EPA subsequently established a reference dose of 0.0001 mg/kg bw/day. NAS determined that EPA's RfD ''is a scientifically justified level for the protection of public health.''

The methylmercury RfD is further described in the RIA, chapter 2 and in other EPA documents (IRIS, U.S. EPA 2001; Water Quality Criteria for the Protection of Human Health: Methylmercury, EPA–823–R–01–001). Briefly, EPA used as the point of departure BMDLs for multiple endpoints from the three studies of in utero methylmercury exposure and effects. These were conducted in the Faroes and Seychelles Islands and in New Zealand.[43] All of the endpoints were children's scores on neuropsychological tests. Consistent with NRC recommendations, an uncertainty/variability factor of 10 was used to account for pharmacokinetic and pharmacodynamic variability in the human population. In the EPA documents, one data set from the Faroes (Boston Naming Test, full cohort) is displayed for all calculations as an example of the multiple BMDLs which serve as the basis for the RfD.

In determining the RfD for methylmercury, EPA said that the ''RfD can be considered a threshold for a population at which it is unlikely that adverse effects will be observed'' (Water Quality Criteria for the Protection of Human Health: Methylmercury, EPA–823–R–01–001). The RfD was calculated to be a level ''likely to be without an appreciable risk,'' of ''deleterious effects'' for all populations, including sensitive subgroups. EPA does not further quantify the degree of risk which would be expected for exposures at or above the methylmercury RfD. This is the case for all of EPA's RfDs. Additional regulatory values support a similar threshold approach for describing risks to methylmercury exposure. For example, the World Health Organization sets the level at 0.23 μg/kg/day; Health Canada sets the level at 0.2 μg/kg/day; and the Agency for Toxic Substances and Disease Registry (ATSDR) sets a value of 0.3 μg/kg/day.

EPA has established the RfD at a level such that exposures at or below the RfD are unlikely to be associated with appreciable risk of deleterious effects. It is important to note, however, that the RfD does not define an exposure level corresponding to zero risk; exposure near or below the RfD could pose a very low level of risk which EPA deems to be non-appreciable. It is also important to note that the RfD does not define a bright line, above which individuals are at risk of adverse effects.

Further, in EPA's 1989 Residual Risk Report to Congress, we stated:

> It should be noted that exposures above an RfD or RfC do not necessarily imply unacceptable risk or that adverse health effects are expected. Because of the inherent conservatism of the RfC/RfD methodology, the significance of exceedances must be evaluated on a case-by-case basis, considering such factors as the confidence level of the assessment, the size of UF used, the slope of the dose-response curve, the magnitude of the exceedance, and the number or types of people exposed at various levels above the RfD or RfC.[44]

[43] More specifically, the subjects of the Seychelles longitudinal prospective study were 779 mother-infant pairs from a fish-eating population (Myers *et al.*, 1995a–c, 1997; Davidson *et al.*, 1995, 1998). Infants were followed from birth to 5.5 years of age, and assessed at various ages on a number of standardized neuropsychological endpoints. The independent variable was maternal-hair Hg levels. The Faroe Islands study was a longitudinal study of about 900 mother-infant pairs (Grandjean *et al.*, 1997). The main independent variable was cord-blood Hg; maternal-hair Hg was also measured. At 7 years of age, children were tested on a variety of tasks designed to assess function in specific behavioral domains. The New Zealand study was a prospective study in which 38 children of mothers with hair Hg levels during pregnancy greater than 6 ppm were matched with children whose mothers had lower hair Hg levels (Kjellstrom *et al.*, 1989, 1986). At 6 years of age, a total of 237 children were assessed on a number of neuropsychological endpoints similar to those used in the Seychelles study (Kjellstrom *et al.*, 1989). The Seychelles study yielded no statistically significant evidence of impairment related to in utero methylmercury exposure, whereas the other two studies found dose-related effects on a number of neuropsychological endpoints. In the assessment described here, an integrative analysis of all three studies was relied upon in setting the point of departure for derivation of the RfD. As noted by NRC in reference to data from the Seychelles, Faroe Islands, and New Zealand, ''because those data are epidemiological, and exposure is measured on a continuous scale, there is no generally accepted procedure for determining a dose at which no adverse effects occur.'' (NRC 2000)

[44] U.S. Environmental Protection Agency. 1989. Risk Assessment Guidance for Superfund: Volume I. Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response. Washington, DC, EPA/541/1–89/002, at 52–53 *http://www.epa.gov/oswer/riskassessment/ragsa/pdf/ch8.pdf* (Residual Risk Report). The Residual Risk Report further stated:

> It is expected that an HI (*i.e.*, hazard index (HI)), which is the sum of more than one hazard quotient for multiple substances and/or multiple exposure pathways) less than 1 that is derived using target organ specific hazard quotients would ordinarily be considered acceptable. If the HI is greater than 1, then the amount by which the HI is greater than 1, the uncertainty in the HI, the slope of the dose-response curve, and a consideration of the number of people exposed would be considered in determining whether the risk is acceptable. Evaluation of the acceptable value for an HQ (*i.e.*, hazard quotient (HQ), which is the ratio of the exposure level to a reference exposure level (*e.g.*, RfD)) or an HI of 1 also would consider the values of UFs (*i.e.*, uncertainty/variability factor (UF)), which is a default factor—generally 10-fold—used in operationally deriving the RfD or RfC from experimental data) and the confidence in the RfC that are used in the calculation of the HI. In general, it is considered that each UF is somewhat conservative; because all factors are not likely to simultaneously be at their most extreme (highest) value, a combination of several factors can lead to substantial conservatism in the final value. Larger

Continued

C. Methylmercury Levels in Fish and the Methylmercury Water Quality Criterion

As noted above, the most important pathway of exposure to Hg for humans is through the consumption of fish and seafood. These include saltwater fish such as tile fish, shark, and swordfish, which are most often caught commercially. They also include freshwater fish such as bass, perch, and walleye, which are often caught recreationally, commercially, or for personal consumption or distribution. Generally shellfish have lower levels of methylmercury than do finfish. The levels of Hg in fish and shellfish are variable, with mean levels ranging from non-detectable to 1.45 mg/kg, depending on species. See FDA Mercury Levels in Commercial Fish and Shellfish (*http://www.cfsan.fda.gov/~frf/sea-mehg.html*).

Methylmercury exposure is a function of how much fish is eaten (on a bodyweight basis), how frequently fish is eaten, and the methylmercury concentration in the fish. As a result, estimates of the amount and type of fish consumption are important to assessing the impacts of methylmercury attributed to coal-fired Utility Units on public health.

Hg is emitted from powerplants in three forms: Elemental Hg, reactive (oxidized) Hg, and particulate Hg. Most of the local and regional Hg deposition is associated with the emissions of reactive Hg. For this reason, the magnitude of reactive Hg emission from powerplants is critical to Hg deposition in the United States. As noted above, FGD and SCR control technologies are most effective in controlling reactive Hg emissions. As indicated by Table VI–2, roughly 90 percent of the Hg reductions under CAIR in 2020 are reactive Hg. As a result, the SO_2 and NO_X limits established by CAIR yield significant reductions (roughly 70 percent) in reactive Hg emissions from powerplants.

Americans eat fish from a variety of sources. An individual's fish diet can be composed of commercial fish and shellfish (both imported and domestic), fish from aquaculture (or farm raised fish for commercial sale), and fish from non-commercial sources (*e.g.*, recreationally caught fish, fish caught to meet dietary needs, and/or fish caught for cultural or traditional reasons). These fish may come from marine, estuarine, or freshwater sources.

Using the 2001 RfD and information on Hg exposure routes, EPA published a recommended ambient water quality criterion for the states' and tribes' use in setting water quality standards for U.S. waters (freshwater and estuarine) that are designed to protect human health. EPA issued the methylmercury water quality criterion in 2001. Water Quality Criterion for the Protection of Human Health: Methylmercury. EPA–823–R–01–001. Office of Science and Technology, Office of Water, USEPA, Washington, DC, USEPA 2001) Because of the wide variability in methylmercury bioaccumulation among waterbodies, EPA set the criterion as a fish tissue level rather than as an ambient water concentration. The criterion is 0.3 mg/kg (milligram methylmercury per kilogram of wet-weight fish tissue). The criterion is a risk assessment number that states and authorized tribes may use in their programs for protection of designated uses.

The Clean Water Act (CWA) and EPA's regulations specify requirements for adoption of water quality criteria. States and authorized tribes must adopt water quality criteria that protect designated uses. See CWA section 303(c)(2)(A). Water quality criteria must be based on a sound scientific rationale and must contain sufficient parameters or components to protect the designated uses. See 40 CFR 131.11. States and authorized tribes must adopt criteria for all toxic pollutants where EPA has established ambient water quality criteria where the discharge or presence of these pollutants could reasonably interfere with the designated uses. See CWA Section 303(c)(2)(B). EPA issued guidance on how states and authorized tribes may comply with section 303(c)(2)(B) which is now contained in the *Water Quality Standards Handbook: Second Edition* (EPA, 1994). States and authorized tribes that decide to use the recommended methylmercury criterion as the basis for new or revised methylmercury water quality standards have the option of adopting the criterion as a fish tissue concentration into their water quality standards, adjusting the criterion to account for state or local exposure, or adopting it as a traditional water column concentration. States and authorized tribes remain free not to use EPA's current recommendations, provided that their new or revised water quality criteria for methylmercury protect the designated uses and are based on a scientifically defensible methodology.

The methylmercury water quality criterion incorporated the RfD, data on freshwater and estuarine finfish and shellfish consumption for the target population (the adult general population), and information on exposure to methylmercury as a result of consumption of marine fish (for methylmercury, exposure from any route other than eating fish is negligible). Specifically, EPA assumed a default intake of freshwater and estuarine and marine finfish and shellfish of 17.5 grams per day (or two 8-ounce meals a month) conforming to EPA's methodology. (EPA; ''Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000),'' EPA–822–B–00–004 (October 2000) (''2000 Water Quality Criteria Methodology'')). This default (to be used by EPA for national criteria or others in the absence of data specific to a waterbody) is the 90th percentile total (commercial and non-commercial) freshwater and estuarine finfish and shellfish consumption reported by adults, both consumers and non-consumers. The source of this data is the 1994–1996 Continuing Study of Food Intake by Individuals (CSFII). This is a large ongoing U.S. food consumption survey conducted by USDA.

In addition, in accordance with EPA's published methodology, in developing the criterion, EPA used a relative source contribution (RSC) approach to apportion the RfD to ensure that the water quality criterion is protective, given other sources of exposure. The RSC approach apportions the RfD according to routes of exposures; for methylmercury this adjustment was done to account for marine fish consumption, as the criterion is for freshwater and estuarine finfish and shellfish. In deriving the methylmercury water quality criterion, EPA assumed an exposure to methylmercury in marine fish that is equivalent to 27 percent of RfD. That is, EPA developed the criterion so that it would be protective even if an individual is consuming typical amounts of fish from other sources (*i.e.*, marine fish).

D. EPA's Methodology for Assessing Methylmercury Levels in Fish Tissues

To estimate methylmercury levels, including methylmercury attributable to Utility Units, in consumed freshwater fish, EPA's analysis relied primarily on monitoring data (*i.e.*, fish tissue samples collected from freshwater sites across the study area). EPA used sources of national-level monitored Hg data. The

composite UF lead to more conservative RfC. Conversely, lower composite UF are less conservative and usually indicate a higher level of confidence in the RfC. Intermediate UF values or a mixture of high and low UF would require an examination of the relative contribution of various chemicals to the HI. Thus, an HI or HQ greater than 1 may be considered acceptable based on consideration of other factors.

Id. at 125.

National Listing of Fish and Wildlife Advisories (NLFA), which is maintained by EPA, contains data from over 80,000 fish tissue samples across the U.S. In addition to the NLFA, EPA's National Fish Tissue Survey (NFTS) provides useful data. Conducted in 2000–2003, this dataset includes fish tissue samples from 500 randomly selected lakes and reservoirs across the U.S. EPA considers these combined two data sets to be sufficiently comprehensive and sufficiently inclusive of the waterbodies of highest exposure for use in EPA's regional analysis, although, as discussed in the TSD, for certain areas of the country, gaps in the datasets have led EPA to rely on overall regional trends to draw conclusions for local areas.

The NLFA is the most extensive available source of fish tissue sampling data for Hg. It currently includes fish tissue contaminant data collected by states (and submitted to EPA) from over 10,000 locations nationwide, with most of the locations in the eastern half of the U.S. In general, the States historically sampled waterbodies in areas of suspected contamination. More recently, states have also focused sampling efforts on areas of elevated fishing pressure. Almost all of the tissue samples include tests for Hg. The NLFA includes roughly 83,000 Hg samples collected in the U.S. between 1967 and 2002. In the dataset, most samples are described according to the sample location, sample date, measured Hg concentration, species and size of fish, and the part of the fish sampled.

Based on the geographic coordinates provided in the NLFA database, EPA also defined two additional fields for each Hg sample:

—The eight-digit watershed (hydrological unit code (HUC) (discussed below)) in which the sample was located; and

—The type of waterbody (*i.e.*, lake or river/stream) from which the sample was taken.

The HUC, developed by the USGS, spatially delineates watersheds throughout the United States. Hydrologic units are available at four levels of aggregation, ranging from a two-digit regional level (21 units nationwide) to the eight-digit HUC (2,150 distinct units). The eight-digit HUC-level designation is useful for this analysis because it provides a nationally consistent approach for grouping waterbodies on a ''local'' scale (the average HUC area is 1,631 sq mi).[45]

We made the water body type assignments using proximity analysis in ArcINFO. Each sampling site was assigned to either a flowing (*e.g.*, river, stream) or a stationary (*e.g.*, lake, reservoir) waterbody, according the type of waterbody most closely located to the site's lat/long coordinates. We used National Hydrology Dataset (NHD) in the proximity analysis.

For purposes of the modeling described below, we restricted the samples selected from the NLFA data to those that met the following criteria:

- Collected after 1999;
- Sampled from freshwater species (*i.e.*, saltwater species are excluded from the analysis); and
- Sampled from freshwater (rather than estuarine or coastal) waterbodies.

These NLFA Hg sampling data were supplemented with additional observations from EPA's National Fish Tissue Survey (NFTS). Compiled in 2000–2003, this dataset includes fish tissue samples from 500 randomly selected lakes and reservoirs across the U.S. Combining data from NLFA and NFTS, samples from 1633 lake and river sampling sites were selected for the analysis.

Although the NLFA and NFTS provide rich sources of data on Hg levels in freshwater fish for the study area, the fish tissue samples in these databases vary in several respects. For example, they vary according to the size and species of fish sampled and according to the sampling method used (*e.g.*, the cut of fish sampled). We limited the samples we used for this analysis to fish likely to be caught and consumed, defined for this analysis as fish greater than or equal to seven inches in length.

The TSD describes in more detail how we used the data available in the NLFA and NFTS datasets.

E. Air Quality Modeling of the Impacts of Utility Unit Hg on Fish Tissue Levels

EPA conducted computerized modeling that indicates the effects of various scenarios for Utility Unit Hg emissions on fish tissue at the NLFA–NFTS sites across the country, in both a 2001 base case and in projected control cases for the year 2020. This section summarizes the emissions inventories used in those modeling scenarios, and the air quality modeling, that serve as the basis for determining the fish tissue impacts of Hg from Utility Units at various levels of emissions.

EPA used a sophisticated air quality model to estimate baseline and post-control annual total Hg deposition for each scenario. EPA then combined the estimated changes in Hg depositions with fish tissue data to determine estimated changes in methylmercury levels in fish tissues. EPA then combined those changes in fish tissue methylmercury levels with estimates of fish consumption, for use in estimating exposure levels.

1. Air Quality Modeling for Hg Deposition From Utility Mercury Emissions

This section summarizes the methods for estimating Hg deposition for 2001 and 2020 base cases and control scenarios. EPA estimated the Hg deposition changes using national-scale applications of the Community Multi-Scale Air Quality (CMAQ) model in the contiguous United States.

a. CMAQ Model and Hg Deposition Estimates. CMAQ is a three-dimensional grid-based Eulerian air quality model designed to estimate annual particulate concentrations and Hg deposition over large spatial scales (*e.g.*, over the contiguous United States). Because it accounts for spatial and temporal variations as well as differences in the reactivity of emissions, CMAQ is useful for evaluating the impacts of changes in utility Hg emissions, under various scenarios, on U.S. Hg deposition. Our analysis applies the modeling system to the entire United States for the following emissions scenarios:

(1) A 2001 base year;

(2) A 2001 base year of utility Hg emissions only;

(3) A 2020 projection that includes utility Hg emissions as reduced through implementation of CAIR;

(4) A 2020 projection with utility Hg emissions zeroed-out;[46]

(5) A 2020 projection that includes utility Hg emissions as reduced through implementation of CAMR (which, in turn, reflects both CAIR reductions and the reductions from the additional, 2018 controls); and

(6) A 2020 projection that includes utility Hg emissions as reduced through a second CAMR option (this second CAMR option reflects both CAIR reductions and a set of additional reductions that are tighter than the ones adopted in CAMR).

The CMAQ version 4.3 was employed for this CAMR modeling analysis. This version reflects updates in a number of areas to improve performance and address comments from the peer review. CMAQ simulates every hour of every day of the year and, thus, requires a

[45] More information regarding these hydrological units can be found through the USGS Web site *http://water.usgs.gov/GIS/huc.html.*

[46] The reference to ''zeroed out'' means that the modeled inventory did not include any amount of Hg emissions from utilities. This ''zero-out'' technique allows focus on the impact of the utilities alone.

variety of input files that contain information pertaining to the modeling domain and simulation period. These include hourly emissions estimates and meteorological data in every grid cell, as well as a set of pollutant concentrations to initialize the model and to specify concentrations along the modeling domain boundaries. These initial and boundary concentrations were obtained from output of a global chemistry model. We use the model predictions in a relative sense by first determining the ratio of Hg deposition predictions. The calculated relative change is then combined with the corresponding fish tissue concentration data to project fish tissue concentrations for the future case scenarios.

b. Modeling Domain and Simulation Periods. The modeling domain encompasses the lower 48 States and extends from 126 degrees to 66 degrees west longitude and from 24 degrees north latitude to 52 degrees north latitude. The modeling domain is segmented into rectangular blocks referred to as grid cells. The model actually predicts pollutant concentrations for each of these grid cells. For this application, the horizontal grid cells are roughly 36 km by 36 km. In addition, the modeling domain contains 14 vertical layers with the top of the modeling domain at about 16,200 meters. Within the domain each vertical layer has 16,576 grid cells.

The simulation periods modeled by CMAQ included separate full-year application for each of the emissions scenarios modeled.

c. Model Inputs. CMAQ requires a variety of input files that contain information pertaining to the modeling domain and simulation period. These include gridded, hourly emissions estimates and meteorological data and initial and boundary conditions. Separate emissions inventories were prepared for the 2001 base year and each of the future-year base cases and control scenarios. All other inputs were specified for the 2001 base year model application and remained unchanged for each future-year modeling scenario.

CMAQ requires detailed emissions inventories containing temporally allocated emissions for each grid cell in the modeling domain for each species being simulated. The previously described annual emission inventories were preprocessed into model-ready inputs through the emissions preprocessing system. Details of the preprocessing of emissions are provided in the Clean Air Interstate Rule Emissions Inventory Technical Support Document (Emissions Inventory TSD). Meteorological inputs reflecting 2001 conditions across the contiguous United States were derived from version 5 of the Mesoscale Model (MM5). These inputs include horizontal wind components (*i.e.*, speed and direction), temperature, moisture, vertical diffusion rates, and rainfall rates for each grid cell in each vertical layer.

The lateral boundary and initial species concentrations are provided by a three-dimensional global atmospheric chemistry and transport model (GEOS-CHEM). The lateral boundary species concentrations varied with height and time (every 3 hours). Terrain elevations and land use information were obtained from the U.S. Geological Survey database at 10 km resolution and aggregated to the roughly 36 km horizontal resolution used for this CMAQ application.

d. CMAQ Model Evaluation. An operational model performance evaluation for Hg wet deposition for 2001 was performed to estimate the ability of the CMAQ modeling system to replicate base-year wet deposition of Hg. Because measurements for the dry deposition of Hg do not currently exist, the modeled dry deposition performance could not be evaluated. The wet deposition evaluation principally comprises statistical assessments of model versus observed pairs that were paired in time and space on a weekly basis. This evaluation includes comparisons of model predictions to the corresponding weekly measurements from the Mercury Deposition Network (MDN).

As discussed in the TSD, in EPA's view, CMAQ model performance for wet deposition shows very good agreement with the MDN monitoring sites with an underprediction bias well within accepted performance criteria. It should be noted that the application of a sophisticated photochemical grid model like CMAQ has been demonstrated to be appropriate to support national and regional assessments of control strategies on atmospheric concentrations such as today's rule. Therefore, for purposes of assessing impacts on regional patterns of Hg deposition, we aggregate individual CMAQ grids to watersheds.

2. Emission Inventories and Estimated EGU (Utility Unit) Emission Reductions

As discussed in the Clean Air Mercury Rule Emission Inventory Technical Memorandum, EPA developed 2001 and 2020 Hg emission inventories for the air quality modeling. EPA relied on the 2001 Hg emission inventory as the base case. The base case consists of the level of Hg emissions, including Utility Unit emissions reduced by controls implemented for purposes of the acid deposition provisions and for other purposes, before reductions under CAIR (required under CAA section 110(a)(2)(D)) or CAMR (required under section 111). For comparison purposes, EPA also conducted an air quality modeling run of the 2001 Hg emissions inventories with Utility Units' Hg emissions ''zeroed out.'' EPA relied on the Integrated Planning Model (IPM), discussed below, to develop projections of EGU emissions for 2020. The 2020 utility Hg emission inventories reflect reductions under various control scenarios.

a. Use of IPM for Estimating Utility Unit Emissions. EPA projected future Hg emissions from the power generation sector using the IPM. The EPA uses IPM to analyze the projected impact of environmental policies on the electric power sector in the 48 contiguous states and the District of Columbia.

IPM is a multi-regional, dynamic, deterministic linear programming model of the U.S. electric power sector. The EPA used IPM to project both the national level and the unit level of Utility Unit Hg emissions under different control scenarios. The EPA also used IPM to project the costs of those controls.

As noted elsewhere, the CAIR SO_2 and NO_X controls provide the basis for reducing Hg to the CAIR co-benefit levels in 2010 and 2020. EPA assumed that states would choose to implement the CAIR-required SO_2 and NO_X reductions by controlling Utility Units, and by doing so through the EPA-administered cap-and-trade program. This assumption is reasonable, for present purposes, because of the cost-savings associated with the cap-and-trade program.

EPA used IPM to project the distribution within the utility industry of the emission controls to comply with CAIR. EPA then was able to use IPM to project the amount, and geographic distribution, of Hg emissions that would result from implementation of those CAIR-required emissions controls. In addition, EPA used IPM to project the geographic distribution of the additional emissions controls under section 111, and the associated costs.

In these IPM runs, EPA assumed that states would implement the Hg requirements through the Hg cap-and-trade program that EPA is establishing. EPA further assumed that the States would implement the additional reductions under section 111, beginning in 2010, through the same cap-and-trade program. The cap-and-trade program is implemented in two phases, with a cap

of 38 tons in 2010 (set at the co-benefits reduction under CAIR) and a lower cap of 15 tons in 2018. EPA modeling of section 111 projects banking of excess Hg reductions in the 2010 to 2017 timeframe for compliance with the cap in 2018 and beyond timeframe. Although states are not required to adopt the EPA-administered trading program, this program assures that those reductions will be achieved with the least cost. For that reason, EPA believes it reasonable to assume that States will adopt the program.

The National Electric Energy Data System (NEEDS) contains the generation unit records used to construct model plants that represent existing and planned/committed units in EPA modeling applications of IPM. The NEEDS includes basic geographic, operating, air emissions requirements, and other data on all the generation units that are represented by model plants in EPA's v.2.1.9 update of IPM.

The IPM uses model run years to represent the full planning horizon being modeled. That is, several years in the planning horizon are mapped into a representative model run year, enabling IPM to perform multiple year analyses while keeping the model size manageable. Although IPM reports results only for model run years, it takes into account the costs in all years in the planning horizon. In EPA's v.2.1.9 update of IPM, the years 2008 through 2012 are mapped to run year 2010, and the years 2013 through 2017 are mapped to run year 2015, and the years 2018 through 2022 are mapped to 2020.[47] Model outputs for 2009 and 2010 are from the 2010 run year. More detail on IPM can be found in the model documentation in the docket or at *http://www.epa.gov/airmarkets/epa-ipm* and more discussion of modeled scenarios can be found in the Regulatory Impact Assessment for CAIR and CAMR in the docket.

IPM has been used for evaluating the economic and emission impacts of environmental policies for over a decade. The model's base case incorporates title IV of the Clean Air Act (the Acid Rain Program), the NO_X SIP Call, various New Source Review (NSR) settlements, and several state rules affecting emissions of SO_2 and NO_X that were finalized prior to April of 2004. The NSR settlements include agreements between EPA and certain utilities. IPM also includes various current and future state programs in Connecticut, Illinois, Maine, Massachusetts, Minnesota, New Hampshire, North Carolina, New York, Oregon, Texas, and Wisconsin. IPM includes state rules that have been finalized and/or approved by a state's legislature or environmental agency. The base case is used to provide a reference point to compare environmental policies and assess their impacts and does not reflect a future scenario that EPA predicts will occur.

EPA's modeling is based on various input assumptions that are uncertain, particularly assumptions for Hg control technology, future fuel prices and electricity demand growth. While IPM contains an assumption of 90% Hg removal for ACI and, for modeling convenience, does not constrain the timeframe for the availability of technology, this should not be interpreted as implying any assessment of the availability of technology. For further discussion of the availability of Hg technology, see EPA's Office of Research and Development (ORD) Control of Emissions from Coal-Fired Electric Utility Boilers: An Update, EPA/Office of Research and Development, March 2005, in CAMR docket. There may also be technologies available for SO_2 and NO_X control that are not accounted for in IPM. Therefore the technologies that plants may use to comply with this program may not be accurately projected by IPM in all cases. These and other assumptions and uncertainties are discussed further in the RIA for CAIR and CAMR in the docket. More detail on IPM can be found in the model documentation, which provides additional information on the assumptions discussed here as well as all other assumptions and inputs to the model (see docket or *http://www.epa.gov/airmarkets/epa-ipm*).

b. Emission Estimates. The emission sources and the basis for current and future-year inventories are listed in Table VI–1. Table VI–2 summarizes the Hg emissions and the change in the emissions from EGUs (Utility Units) that we expect to result under the various EGU control scenarios (under CAIR and CAMR) that we used in modeling deposition changes.

TABLE VI—1. EMISSION SOURCES AND BASIS FOR CURRENT AND FUTURE-YEAR MERCURY INVENTORIES

Sector	Emissions source	2001 Base year	Future-year base case projections
EGU	Power industry electric generating units (EGUs).	1999 National Emission Inventory (NEI) data.	Integrated Planning Model (IPM).
Non-EGU point sources	Non-Utility Point	1999 NEI, with medical waste incinerator sources replaced with draft 2002 NEI.	(1) Department of Energy (DOE) fuel use projections, (2) Regional Economic Model, Inc. (REMI) Policy Insight® model, (3) decreases to REMI results based on trade associations, Bureau of Labor Statistics (BLS) projections and Bureau of Economic Analysis (BEA) historical growth from 1987 to 2002, (4) Maximum Achievable Control Technology category growth and control assumptions.
Non-point	All other stationary sources inventoried at the county level.	1999 NEI, with medical waste incinerator sources replaced with draft 2002 NEI.	Same as above.

This table documents only the sources of data for the U.S. inventory. The sources of data used for Canada and Mexico are explained in the technical support memorandum and were held constant from the base year to the future years.

[47] An exception was made to the run year mapping for an IPM sensitivity run that examined the impact of a NO_X Early Reduction Pool (ERP). In that run the years 2009 through 2012 were mapped to 2010 and 2008 was mapped to 2008.

TABLE VI—2. SUMMARY OF MODELED MERCURY EMISSIONS FOR CLEAN AIR MERCURY RULE

	Elemental mercury	Reactive gaseous mercury	Particulate mercury	Total mercury
2001 Base Case Emissions (tons)				
EGU Sources	26.26	20.58	1.73	48.57
Non-EGU Point Sources	37.85	13.33	7.60	58.78
Area Sources	5.05	1.53	0.96	7.54
All Sources	69.16	35.44	10.29	114.89
2001 Utility Mercury Emissions Zero-Out (tons)				
EGU Sources	0.00	0.00	0.00	0.00
Non-EGU Point Sources	37.85	13.33	7.60	58.78
Area Sources	5.05	1.53	0.96	7.54
All Sources	42.90	14.86	8.56	66.32
2020 With CAIR Emissions (tons)				
EGU Sources	25.72	7.87	0.83	34.42
Non-EGU Point Sources	28.03	10.37	6.61	45.01
Area Sources	5.69	1.30	0.77	7.76
All Sources	59.44	19.54	8.21	87.19
2020 With CAIR Utility Mercury Emissions Zero-Out				
EGU Sources	0.00	0.00	0.00	0.00
Non-EGU Point Sources	28.03	10.37	6.61	45.01
Area Sources	5.69	1.30	0.77	7.76
All Sources	33.72	11.67	7.38	52.77
2020 With CAIR and CAMR				
EGU Sources	17.65	6.57	0.83	25.05
Non-EGU Point Sources	28.03	10.37	6.61	45.01
Area Sources	5.69	1.30	0.77	7.76
All Sources	51.37	18.24	8.21	77.82
2020 With CAIR and Alternative CAMR Control Option				
EGU Sources	14.33	5.71	0.79	20.83
Non-EGU Point Sources	28.03	10.37	6.61	45.01
Area Sources	5.69	1.30	0.77	7.76
All Sources	48.05	17.38	8.17	73.60

(**Note:** ''Reactive Gaseous Mercury'' refers to oxidized mercury).

(**Note:** Table IV–2 includes projections for all EGUs, including other fossil-fired units, and coal-fired units that are less than 25 MW.)

c. Projected Hg Emissions. Table VI–3 provides projected total Hg emissions levels in 2010, 2015, and 2020. Because of the banking of excess emissions reductions under the first phase of the Hg program, emissions in the second phase will be initially higher than the caps that are required under CAMR.

TABLE VI—3. PROJECTED EMISSIONS OF HG WITH THE BASE CASE [a] (NO FURTHER CONTROLS), WITH CAIR, AND WITH SECTION 111 CONTROLS

[Tons]

	2010	2015	2020
Base Case	46.6	45.0	46.2
CAIR	38.0	34.4	34.0
CAMR	31.3	27.9	24.3
Alternative CAMR Control Option	30.9	25.7	20.1

[a] Base case includes Title IV Acid Rain Program, NO_X SIP Call, and state rules finalized before March 2004.
Source: Integrated Planning Model run by EPA.

Emissions projections are presented for affected coal-fired units.

(**Note:** Table VI–3 includes projections for all affected units, *i.e.*, coal-fired units greater than 25 MW.)

3. Effect of Reductions in Utility Unit Hg Emissions on Regional Patterns of Mercury Deposition and Fish Tissue Methylmercury Concentrations

EPA uses CMAQ to predict the effect of the various control scenarios on Hg deposition attributable to Utility Units within the 48 contiguous states. By averaging the 36 km CMAQ gridded deposition estimates to the watershed (*i.e.*, HUC–8) level, EPA is able to estimate the effectiveness of reductions in utility Hg emissions in achieving reductions in deposition attributable solely to Utility Units. In addition, by comparing changes in Hg deposition before and after implementation of rule requirements at the geographic location of the fish tissue sample points, EPA is able to estimate the effect of reductions in Hg deposition on fish tissue methylmercury concentrations at the sample points.

EPA generates these changes in Hg deposition by comparing two air modeling scenarios (*e.g.*, a control scenario versus a baseline scenario for a particular simulation year). EPA then translates these changes in Hg deposition into changes in methylmercury fish tissue concentrations based on a proportionality assumption: *i.e.*, an incremental percent change in deposition produces a matching percentage change in Hg fish tissue concentrations.[48]

EPA is able to use these modeled changes in methylmercury fish tissue concentrations, together with information about fish consumption, to predict changes in population-level Hg exposure. These exposure changes reveal the extent to which reductions in Utility Unit Hg emissions, and the extent to which remaining Utility Unit Hg emissions, affect public health.

F. Fish Tissue Levels of Methylmercury Modeled To Result After Implementation of CAIR and CAMR

This section describes the amounts of Utility Unit attributable Hg deposition onto watersheds (termed HUC), as well as the Utility-attributable methylmercury in fish tissue, all under the various control scenarios modeled.

1. Utility-Attributable Hg Deposition Patterns

The air quality modeling shows that total Hg deposition is not highly impacted by utility deposition. The small size of this impact is evident when utility emissions are, in effect, zeroed out in the 2001 base case. The following tables summarize impacts on total Hg deposition and Hg deposition attributable to Utility Units.

TABLE VI–4.—SUMMARY STATISTICS FOR TOTAL HG DEPOSITION

[Aggregated to the HUC–8 level]

	2001 Base case	2001 Utility zero out	2020 Base case (with CAIR)	2020 Utility zero out	2020 CAMR requirements	2020 CAMR alternative
Minimum	6.94	6.94	6.08	5.90	6.08	6.07
Maximum	54.54	54.38	62.76	62.72	62.76	62.75
50th percentile	15.92	14.60	14.59	13.92	14.44	14.39
90th percentile	22.16	19.48	19.46	19.04	19.37	19.33
99th percentile	32.35	27.20	29.15	28.93	28.96	28.95

(All units are expressed in micrograms per square meters.)

TABLE VI–5. SUMMARY STATISTICS FOR UTILITY ATTRIBUTABLE HG DEPOSITION

[aggregated to the HUC–8 level]

	2001 Base case	2020 Base case (with CAMR)	2020 CAMR Requirements	2020 CAMR Alternative
Minimum	0.00	0.00	0.00	0.00
Maximum	19.71	4.03	3.85	3.80
50th percentile	0.39	0.3	10.26	0.22
90th percentile	4.08	1.38	1.16	0.99
99th percentile	10.15	2.56	2.17	2.04

(All units are expressed in micrograms per square meters.)

The median deposition level is reduced by only 8 percent when utilities emissions are zeroed out in 2001, suggesting that utilities are not a major source of Hg deposition in most HUCs. Even so, at HUCs with the highest deposition levels, zeroing out utilities reduces the 99th percentile deposition level by 16 percent, suggesting that there are relatively larger impacts of utilities in high deposition areas.

By 2020, after implementation of CAIR, significant reductions in deposition attributable to utilities occurs. HUCs with high levels of utility deposition receive a larger reduction in Utility-attributable Hg deposition relative to HUCs with a relatively small level of Utility-attributable deposition. Specifically, CAIR results in a 75 percent reduction in the 99th percentile of Utility-attributable deposition, and a 20 percent reduction in the 50th percentile. CAIR also shifts the distribution of utility-attributable deposition. In the 2001 base case, 10 percent of HUCs had greater than 20 percent of deposition attributable to utilities. In the 2020 post-CAIR base case, no HUCs had greater than 20 percent of deposition attributable to utilities, and 90 percent had less than 9 percent of deposition attributable to utilities.

[48] US EPA, 2001. Mercury Maps: A Quantitative Spatial Link Between Air Deposition and Fish Tissue: Peer Reviewed Final Report. EPA–823–R–01–009. Mercury Maps is discussed at length in the TSD.

Additional reductions in Hg emissions due to the CAMR requirements result in relatively small additional shifts in the distribution of deposition. Additional emissions reductions due to the CAMR requirements result in a small additional reduction in the number of HUCs with a high percentage of utility-attributable emissions. (The incremental impact of the CAMR alternative relative to the promulgated CAMR requirements is very small.)

2. EGU-Attributable Methylmercury Fish Tissue Levels

The following tables summarize the methylmercury fish tissue levels associated with the various Utility Unit Hg emissions scenarios. All units refer to mg (of methylmercury) per kg (fish tissue), or parts per million (ppm). As a frame of reference, it should be noted that EPA's default water quality criterion is 0.3 mg/kg.

TABLE VI—6. SUMMARY STATISTICS FOR TOTAL FISH TISSUE METHYLMERCURY

[Sample locations]

	2001 Base case	2001 Utility zero out	2020 Base case CAIR	2020 Zero out	2020 CAMR requirements	2020 CAMR alternative
Minimum	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	4.49	3.64	3.65	3.46	3.63	3.61
50th percentile	0.25	0.21	0.21	0.20	0.21	0.21
90th percentile	0.90	0.81	0.79	0.77	0.79	0.78
99th percentile	1.80	1.65	1.64	1.57	1.63	1.63

(All units are in mg methylmercury per kg fish tissue.)

TABLE VI—7. SUMMARY STATISTICS FOR UTILITY ATTRIBUTABLE FISH TISSUE METHYLMERCURY

[Across sampling locations]

	2001 Base	2020 (with CAIR)	2020 CAMR Requirements	2020 CAMR Alternative
Minimum	0.00	0.00	0.00	0.00
Maximum	0.85	0.25	0.19	0.18
50th percentile	0.03	0.01	0.01	0.01
90th percentile	0.11	0.03	0.03	0.03
99th percentile	0.26	0.10	0.09	0.08

(All units are in mg methylmercury per kg fish tissue.)

a. 2001 Base case and 2001 Utility Zero-out. In the 2001 base case, as a result of all international and U.S. emissions, and before U.S. utilities implement reductions from CAIR or CAMR, the 50th percentile of the sample points had an estimated methylmercury fish tissue concentration of 0.25 mg/kg. The 90th percentile water body had an estimated methylmercury fish tissue concentration of 0.90 mg/kg, and the 99th percentile had 1.80 mg/kg.

The amount of methylmercury attributable solely to utilities in the 2001 base case, which becomes evident when utilities are zeroed out, is of course much smaller. The 50th percentile of the sample points had an estimated methylmercury fish tissue concentration. attributable solely to utilities, of 0.03 mg/kg. The 90th percentile had 0.11 mg/kg, the 99th percentile had 0.26 mg/kg, and the maximum individual sample point had 0.85 mg/kg.

It should be recalled that EPA recommends the water quality criterion of 0.3 mg/kg as a level that, given fish consumption at the 90th percentile level, would result in exposure levels below the RfD. For present purposes, EPA does not consider the water quality criterion of 0.3 mg/kg as a bright-line test for evaluating fish tissue methylmercury levels attributable to U.S. Utility Units. Rather, the criterion serves as establishing a broad frame of reference, that serves to place into context both the overall methylmercury fish tissue levels (which are attributable to methylmercury from all sources) and the methylmercury levels attributable to Utility Units.

These results indicate the relatively small percentage of U.S. utility contribution to U.S. fish tissue methylmercury levels.

b. 2020: Utilities With CAIR Reductions. EPA's modeling shows that in 2020, as a result of all international and U.S. emissions, and with U.S. utilities implementing reductions from CAIR (but not CAMR), the 50th percentile of the sample points is projected to have a methylmercury fish tissue concentration of 0.21 mg/kg. The 90th percentile is projected to have 0.79 mg/kg, and the 99th percentile is projected to have 1.64 mg/kg.

The amount of methylmercury in fish attributable solely to utilities in 2020, after implementation of the CAIR reductions (but, again, before CAMR), of course is smaller. The 50th percentile of the sample points is projected to have fish tissue concentration, attributable solely to utilities of 0.01 mg/kg. The 90th percentile is projected to have 0.03 mg/kg, the 99th percentile is projected to have 0.10 mg/kg, and the maximum individual sample point (*i.e.*, the one with the highest methylmercury levels) is projected to have 0.25 mg/kg.

Again, using the 0.3 mg/kg methylmercury water quality criterion as a broad frame of reference serving to place in context both the overall methylmercury fish tissue levels (attributable to methylmercury from all sources) and the methylmercury fish tissue levels attributable to Utility Units, it is clear that the latter levels, following implementation of CAIR, are low.

c. 2020: Utilities with CAMR Controls. The CAMR level of controls achieve further, albeit small, reductions in methylmercury fish tissue concentrations. Compared to the CAIR controls, the CAMR controls would further reduce, in 2020, methylmercury fish tissue concentrations by, in the 99th percentile, 0.01 mg/kg.

d. 2020: Utilities with Alternative CAMR Controls. EPA evaluated, but did not adopt, a slightly tighter level of CAMR controls. These alternative

CAMR controls would have achieved still further, albeit, again small, reductions in Hg deposition and in fish tissue methylmercury levels. Compared to the CAIR controls, these alternative CAMR controls would reduce methylmercury fish tissue levels in 2020 by, in the 99th percentile, 0.02 mg/kg.[49]

5. Overall Impact of CAIR and CAMR Controls on Utility Unit Hg Emissions

As described in the CAIR rule, CAIR reduces EGU Hg emissions from pre-CAIR levels by a substantial percentage. CAMR reduces Utility Unit Hg emissions, from CAIR levels, by 27 percent. CAMR reduces ionic Hg emissions, those that are most likely to result in local and regional deposition, by 17 percent relative to CAIR levels.

These reductions tend to occur from the largest sources. That is, the larger the source of Hg emissions, the more likely it is to implement CAIR or CAMR controls, and therefore the more likely it is to reduce its Hg emissions. More specifically, under the cap-and-trade system, the marketplace tends to direct controls to the largest emitters because those emitters can achieve the most cost-effective reductions. Compared to smaller emitters, these larger emitters have an incentive to implement more stringent controls, thereby reducing their emissions further below the level of their allowances, and thereby generating a larger number of allowances for sale to defray control costs. See ''Proposed National Emissions Standards for Hazardous Air Pollutants; and in the Alternative, Proposed Standards of Performance for New and Existing Sources: Electric Utility Steam Generating Units,'' 9 FR 4652, 4702–03 (Jan. 30, 2004).

G. Exposure to Utility-Attributable Methylmercury Levels in Fish Tissue

CAIR reduces median Utility-attributable fish tissue methylmercury levels, from pre-CAIR levels, by 67 percent. CAIR reduces the 99th percentile Utility-attributable fish tissue methylmercury levels, from pre-CAIR levels, by 60 percent. CAMR reduces median Utility-attributable fish tissue methylmercury levels, from CAIR levels, by 12 percent. CAMR reduces the 99th percentile Utility-attributable fish tissue methylmercury levels, from CAIR levels, by 9 percent.

As a result of these reductions, after CAIR or CAMR, no sample site remains in which Utility-attributable, emissions cause methylmercury fish tissue levels to exceed 0.3 mg/kg (EPA's water quality criterion).

Even with these reductions, although the levels of methylmercury in fish tissues attributable to Utility Units are small, the magnitude of methylmercury exposure depends on consumption levels and the sensitivity of the individual. For purposes of assessing whether utility Hg emissions are reasonably anticipated to result in hazards to public health, we focused on evaluating utility attributable methylmercury exposures for women of childbearing age in the general U.S. population who consume non-commercial (*e.g.,* recreational) freshwater fish in U.S. waterbodies.

This section describes available information as to the consumption levels of women of child-bearing age within the population of recreational fishers who consume at typical levels, and within high-consumption sub-populations; and discusses the amounts of methylmercury that may be ingested as a result of those consumption levels.

1. General Population

We believe that only those women of childbearing age who consume noncommercially caught U.S. freshwater fish have the potential for significant exposures to utility-attributable methylmercury. As a result, our assessment of the hazards to public health focuses on those women.

2. Recreational Fishers Who Consume Fish At Typical Levels.

a. Consumption Levels. For our analysis of recreational freshwater fish consumption, EPA has determined that the sport-caught fish consumption rates for recreational freshwater fishers specified as ''recommended'' in the EPA's Exposure Factors Handbook (mean of 8 gm/day and 95th percentile of 25 gm/day), represent the most appropriate values for present purposes. These recommended values were derived based on ingestion rates from four studies conducted in Maine, Michigan, and Lake Ontario (Ebert *et al.,* 1992; Connelly *et al.,* 1996; West *et al.,* 1989; West *et al.,* 1993). These studies are suitable because they included information for annual-averaged daily intake rates for self-caught freshwater fish by all recreational fishers including consumers and non-consumers. The mean values presented in these four studies ranged from 5 to 17 gm/day, while the 95th percentile values ranged from 13 to 39 gm/day.[50]

The EPA ''recommended values'' were developed by considering the range and spread of means and 95th percent values presented in the four studies. EPA recognizes that use of mean and 95th percentile consumption rates based on these four studies may not be representative of fishing behavior in every state and that there may be regional trends in consumption that differ from the values used in this analysis. However, EPA believes that these four studies represent the best available data for developing recreational fisher ingestion rates for present purposes.

As a result, for today's purposes of evaluating the potential for health effects for consumers of recreational freshwater fish resulting from exposure to utility-attributable methylmercury, we consider both the mean of 8 gm/day consumption and the 95th percentile amount of 25 gm/day.

b. Levels of Consumption Combined with Levels of Utility-Attributable Methylmercury in Fish Tissue. As described above, fish tissue levels of Utility-attributable methylmercury, for virtually all sample points, are only a fraction of the 0.3 mg/kg (fish tissue) water quality criterion. EPA evaluated recreational fish consumers' exposure to this Utility-Attributable methylmercury by calculating the level of exposure to this methylmercury and comparing it to the RfD when background exposures are not considered. For the purposes of assessing population exposure due solely to power plants, we create an index of daily intake (IDI).The IDI is defined as the ratio of exposure due solely to power plants to an exposure of 0.1 μug/kg bw/day. The IDI is defined so that an IDI of 1 is equal to an incremental exposure equal to the RfD level, recognizing that the RfD is an absolute level, while the IDI is based on incremental exposure without regard to absolute levels. Note that an IDI value of 1 would represent an absolute exposure greater than the RfD when background exposures are considered.

At either the mean fish consumption rate of 8 gm/day or the 95th percentile fish consumption rate of 25 gm/day for recreational fish consumers discussed above, and using the 99th percentile methylmercury fish tissue concentration attributable to Utility Unit (and a typical body weight of 64 kg for women of child-bearing age), the calculated Utility-attributable methylmercury exposures are 0.013 μug/kg body weight per day and 0.04 μug/kg body weight per day, respectively. Both calculated exposures are well below the RfD of 0.1 μug/kg body weight per day (an IDI value well below 1).

[49] A detailed discussion of the control alternatives we considered and the reason for our final selection is contained in the preamble to the final CAMR.

[50] The 39 gm/day value actually represents a 96th percentile value.

EPA uses the RfD to place ingestion levels in context. The RfD level of methylmercury ingestion—0.1 µug/kg body weight—should not be considered a bright line standard above which adverse health effects occur, but rather as an aid in establishing the context for evaluating both overall methylmercury ingestion (arising from methylmercury from all sources) as well as Utility-Attributable methylmercury ingestion in light of consumption rates. Our analysis concludes that Utility Unit Hg emissions do not cause hazards to the health of the general public or higher fish consuming recreational anglers.

3. High-Level Fish Consumption Sub-Populations

Although exposure to Utility-attributable methylmercury from freshwater fish tissue is quite low for recreational fishers generally, as just described, EPA recognizes that certain sub-populations consume higher levels of U.S. freshwater fish. These populations may include a subset of recreational fishers who consume large quantities of fish, individuals who are subsistence fishers, and individuals who are part of certain ethnic groups. EPA is aware that at very high consumption levels, even relatively small concentrations of methylmercury in fish may result in exposures that exceed the RfD.

However, as described in the TSD, characterization of fish consumption rates for the highest fish consuming subpopulations (*e.g.,* Native American and other ethnic populations exhibiting subsistence-like consumption) in the context of a larger regional or national analysis is technically challenging. Peer reviewed study data on these populations is relatively limited, especially when subjected to the criteria outlined in the TSD. Many of the high consumption groups that have been studied are located near the ocean and consequently have a significant fraction of their overall exposure comprised of saltwater fish. In addition, some of these studies provide details on seasonal consumption rates, but do not integrate these rates to provide an overall mean annual-averaged consumption rate relevant to an RfD-based analysis.

Although many of these studies provide mean consumption rates, few have identified specific high-end percentile values (*e.g.,* 90th, 95th or 99th percentile consumption rates). Instead, many studies, including a number of non-peer reviewed sources, cite non-specific high-end or bounding point estimates (*e.g.,* the range of consumption rates for the Ojibwe submitted for the CAMR NODA). While these point values can be used in developing high-end bounding scenarios for evaluating risk to these groups, they do not support population-level analysis of exposure since they cannot be used to fit distributions characterizing variability in fish consumption rates across these sub-populations (as noted above, modeling of population-level exposures requires that distributions characterizing fish consumption rates across a particular population be developed).

An additional challenge in characterizing high-level fish consumption is that care needs to be taken in extrapolating study results from one group to another. This reflects the fact that high-level fish consumption is often tied to socio-cultural practices and consequently consumption rates for a study population cannot be easily transferred to other groups which may have different practices (*e.g.,* practices for one Native American tribe may not be relevant to another and consequently behavior regarding fish consumption may not be generalized).

Despite these challenges in characterizing high-level consumption, EPA has developed recommended subsistence-level fish consumption rates of 60 g/day (mean) and 170 g/day (95th percentile) (EPA, 1997, Exposure Factors Handbook). These values are based on a study of several Native American Tribes located along the Columbia River in Washington State. Although these consumption rates are specific to the tribes included in the study and reflect their particular socio-cultural practices (including seasonality and target fish species), EPA believes that this study does provide a reasonable characterization of high-consuming subsistence-like freshwater fishing behavior (EPA, 1997, Exposure Factors Handbook). Therefore, in the absence of data on local practices, EPA recommends that these consumption rates be used to model high-consuming groups in other locations. It is important to note that, as explained above, application of these subsistence consumption rates outside of the original Columbia River study area could be problematic because it would be difficult to transfer these consumption rates to a different group that might exhibit different fishing behavior. However, these recommended rates can be used to model subsistence scenarios at different locations.

Although these subsistence consumption rates are recommended by EPA, commenters (including NODA comments obtained for this rule), have identified alternative consumption rates for specific high consuming groups that are in some instances, higher than these recommended values. For example, a survey by the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) (as referenced in comments to the CAMR NODA) indicates that consumption rates by members of Ojibwe Great Lakes tribes during fall spearing season may range from 155.8–240.7 g/day and may range from 189.6–292.8 g/day during the spring. EPA has reviewed these comments and does not believe that it would be appropriate to rely on them for purposes this rulemaking. First, the data has not been peer reviewed. Moreover, it is not clear from the comments how many people consume fish at those rates, to what extent those fish consumers are women of child-bearing years, and how to annualize these seasonal sales.[51]

For all the above reasons, and despite comments indicating that some subgroups may have larger short-term consumption rates, EPA believes that the Columbia River-based consumption rates of between 60 g/day (mean) and 170 g/day (95th percentile) are appropriate default values for subsistence fish consumers.

H. EPA Concludes That Utility Hg Emissions Remaining After Imposition of Other Requirements of the Act, in Particular CAA Sections 110(a)(2)(D) and 111, Do Not Result in Hazards to Public Health

As discussed above, Congress mandated that EPA assess hazards to public health reasonably anticipated to occur as a result of utility HAP emissions remaining after imposition of the requirements of the Act, and to regulate Utility Units under section 112 if EPA determines that such regulation is ''appropriate'' and ''necessary.'' The issue of whether the level of Hg emissions from Utility Units remaining after implementation of CAA section 110(a)(2)(D), and independently section 111, cause hazards to public health is directly relevant to our conclusion set forth in section IV.A. above, namely, that it is not appropriate to regulate coal-fired Utility Units under section 112 on the basis of Hg emissions. For the reasons discussed below, EPA concludes that the level of Hg emissions remaining after implementation of CAIR, and, independently, CAMR, which implement sections 110(a)(2)(D) and 111, respectively, do not result in hazards to public health.

1. ''Hazards to Public Health'' Under Section 112(n)(1)(A)

[51] As discussed below, the Ojibwe Great Lakes tribes do not appear to be located in areas with high utility-attributable Hg deposition.

Section 112(n)(1)(A) establishes the backdrop against which our utility ''appropriate and necessary'' determination should be judged. Again, we must decide whether we reasonably anticipate utility Hg emissions remaining after imposition of the requirements of the Act to cause hazards to public health. If they do, then we must determine whether it is appropriate and necessary to regulate Utility Units under section 112. If utility Hg emissions do not cause public health hazards, however, which indeed is what we conclude today, then it is not appropriate to regulate such emissions under section 112, and there is no need to proceed to the ''necessary'' prong of the section 112(n)(1)(A) inquiry, as explained above.

Section 112(n)(1)(A) defines neither what constitutes a ''hazard'' to public health nor what EPA's obligations would be if such hazard were identified. Therefore, we believe that EPA has wide discretion, using its technical expertise, to define ''hazards to public health,'' and to determine whether Hg emissions from utilities pose such a hazard. EPA's judgment should only be overturned if it is deemed unreasonable, not merely because other, reasonable alternatives exist. *Department of Treasury* v. *FLRA,* 494 U.S. 922, 933 (1990); *Texas Office of Public Utility Counsel* v. *FCC,* 265 F.3d 313, 320 (5th Cir. 2001).

Although section 112(n)(1)(A) does not define ''hazards to public health,'' section 112(n)(1)(C) offers guidance with respect to determining whether Hg emissions result in hazards to public health. In that section, Congress asked the National Institute of Environmental Health Sciences to conduct a study to determine the ''threshold level of mercury exposure below which adverse *human health* effects are not expected to occur.'' (Emphasis added) Congress further mandated that the study include a threshold for Hg concentrations in fish tissue which may be consumed, including consumption by *''sensitive populations''* without adverse effects on *public health.* Implicit in this direction, is that Congress was concerned, first about public health, not environmental effects. EPA has identified the exposure to Hg through consumption of contaminated fish as a pathway to human health effects, and EPA has also, in its discretion, looked at the health effects on sensitive populations.

In interpreting what ''hazards to public health'' might be reasonably anticipated under section 112(n)(1)(A), we think it is also useful to look at the DC Circuit's Vinyl Chloride decision, 824 F.2d 1146 (1987), and the analysis EPA articulated in its so-called ''benzene'' analysis, 54 FR 38044 (Sept. 14, 1989). Although the Vinyl Chloride decision and ''benzene'' analysis address the issue of how to protect public health ''with an ample margin of safety,'' and are thus more stringent than the standard established in section 112(n)(1)(A), we nevertheless believe that the general principles articulated in Vinyl Chloride and the ''benzene'' analysis are relevant to our analysis of assessing hazards to public health pursuant to section 112(n)(1)(A). Some of those key principles include: (1) ''Safe'' does not mean ''risk free,'' (Administrator is to determine what risks are acceptable in the world in which we live, where such activities as driving a car are considered generally safe notwithstanding the known risk involved), Vinyl Chloride, 824 F.2d at 1165; (2) something is '' 'unsafe' only when it threatens humans with a significant risk of harm,' '' *id.* at 1153; (3) EPA, not the courts, has the technical expertise to determine what risks are acceptable, *id.* at 1163; (4) EPA is permitted to account for uncertainty and to use ''expert discretion to determine what action should be taken in light of that uncertainty,'' *id.;* and (5) in determining what is ''safe'' or ''acceptable,'' EPA should consider a variety of factors, including: (a) Estimated risk to a maximally exposed individual (the so-called ''maximum individual risk'' or ''MIR''); (b) overall incidence of cancer or other serious health effects within the exposed population; (c) the numbers of persons exposed within each individual lifetime risk range; (d) the science policy assumptions and uncertainties associated with the risk measures; (e) weight of the scientific evidence for human health effects; and (f) other quantified or unquantified health effects. (See 54 FR at 38045–46, 38057).

In assessing whether remaining utility HAP emissions pose hazards to public health, consistent with section 112(n)(1)(C) and the above identified factors, we looked at the public's, including sensitive populations' (*i.e.,* fish consumers), exposure to methylmercury through fish consumption attributable to utilities alone. Based on this assessment, and as explained further below, EPA concludes that remaining utility HAP emissions do not pose hazards to public health.

2. CAIR and CAMR Reduce the Public's Methylmercury Exposure Due to Fish Consumption to Below the Methylmercury RfD (Below an IDI Value of 1)

As discussed above, EPA has adopted a water quality criterion for methylmercury for states to use in establishing water quality standards to protect public health. The criterion, expressed as a fish tissue concentration, of 0.3 mg/kg was derived from the methylmercury RfD (taking into account the possibility that a person may be exposed to methylmercury via commercial fish to some degree, as expressed in the RSC described elsewhere). At this level, people consuming at a high-end fish consumption rate of 17.5 grams per day would not be exposed above the methylmercury RfD. As noted above, this value represents the 90th percentile fish consumption rate.

In the base year of 2001 (*i.e.*, prior to both CAIR and CAMR), fish-tissue methylmercury concentrations at the 90th percentile, 99th percentile, and maximum (that is, the single highest concentration) levels, attributable to utilities, are 0.11, 0.27, and 0.85 mg/kg, respectively. CAIR reduces the utility-attributable methylmercury fish-tissue concentrations at the 90th percentile, 99th percentile, and maximum level to 0.03, 0.10, and 0.25 mg/kg, respectively. CAMR reduces these concentrations even further to 0.03, 0.09, and 0.19 mg/kg, respectively. These post CAIR and CAMR levels are considerably below the methylmercury water quality criterion of 0.3 mg/kg.

At all of these post-control methylmercury levels, fish consumers at the water quality criterion 90th percentile consumption level of 17.5 grams per day are well below the RfD (below an IDI value of 1). Further, these concentration values when applied to the 95th percentile consumption rate for recreational freshwater anglers identified in EPA's Exposure Factors Handbook, *i.e.,* 25 grams per day, also result in exposures below the RfD (below an IDI value of 1). As a result, it is evident that the general population (which is expected to consume less U.S. freshwater fish than recreational anglers) does not confront hazards to public health from utility-attributable methylmercury.

At the methylmercury fish tissue concentrations attributable to utilities remaining after implementation of CAIR and CAMR, it is possible that consumers eating at the subsistence-level fish consumption rates of 60 g/day (mean) and 170 g/day (95th percentile), see Exposure Factors Handbook, could exceed the RfD (an IDI value greater than 1) as a result of utility-attributable emissions if they are in fact consuming fish from the most contaminated locations. In other words, for a fish consumer to exceed the RfD (an IDI value greater than 1) as a result of utility

Hg emissions, they have to both (1) consume fish at the highest consumption rates and (2) consume fish from waterbodies with the highest levels of utility-attributable Hg fish-tissue concentrations. As discussed in the TSD, the probability of these factors converging is quite low. For example, after CAIR, the probability that a recreational angler will exceed the RfD (an IDI value greater than 1) exclusively as a result of utility Hg emissions is only 0.01 percent. After CAMR, the probability drops even lower. Our analysis further shows that even if there were a convergence of the unlikely factors of consuming at the 99th percentile consumption rates and at the 99th percentile methylmecury fish tissue concentrations, exposure would exceed the RfD by only 10 percent (an IDI value of 1.1). Exceeding the RfD by this amount (an IDI value of 1.1) does not mean that an adverse effect will occur. Indeed, 10 percent above the RfD (an IDI value of 1.1), or 0.11 µg/kg-bw/day, is below the World Health Organization's level of 0.23 µg/kg-bw/day.[52]

Consumption rates for subsistence fishers are much higher than recreational anglers. As such, these populations have a greater probability of exceeding the RfD (an IDI value greater than 1). For this to happen, the subsistence fisher still must be at the high-end of the distribution for both consumption and utility-attributable methylmercury fish tissue concentrations. Our statistical data suggest that subsistence anglers at the 99th percentile consumption rate and the 99th percentile concentration level could exceed the RfD (an IDI value greater than 1). Holding consumption rates at the 99th percentile, the subsistence angler will likely exceed the RfD (an IDI value greater than 1) at or above the 72nd percentile fish tissue concentration.

Again, the likelihood of this occurring is very small. Specific data on concentrations in fish at waterbodies frequented by subsistence fishing populations has not been generated. To get a sense of tribal location in relation to utility-attributable Hg deposition post-CAIR, we overlaid the 2000 Census data on the location of Native American populations (by census tract) on our CMAQ models. Visual inspection of the resulting map shows that the overwhelming majority of tribal populations live outside of areas most impacted by utility-attributable Hg deposition. *See* TSD. This suggests that the 99th percentile of the utility attributable methylmercury concentrations is likely inappropriate as an upper bound for Native American exposures, further reducing the probability that, post CAIR, and even more so, post CAMR, an individual Native American (who comprise a significant percent of upper-bound subsistence anglers) will exceed the RfD (an IDI value greater than 1).

As discussed above, EPA received comments on the consumption rates of certain ethnic groups that are higher than the subsistence angler consumption rate that EPA relied on for purposes of this analysis. Specifically, members of the Ojibwe Great Lakes Tribes commented that during their fall spearing season they may consume between 156 and 241 grams of fish per day, and during their spring spearing season, they may consume as much as 293 grams/day. For a number of reasons, EPA found the data to be of limited value. First, the data have not been peer reviewed and thus EPA is reluctant to rely on them for regulatory purposes. Second, commenters did not include information on annual average consumption rates or the percentage of those fish consumers that are women of childbearing age. Third, based on EPA's information, the Tribes do not reside in an area that appears to be significantly impacted by utility Hg emissions. Thus, despite having extremely high consumption rates, there are no data in the record that suggest that members of the Tribe would be exposed above the RfD (an IDI value greater than 1) as a result of utility emissions. And again, as discussed in greater detail below, exposure above the RfD does not necessarily equate to adverse effects.

3. The RfD Is An Appropriate Health Benchmark

As described in section VII.B., in general, the RfD is ''an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.'' [53] EPA's RfD for Methylmercury is 0.1 µg/kg bw/day, which is 0.1 microgram of Hg per day for each kilogram of a person's body weight. Since the most sensitive subpopulations are factored into the RfD, its use is thought to be protective of all life stages without additional uncertainty factors or adjustments. The National Academy of Sciences (NAS) reviewed the toxicological effects of Methylmercury and concluded that ''[o]n the basis of its evaluation, the committee's consensus is that the value of EPA's current RfD for Methylmercury, 0.1 µg/kg per day, is a *scientifically justifiable level for the protection of public health.*'' [54]

EPA views the level of the RfD as establishing the overall context for assessing the health effects of ingesting utility-attributable Methylmercury. As noted above, in regulating HAPs that constitute threshold pollutants, EPA has stated that the risks associated with exposures below the RfD generally should be considered to be acceptable, and that the emissions associated with those exposures need not be regulated further under section 112.

However, the RfD should not be considered a bright line. At exposures above the RfD, ''adverse health effects are possible,'' but such exposures ''[do] not necessarily mean that adverse effects will occur.'' Indeed, the World Health Organization has concluded that a level equal to 2.3 times EPA's Methylmercury RfD is protective of human health.

4. Risks Remaining After Implementation of CAIR, and Even More So After CAMR, Are Acceptable

Applying the risk factors identified above to utility Hg emissions in the 112(n)(1)(A) context, EPA concludes that utility Hg emissions remaining after implementation of CAIR, and even more so after CAMR, do not pose unacceptable hazards to public health. The overwhelming majority of the general public and high-end fish consumers (at least through the 99th percentile of recreational anglers) are not expected to be exposed above the methylmercury RfD (an IDI value greater than 1). While the possibility exists that a very small group of people may be exposed above the RfD (an IDI value greater than 1), significant uncertainties exist with respect to the existence and

[52] The choice of an ''acceptable'' risk level is one of policy informed by science. The RfD does not represent a ''bright line'' above which individuals are at risk of significant adverse effects. Rather, it reflects a level where EPA can state with reasonable certainty that risks are not appreciable. The Agency further notes that a number of other national and international scientific bodies have assessed the health effects of Hg and have adopted levels greater than EPA's RfD. As exposure levels increase beyond the RfD, the possibility of deleterious effects increases, but the point at which they become ''unacceptable'' must be determined on a case-by-case basis. In making this determination, the Agency considers a number of factors including: (1) Confidence in the risk estimate: How certain is the scientific information supporting the link between possible health effects and exposures?; (2) the effects of concern: How serious are the health effects?; (3) the size of the population at risk, as well as the distribution of risk within the population. The Agency has considered these factors in the case of Hg and has concluded that the exposures above the IDI described elsewhere in this chapter do not constitute an unacceptable risk.

[53] *See http://www.epa.gov/iris/subst/0073.htm.*

[54] *See* NAS at page 11 (emphasis added).

actual size of such a group. There are also significant uncertainties concerning the extent to which such exposure might exceed the RfD (an IDI value greater than 1) and whether exposure at such levels would cause adverse effects. *See* TSD. EPA intends to continue to investigate the size and extent to which certain groups might be exposed above the RfD (an IDI value greater than 1), and reserves the right to revisit its risk acceptability determination if future information warrants.

In the meantime, however, given the size of the population, including sensitive subpopulations, that after implementation of CAIR and, independently, CAMR, will be below the RfD (an IDI value of less than 1); the uncertainty of the size and the level to which certain groups may be exposed above the RfD (an IDI value greater than 1); the uncertainties that adverse effects will be experienced by such groups even at levels significantly above the methylmercury RfD (an IDI value greater than 1); and the nature of those potential adverse effects (see TSD), EPA, in its expert judgment, concludes that utility Hg emissions do not pose hazards to public health, and therefore that it is not appropriate to regulate such emissions under section 112.

5. Section 112(f) ''Residual Risk'' Analysis

Some commenters have argued that, in determining whether utility HAPs pose a hazard to public health, EPA is bound to the mandates of section 112(f). In other words, some have argued that unless we can conclude that the imposition of the CAA requirements on utility HAP emissions ''provide[s] an ample margin of safety to protect public health,'' we must regulate utilities under section 112. We disagree. Section 112(n)(1)(A) governs our decision whether to regulate utilities under section 112, not 112(f). Had Congress intended us to apply the same standard, it could have used identical words to those found in section 112(f) or referenced it directly. It did not. Instead, Congress instructed EPA to assess whether utility HAP emissions cause ''hazards to public health.''

Nevertheless, as explained above, in assessing whether remaining utility HAP emissions cause ''hazards to public health,'' EPA used essentially the same analysis that it would use in assessing the human health prong of a 112(f) determination.[55] The factors laid out in the ''benzene'' analysis for assessing acceptable risk to public health under 112(f) are generally relevant to assessing hazard under 112(n)(1)(A). Thus, even if EPA were required to do a 112(f) analysis in determining whether utility Hg emissions pose public health hazards, it is very likely that the conclusion would have been the same, even if the methodology might have been slightly different.

As noted above, section 112(f) expressly incorporates EPA's pre-1990 two-part inquiry for evaluating what level of emission reduction is needed to provide an ample margin of safety to protect public health. See CAA section 112(f)(2)(B) (incorporating EPA's two-part ample margin of safety inquiry, set forth at 54 FR 38044 (Sept. 14, 1989), which implemented the requirements of section 112 of the 1977 CAA). Under this approach, we must first determine what level is ''acceptable'' based exclusively upon the Administrator's determination of the risk to health at a particular emission level. Vinyl Chloride, 824 F.2d at 1164.[56] The Court stressed, however, that ''safe'' in this context does not mean ''risk-free.'' Rather, the Agency must make a determination about what is safe ''based upon an expert judgment with regard to the level of emission that will result in an ''acceptable'' risk to health,'' taking into account the many every day activities that entail health risks but are not considered to be unsafe. *Id.* at 1165.

In this regard, we also note that section 112(f) makes a distinction between pollutants classified as ''known, probable or possible carcinogens'' and other hazardous air pollutants such as Hg. For possible carcinogens, the Agency must set a residual risk standard if ''the individual most exposed to emissions from a source'' is subject to a risk above a certain level. This additional requirement does not apply to other hazardous air pollutants. Therefore, in determining whether any level of Hg emission is 'acceptable' under 112(f), we would use the same basic approach we have used in this case. Although we would evaluate the risk to the maximum exposed individual, which we essentially did for purposes of assessing the hazards posed by utility emissions under section 112(n)(1)(A), we believe that ''the distribution of risks in the exposed population, incidence, the science policy assumption and uncertainties associated with the risk measures, and the weight of evidence that a pollutant is harmful to health are [also] important factors to be considered'' in making a decision as to whether a given level of emissions is acceptable. 54 FR at 38044.

Then, ''[i]n the ample margin decision [the second step], the Agency again considers all of the health risk and other health information considered in the first step. Beyond that information, additional factors relating to the appropriate level of control will also be considered, including costs and economic impacts of controls, technological feasibility, uncertainties, and any other relevant factors.'' 54 FR 38046.

As explained in section H.3. above, applying the general principles articulated in the Vinyl Chloride decision and the benzene rule, the Agency has concluded that power plant Hg emissions remaining after CAIR, and even more so after CAMR, do not pose hazards to public health. This determination was based on health considerations alone, as would be the case under the first step of a 112(f) analysis. Under the second step of a 112(f) analysis, we would then consider both the benefits and costs of further emission reductions. Based on what we know about the uncertainties and nature of the potential adverse effects associated with Hg exposure, the extent to which the public, including sensitive subpopulations, is exposed to Hg, and the extent to which such exposure could be reduced by further reducing Hg emissions from U.S. power plants, we have concluded that the cost of requiring further reductions in Hg emissions from power plants would significantly outweigh any benefits. Therefore, if we were proceeding under section 112(f), we would likely conclude that CAIR, and even more so CAMR, not only protects public health, but does so with an ''ample margin of safety.''

I. The Final CAMR Will Not Lead to Localized ''Utility Hot Spots''

1. What Is a ''Utility Hot Spot''?

As we said in the preamble to the proposed rule, Hg emissions from power plants sometimes are deposited locally near the plant (*i.e.*, within 25 km),

[55] It should be noted that section 112(f) requires consideration of effects on the environment in addition to human health. In contrast, 112(n) requires a narrower assessment.

[56] The Vinyl Chloride court did note, however, that under certain circumstances it might be appropriate to combine the two steps into one. Specifically, the court stated that ''[i]f the Administrator finds that some statistical methodology removes sufficiently the scientific uncertainty present in this case, then the Administrator could conceivably find that a certain statistically determined level of emissions will provide an ample margin of safety. If the Administrator uses this methodology, he cannot consider cost and technological feasibility: these factors are no longer relevant because the Administrator has found another method to provide an 'ample margin' of safety.'' 824 F.2d at 1165, fn 11.

specifically emissions of oxidized and particulate Hg. Nearby waterbodies may be a source of fish consumption for recreational and/or subsistence fishers, and thus local Hg deposition in nearby waterbodies could be a source of what some refer to as ''hot spots.'' In the proposed rule, we suggested that a ''power plant may lead to a hot spot if the contribution of the plant's emissions of Hg to local deposition is sufficient to cause blood Hg levels of highly exposed individuals near the plant to exceed the RfD.'' (*See* 69 FR 4702.)

Based on additional analysis and consideration of the ''hot spot'' issue and to ensure that stakeholders have a common understanding of how EPA uses the term, we define a ''utility hot spot'' as ''a waterbody that is a source of consumable fish with Methylmercury tissue concentrations, attributable solely to utilities, greater than the EPA's Methylmercury water quality criterion of 0.3 mg/kg.'' We believe that the water quality criterion is an appropriate indicator of a ''hot spot,'' given that the Methylmercury exposure pathway of greatest concern is fish consumption and that the water quality criterion was back calculated from the Methylmercury RfD using a high-end fish consumption rate.

2. EPA Does Not Believe That There Will Be Any Hot Spots After Implementation of CAIR and CAMR

As explained elsewhere in this preamble and in the TSD, for purposes of today's notice, EPA modeled utility Hg deposition, before and after implementation of CAIR and CAMR, using the Community Multi-Scale Air Quality (''CMAQ'') model, a three-dimensional eulerian grid model. CMAQ is the most sophisticated Hg dispersion model in existence. It uses a ''one-atmosphere'' approach and addresses the complex physical and chemical interactions known to occur among multiple pollutants in the free atmosphere.[57] The spatial resolution (*i.e.*, the ability to observe concentration or depositional gradients/differences) of the gridded output information from CMAQ for purposes of this analysis is 36 km.

We believe that this an appropriate scale given the exposure pathway. First, because much of the Hg deposited on the watershed of different ecosystems will eventually enter waterbodies through subsurface inflow and runoff, we consider a watershed scale analysis to be more appropriate than finer scale resolution that may only describe direct inputs to surface waters. Second, in larger waterbodies (*i.e.*, the Great Lakes) where there is substantial fishing activity, the higher trophic level fish species consumed by humans are likely migratory and the accumulation of Hg by these species will represent an aggregated signal from deposition over a wider area (*e.g.*, the entire waterbody within a watershed.) Since we are concerned about the cumulative dose over weeks and months from repetitive consumption of fish containing methylmercury, this fishing behavior should be considered in the exposure pathway. Based on the above considerations, we conclude that the HUC–8 watershed is the appropriate unit of measure for analysis. While this analysis covers the vast majority of the U.S. population that may be exposed to emissions from U.S. power plants, we acknowledge that there are inherent uncertainties at the extreme tails of the exposure distribution. We continue to advance the state of the science and the associated models to better understand the tail of this exposure distribution.

As discussed in section VII.D. of today's notice, EPA used fish tissue data from the National Listing of Fish and Wildlife Advisories and the National Fish Tissue Survey to determine Methylmercury fish tissue concentrations for numerous sample sites throughout the country. We then used CMAQ to determine the amount of utility Hg deposition, in conjunction with Mercury Maps (which associates an increment of change in Hg deposition with an equal change in Methylmercury fish tissue concentrations) to predict what fish concentrations at those sample sites would be after implementation of CAIR and CAMR. As discussed in section VII.E., those analyses conclude that none of the sample sites will exceed, as a result of utility emissions, the water quality criterion of 0.3 mg/kg. In fact, our analysis shows that fish tissue Methylmercury concentrations attributable to utility Hg emissions will be significantly below the water quality criterion. By 2020, after CAIR, levels at the 50th, 90th, 99th percentiles and maximum value sample site are predicted to be 0.01, 0.03, 0.10, and 0.25 mg/kg, respectively. After CAMR, levels at the 50th, 90th, 99th percentiles and maximum value sample site are predicted to be 0.01, 0.03, 0.09, and 0.19 mg/kg, respectively. Therefore, based on the information available to us at this time, our analyses indicate utility Hg emissions, after implementation of either CAIR or CAMR, will not result in ''hot spots.''

EPA conducted a similar analysis in its 1998 Utility Report to Congress (''Utility Study'') using the Industrial Source Complex Version 3 (''ISC3'') model. (See TSD) EPA analyzed four model plants representing four utility boilers: Large coal-fired, medium coal-fired, small coal-fired, and medium oil-fired. Each of these plants was also modeled at two generic sites: A humid site east of the 90 degrees west longitude, and a more arid site west of the 90 degree west longitude. (See Utility Study at 7–29). Hg deposition was modeled at a hypothetical lake located at three distances for each model site: 2.5, 10, and 25 km. The results of that analysis showed that under only one modeled scenario was the Methylmercury water quality criterion exceeded. Specifically, the model predicted that a hypothetical lake located 2.5 km from a large eastern coal-fired utility would experience Methylmercury fish tissue concentration of 0.43 mg/kg. None of the other 23 model facilities/lake combinations exceeded the water criterion. (See Utility Study at 7–37).

For a number of reasons more fully explained in our TSD, even though only one facility/lake combination exceeded the water quality criterion, we believe that the analysis done for the 1998 Utility Study was conservative and, hence, over predicted near-field Hg deposition and corresponding fish tissue concentrations in almost all situations. That analysis was a screening analysis and thus was conservative by design. For example, it did not incorporate a sophisticated treatment of the atmospheric chemistry and phase-transition behavior of Hg, as we have included in our CMAQ analysis, and our understanding of wet and dry deposition processes for Hg has improved significantly since then. As a result, we judge that the CMAQ model results represent a more accurate representation of near-field Hg impacts than can be obtained using the ISC3 modeling approach. See the discussion above about why the CMAQ model appropriately represents near-field deposition.

There are other factors that lead EPA to conclude that the Utility Study analysis overstated fish-tissue methylmercury concentrations in most situations. Based on the BAFs considered, the hypothetical ecosystem described in the RTC is more sensitive

[57] In simulating the transport, transformation, and deposition of pollutants, CMAQ resolves 14 vertical layers in the atmosphere, and employs finer-scale resolution near the surface of the boundary layer to simulate deposition to both terrestrial and aquatic ecosystems. CMAQ atmospheric transport is defined using a higher-order meteorological model, commonly the Fifth-Generation Pennsylvania State University/National Center for Atmospheric Research mesoscale model (MM5).

than three out of four ecosystems chosen for the case studies (see Table 4–6, page 25 of Ecosystem Scale Modeling for Mercury Benefits Analysis) and is less sensitive than one (Lake Barco). Comparing these case studies to empirically derived BAFs characterized by the Office of Water indicates that modeled fish tissue responses in three of four case studies had empirically derived BAFs that fell between the 5th and 50th percentiles of the geometric mean of field-measured BAFs for trophic level 4 species obtained from the published literature (EPA 2000). The model ecosystem described in the RTC fell between the 50th and 95th percentile for BAFs, and one of the case studies (Lake Barco) exceeded the 95th percentile.

Some limitations to the BAF approach deserve mention. Because Methylmercury concentrations in the water column are highly variable, empirically-derived BAFs are inherently underdetermined and have limited predictive power. A more credible approach based on our current knowledge is to forecast changes in fish Hg concentrations using information on the food-web dynamics (''bioenergetics'') of different ecosystems. Such a model (BASS) was applied in one of the case studies described in Chapter 3 of the RIA for CAMR, and showed that while the BAFs calculated from the outputs of the bioenergetics-based bioaccumulation model were within a factor of 2 of the empirically derived BAF used in the SERAFM model, the empirically derived fish Hg concentrations were more conservative than the BASS model for this one ecosystem. (See TSD). Thus, the above information suggests that our RTC analysis may have over predicted fish-tissue methylmercury concentrations in many ecosystems that could be impacted by Hg deposition from U.S. power plants. However, it is important to note that fish tissue methylmercury concentrations due to power plants may be higher in some ecosystems (for example, ecosystems similar to Lake Barco described in Ch. 3 of the CAMR RIA).

For all the above described reasons, we think our current modeling approach as described in the TSD provides for a more advanced, state-of-the-science assessment of the atmospheric fate, transport, deposition, and cycling of Hg through the environment than the modeling approach used in the Utility Study. For these reasons, we have no evidence that utility Hg emissions after CAIR (and even more so after CAMR) will result in hot spots.

Based on our experience with the Title IV acid rain program and our modeling using IPM, we believe that the cap-and-trade approaches adopted under CAIR and CAMR will reduce Hg exposure in most areas and create strong economic incentives for the reduction of Hg emissions in the future.

First, modeling runs suggest that large coal-fired utilities contribute more to local Hg deposition than medium-sized and smaller coal-fired utilities.[58] However, under a cap-and-trade system, large utilities are more likely to over-control their emissions and sell resulting emission allowances than smaller utilities, which are less likely to be the source of a local hot spot. Under basic utility economics of capital investment, when capital is limited, up-front capital costs of control equipment are significant, and where emission-removal effectiveness (measured in percentage of removal) is unrelated to plant size, it makes more economic sense for a company to allocate pollution-prevention capital to its larger facilities where more allowances can be earned, than to its smaller ones. In other words, we would expect economies of scale of pollution control investment to be made at larger plants. Moreover, newer plants tend to be larger. Since newer plants have longer expected lifetimes, providing a longer return on investment, we would expect this to be an incentive for these larger facilities to choose to control and sell credits.

Indeed, as part of its analysis of the President's 2003 Clear Skies initiative, EPA analyzed Hg emissions reductions under a cap-and-trade mechanism. In the Clear Skies example, the greatest emissions reductions were projected to occur at the electric generating sources with the highest Hg emissions. This pattern is similar to that observed in the SO_2 emissions trading program under the Acid Rain Program. Under Clear Skies, compared to a base case of existing programs, Hg^{2+} emissions (which tend to be deposited locally, *i.e.*, within 25 kilometers) from power plants located up to 10 kilometers from a water body were projected to decrease by over 60 percent by 2020.

Second, the types of Hg that are deposited locally—Hg^{2+} and Hg_p—are controlled by the same equipment that controls PM, SO_2, and NO_X. Thus, as utilities invest in equipment to comply with EPA's new PM and ozone standards (*e.g.*, the CAIR rule that was signed on March 10, 2005 and new State Implementation Plans (SIPs) for PM and ozone), the Agency expects ''co-benefit'' Hg reductions.

Moreover, EPA's IPM modeling for today's action predicts that larger emitters generally are expected to reduce the most, as was our experience with the Acid Rain Program. Through our CMAQ modeling, we further predict utility-attributable deposition reductions in areas where hotspots would otherwise potentially occur. As described in section VII.E., the median deposition level is reduced by only 8 percent when utilities emissions are zeroed out in 2001, but in areas with the highest deposition levels, zeroing out utilities reduces the 99th percentile deposition level by 15 percent. After implementation of CAIR in 2020, areas with high levels of utility deposition receive a larger reduction in utility-attributable Hg deposition relative to areas with a relatively small level of utility-attributable deposition.

For all these reasons, we do not anticipate that our final CAMR rule will result in local Hg hot spots; to the contrary, we anticipate that our cap-and-trade CAMR will actually eliminate hot spots that may have previously existed.

In addition to reductions required by the CAIR and CAMR caps, states have the authority to address local health-based concerns separate from these programs. Although more stringent state regulations would reduce the flexibility of a cap-and-trade system, states nevertheless have such authority.

3. Continued Evaluation of Utility Hg Emissions

For all the reasons discussed above and elsewhere in this preamble, EPA does not believe that CAIR or CAMR will result in utility-attributable hot spots. That said, we recognize that even our state-of-the-art models and inputs have certain limitations that make it impossible for us to definitively conclude that there are no circumstances under which a hot spot could result even after full implementation of CAIR and CAMR. However, in order for a hot spot to occur, there would have to be an alignment of key environmental factors, such as meteorology, deposition, and ecosystem processes in conjunction with a large uncontrolled near-field utility unit or a collection of such units. The likelihood of these factors converging is remote. Nevertheless, we intend to monitor this situation closely and continue to advance the state of the science of Hg transport and fate. In that

[58] Indeed, the one model utility in the Utility Study analysis that exceeded the water quality criterion at a hypothetical lake within 2.5 km was an eastern large coal-fired utility. Given the tendencies for larger facilities to control under a cap-and-trade system, we do not anticipate that larger plants will cause localized hot spots.

regard, if we receive new information that raises the possibility of utility-attributable hotspots, we will evaluate the situation and take appropriate action.

We believe that we have the authority under the Act to address future hotspots appropriately. Indeed, today we have identified other authorities under the CAA through which we can obtain Hg reductions from coal-fired Utility Units—either by regulating Hg directly, or indirectly as the result of co-benefits. The 1998 Utility Study also identifies other requirements of the Act with which Utility Units must comply that can result in HAP reductions, including Hg. Because we do not currently have any facts before us that would lead us to conclude that utility-attributable hotspots exist, we do not at this time reach any conclusion as to which statutory authority we would use to address such a fact-specific situation because it necessarily depends on the facts.

For example, if in the future we determine that utility-attributable hotspots exist and that those hotspots occur as the result of Hg emissions from coal-fired Utility Units, we may promulgate a tighter section 111 standard of performance, provided we determine the technology can achieve the contemplated reductions. We could revise the standard of performance by adjusting the cap-and-trade program to limit trading by high-emitting Utility Units. As the DC Circuit has recognized, we have discretion to weigh the statutory factors identified in section 111(a), which include cost, in setting a standard of performance. *Lignite Energy Council* v. *EPA*, 198 F.3d 930 (DC Cir. 1999). We therefore believe that under section 111, we can evaluate the cost of emission reduction in the context of the identified hotspots, and we may reasonably conclude that the additional cost of a more stringent standard is appropriate in light of the health concern associated with the hotspots. Alternatively, we may in the future identify utility-attributable hotspots and determine that such hotspots can be addressed by virtue of Hg co-benefits control achieved through the promulgation of other requirements. Thus, although we cannot conclude today which statutory authority we would implement to address utility-attributable hotspots because that determination necessarily hinges on the facts associated with the identified hotspots, we do conclude that were such a situation to occur, we believe that EPA has adequate authority to address any such situation that may arise in the future.

J. The Global Pool of Hg Emissions

1. Background

As explained above, Hg is emitted into the environment in different ways. About one-third of the Hg in the atmosphere is from human-caused activities (''anthropogenic''), one-third is from natural processes (such as volcanic eruption, groundwater seepage and evaporation from the oceans), and one-third constitutes re-emitted emissions, which is Hg from human-caused activities or natural processes that is emitted into the atmosphere, deposited and then re-emitted into the atmosphere. United States anthropogenic Hg emissions are estimated to account for about three percent of the global pool of Hg emissions, and United States (''domestic'') utilities are estimated to account for about one percent of that total global pool. See Utility Study at 7–1 to 7–2, 69 FR at 4657–58 (January 20, 2004). The global pool therefore includes all human-caused activities that occur both within the United States and abroad, all emissions that result from natural processes anywhere in the world, and re-emitted Hg.

To place the Hg emissions from domestic Utility Units in context, EPA modeled different scenarios that analyze the effect of domestic utility Hg emissions in the context of the global pool. We describe that modeling in detail above.

Our modeling shows that in virtually all instances, the utility-attributable methylmercury levels are a very small fraction of the overall methylmercury levels. For 16 percent of the modeled sites, overall levels of methylmercury in fish tissue in 2020 are projected to be above the 0.3 mg/kg water quality criterion. At the 90th percentile, in 2020, after implementation of CAIR, overall levels are projected at 0.79 mg/kg, and at the 99th percentile, at 1.64. The greatest fraction of these methylmercury levels are attributable to non-air sources, including mines and chloralkali plants, and uncontrollable air sources, including international emissions from industrial and utility sources. In virtually all of these instances, the Utility-attributable methylmercury levels are a very small fraction of the overall methylmercury levels. For the highest 10 percent of utility-attributable methylmercury fish tissue levels, utility-attributable methylmercury accounted for a maximum of 9 percent of total methylmercury concentrations, and an average of only 4 percent. Clearly, even at locations with high levels of utility Hg deposition, other sources of Hg contribute most of the methylmercury.

2. Even Examining Utility Hg Emissions in the Context of the Global Pool, We Cannot Conclude That It Is Appropriate to Regulate Coal-Fired Utility Units Under CAA Section 112

Our conclusions in sections VI.J and VI.K above are based solely on our analysis of Hg emissions from coal-fired Utility Units. See generally 65 FR 79,826–29 (explaining that Hg from coal-fired units is the HAP of greatest concern); Utility Study, ES–27 (same). We focused our analysis in this regard because EPA has interpreted section 112(n)(1)(A) to examine the hazards to public health that are ''a result of'' Utility Units. See CAA section 112(n)(1)(A). As explained in section III above, the focus in section 112(n)(1)(A) on emissions ''result[ing]'' from Utility Units is significant, particularly when contrasted against other provisions of the Act, such as section 110(a)(2)(D). In section 110(a)(2)(D), Congress sought to regulate any air pollutant that will ''contribute to'' nonattainment. Thus, under section 110(a)(2)(D), we can regulate a pollutant if it ''contributes'' to a nonattainment problem, but does not itself cause the problem. EPA has concluded that section 112(n)(1)(A) is different, where Congress directed EPA to study the hazards to public health ''reasonably anticipated *to occur as a result of emissions of*'' Utility Units. (emphasis added)

Moreover, Congress' focus on the hazards to public health resulting from Utility Units may reflect Congress' recognition of the unique situation posed by Hg, which is that Hg emissions from domestic utilities represent less than one percent of the global pool. Indeed, Congress specifically addressed Hg in other provisions of section 112(n). For example, under section 112(n)(1)(B), Congress required EPA to complete a study addressing Hg emissions from Utility Units and other sources of Hg. See CAA section 112(n)(1)(B); see also CAA Section 112(n)(1)(C) (requiring National Institute of Environmental Health Sciences to determine the threshold level of Hg exposure below which adverse human health effects are not expected to occur).

Nevertheless, even were we to examine hazards to public health on a broader scale by focusing on the global Hg pool, our conclusion (discussed above in Section IV.A.) that it is not appropriate to regulate coal-fired Utility Units under section 112 on the basis of Hg emissions would be the same. Our analyses in support of that conclusion would differ, however, because we

would be assessing whether it is appropriate to regulate Utility Units under section 112 by reference to a different level of Hg emissions. As explained in section III of this notice, we have discretion, in determining whether regulation under section 112 is appropriate, to consider other factors and, in particular, any unique facts and circumstances associated with the HAP emissions at issue. Here, the unique circumstance is that domestic Utility Units represent only one percent of the global pool. Our modeling shows that were we to prohibit all Hg emissions from domestic utilities in this country, such regulation would result in only a very small improvement in methylmercury levels in the waterbodies that exceed the methylmercury water quality criteria. Therefore, precluding all Hg emissions from coal-fired powerplants would, in effect, force such plants out of business, yet reduce virtually none of the risks to public health stemming from the global Hg pool.

In these circumstances, we find that it is not appropriate to regulate coal-fired Utility Units under section 112 on the basis of the global Hg pool because the health benefits associated with such regulation would be nominal and the costs extreme. It is also not appropriate to regulate Hg emissions from coal-fired utility units remaining after imposition of the requirements of the Act because the global sources contributing most significantly to the remaining public health hazards are not domestic utilities and the sole question before us under section 112(n)(1)(A) is whether it is appropriate to regulate Utility Units under section 112 of the Act.[59]

K. Further Study

The behavior of Hg in the atmosphere and in aquatic systems, and the human health effects of Hg are areas of much interest and activity within the scientific and health research communities. In addition, our ability to quantify and value the effects that changes in Hg releases may have to human health is continuing to evolve. Furthermore, technologies and techniques for limiting Hg emissions from power plants are also rapidly advancing. EPA will continue to monitor developments in all these areas, as well as continuing its own efforts to advance the state of the science. One of the benefits of today's approach is that it provides a flexible structure that could be modified to accommodate new information should it become available.

VII. EPA'S Authority to Regulate HAP From Utility Units Under CAA Section 111

As explained in sections IV and VI above, we conclude today, among other things, that EPA's December 2000 appropriate and necessary finding lacked foundation because it failed to consider the HAP reductions that could be obtained through implementation of section 111, and therefore whether it was ''necessary'' to regulate under section 112. We decide today that it is not ''necessary'' to regulate utility HAPs under section 112, in particular because of our authorities to effectively reduce utility HAPs under CAA sections 110(a)(2)(D) and 111.[60]

We describe below the regulatory scheme under section 111 and EPA's authority to regulate HAP emissions under that section. We also describe the recently issued Clean Air Mercury Rule (''CAMR''), which implements CAA section 111. Finally, we demonstrate that the CAMR rule, once implemented, will result in levels of Hg emissions from coal-fired Utility Units that pose no hazards to public health.

A. Overview of the Requirements of Section 111

CAA section 111 creates a program for the establishment of ''standards of performance.'' A ''standard of performance'' is ''a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction, which (taking into account the cost of achieving such reduction, any nonair quality health and environmental impacts and energy requirements), the Administrator determines has been adequately demonstrated.'' CAA section 111(a)(1).

For new sources, EPA must first establish a list of stationary source categories, which, the Administrator has determined ''causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare.'' CAA section 111(b)(1)(A)). EPA must then set federal standards of performance for new sources within each listed source category. (CAA section 111(b)(1)(B)). Like section 112(d) standards, the standards for new sources under section 111(b) apply nationally and are effective upon promulgation. (CAA section 111(b)(1)(B)).

Existing sources are addressed under section 111(d) of the CAA. EPA can issue standards of performance for existing sources in a source category only if it has established standards of performance for new sources in that same category under section 111(b), and only for certain pollutants. (CAA section 111(d)(1)). Section 111(d) authorizes EPA to promulgate standards of performance that states must adopt through a SIP-like process, which requires state rulemaking action followed by review and approval of state plans by EPA. If a state fails to submit a satisfactory plan, EPA has the authority to prescribe a plan for the state. (CAA section 111(d)(2)(A)).

B. EPA's Authority to Regulate HAP Under Section 111

Section 111(b) covers any category of sources that causes or contributes to air pollution that may reasonably be anticipated to endanger public health or welfare and provides EPA authority to regulate new sources of such air pollution. EPA included Utility Units on the section 111(b) list of stationary sources in 1979 and has issued final standards of performance for new Utility Units for pollutants, such as NO_X, PM, and SO_2. See 44 FR 33580; June 11, 1979; Subpart Da of 40 CFR Part 60. Nothing in the language of section 111(b) precludes EPA from issuing additional standards of performance for other pollutants, including HAP, emitted from new Utility Units. Moreover, nothing in section 112(n)(1)(A) suggests that Congress sought to preclude EPA from regulating Utility Units under section 111(b). Indeed, section 112(n)(1)(A)

[59] *See* 36 Cong. Rec. S16895, S16899 (daily ed. Oct. 27, 1990) (Statement of Senator Burdick, member of the Conference Committee and Chairman of the Committee on Environment and Public Works) (''Under section 112(n) utility emissions are exempt from air toxics regulation until studies are completed and the Administrator determines, based on the studies, that air toxics regulation is warranted. The hazardous substance of greatest concern here is Hg. The Senate bill required Hg reductions from coal-fired units. The Senate provision could not be sustained by the scientific facts. What little is known of Hg movement in the biosphere, suggests that its long residence time makes it a long-range transport problem of international or worldwide dimensions. Thus, a full control program in the United States requiring dry scrubbers and baghouses to control Hg emissions from coal-fired power plants would double the costs of acid rain control with no expectation of perceptible improvement in public health in the United States. I am pleased the conferees adopted the House provision on hazardous air pollutants with respect to Utility Units.'')

[60] We also conclude today, as discussed in detail above, that Hg emissions from coal-fired Utility Units remaining after implementation of section 110(a)(2)(D) do not result in hazards to public health. See Sections V and VI. Section 111, which is the focus of this section of the preamble, constitutes an independent basis for our actions today, because that provision, once implemented, will effectively address any Hg emissions from coal-fired Utility Units, and for that reason, Hg emissions from coal-fired Utility Units that remain ''after imposition of the requirements of th[e] Act do not result in hazards to public health.'' CAA Section 112(n)(1)(A).

provides to the contrary, in that it calls for an analysis of utility HAP emissions ''after imposition of the requirements of th[e] Act,'' which we have reasonably interpreted to mean those authorities that EPA reasonably anticipated at the time of the Study would have reduced utility HAP emissions.

EPA received numerous comments concerning its authority under section 111 to regulate HAP from Utility Units. Those comments focused largely on EPA's authority to regulate existing units under section 111(d). As explained below, EPA has reasonably interpreted section 111(d) as providing authority to regulate HAP from existing Utility Units.

Unlike section 111(b), section 111(d) specifically references CAA section 112. The import of that reference is not clear on the face of Public Law 101–549, which is the 1990 amendments to the CAA, because the House and Senate each enacted a different amendment to section 111(d). The Conference Committee never resolved the differences between the two amendments and both were enacted into law as part of section 111(d). EPA is therefore confronted with the highly unusual situation of an enacted bill signed by the President that contains two different and inconsistent amendments to the same statutory provision.

1. Overview of the Two Amendments in Section 111(d)

An important starting point for evaluating the two amendments to section 111(d) in 1990 is the 1977 Act. Section 111(d) of the 1977 CAA provides, in pertinent part:

> The Administrator shall prescribe regulations which shall establish a procedure similar to that provided by section 7410 of this title under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 7408(a) or 7412(b)(1)(A) of this title, but (ii) to which a standard of performance under this section would apply if such existing source were a new source. * * *

42 U.S.C.A. 7411(d) (West 1977); Public Law 95–95. The above language provides that standards of performance under section 111(d) cannot be established for any pollutant that is listed as a ''hazardous air pollutant'' under section 112(b)(1)(A) of the 1977 CAA.

In 1990, Congress significantly amended the CAA. Among other things, it significantly amended section 112, it enacted Title IV of the CAA, which includes numerous provisions that are directly applicable to Utility Units, and it amended section 111(d). Both the House and the Senate bills included different amendments to section 111(d), and both of those amendments were enacted into law.

The first amendment, which is the House amendment, is contained in section 108(g) of Public Law 101–549. That section amends section 111(d)(1)(A)(i) of the 1977 CAA by striking the words ''or 112(b)(1)(A)'' from the 1977 CAA and inserting in its place the following phrase: ''or emitted from a source category which is regulated under section 112.'' The second amendment to section 111(d), which is the Senate amendment, is labeled a ''conforming amendment'' and is set forth in section 302 of Public Law 101–549. That section amends CAA section 111(d)(1) of the 1977 CAA by striking the reference to ''112(b)(1)(A)'' and inserting in its place ''112(b).'' The two amendments are reflected in parentheses in the Statutes at Large as follows:

> The Administrator shall prescribe regulations which shall establish a procedure similar to that provided by section 7410 of this title under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 7408(a) *(or emitted from a source category which is regulated under section 112)* [House amendment,] *(or 112(b))* [Senate Amendment,] but (ii) to which a standard of performance under this section would apply if such existing source were a new source. * * *

The United States Code does not contain the parenthetical reference to the Senate amendment, as set forth in section 302 of Public Law 101–549. The codifier's notes to this section of the Official Committee Print of the executed law state that the Senate amendment ''could not be executed'' because of the other amendment to section 111(d) contained in the same Act. The United States Code does not control here, however. The Statutes at Large constitute the legal evidence of the laws, where, as here, Title 42 of the United States Code, which contains the CAA, has not been enacted into positive law. *See* 1 U.S.C. 204(a); *United States* v. *Welden,* 377 U.S. 95, 98 n.4 (1964); *Washington-Dulles Transportation Ltd.* v. *Metropolitan Washington Airports Auth.,* 263 F.3d 371, 378 (4th Cir. 2001). We did not receive any comments disputing either that the Statutes of Large constitute the legal evidence of the laws in this case, or that the 1990 Act contains two different amendments to the same statutory provision.[61]

2. Overview of Legislative History

As we indicated in the proposal, there is scant legislative history concerning the two amendments to section 111(d). The most persuasive legislative history that is relevant to our task of interpreting and reconciling the House and Senate amendments to section 111(d) is the final Senate and House bills. Those bills reflect significantly different treatment of Utility Units under section 112, as well as different amendments to section 111(d).

We begin our analysis with Senate bill 1630, as passed by the Senate on April 3, 1990. That bill included a provision concerning Utility Units. See generally Section 301 (hazardous air pollutants), A Legislative History of the Clean Air Act Amendments of 1990 (''Legislative History''), Vol III, at 4431–33 (Nov. 1993). Under that provision, EPA was to conduct a study on the health and environmental effects of utility HAP emissions within three years of enactment of the statute. The Senate Bill also required EPA to promulgate section 112(d) emissions standards for Utility Units within five years of enactment of the statute. The Senate bill further required EPA to place the study on utility HAP emissions in the docket for the section 112(d) rulemaking for Utility Units. Finally, the Senate bill, in a section labeled ''conforming amendments,'' amended section 111(d) by striking the reference to ''112(b)(1)(A)'' in the 1977 Act and replacing it with ''112(b).'' *See generally* Section 305 (conforming amendments), Legislative History, Vol III, at 4534.

The final bill that passed the House in May 1990 stands in stark contrast to the Senate Bill. The House Bill included section 112(l), entitled ''Electric Utilities.'' *See generally* Section 301 (hazardous air pollutants), Legislative History, Vol II, at 2148–49. That provision is identical to section 112(n)(1)(A). See 104 Stat. 2558. The House bill also amended section 111(d) by replacing the words ''or 112(b)(1)(A)'' with ''or emitted from a source category which is regulated under section 112.'' See Legislative History, Vol. II, at 179.

Finally, the House provision concerning Utility Units is the provision that was enacted into law as section 112(n)(1)(A). The Senate approach to

[61] Although the notes accompanying the Official Committee Print do not interpret with the force of law, their conclusion about the appropriate effect to give these conflicting amendments is evidence that EPA's conclusion is reasonable.

regulating Utility Units under section 112 did not prevail. *See* Legislative History, Vol. I at 1451.

3. EPA's Interpretation of the Two Amendments to Section 111(d)

Neither we, nor commenters, have identified a canon of statutory construction that addresses the specific situation with which we are now faced, which is how to interpret two different amendments to the exact same statutory provision in a final bill that has been signed by the President. The canon of statutory construction that calls for harmonizing conflicting statutory provisions, where possible, and adopting a reading that gives some effect to both provisions is not controlling here because that canon applies where two provisions of a statute are in conflict, not where two amendments to the same statutory provision are in conflict. Nevertheless, we have attempted to follow the general principles underlying this canon of construction. We also rely on the legislative history noted above as support for our interpretation of the two amendments to section 111(d).

Turning first to the House amendment, we noted at proposal that a literal reading of that amendment is that a standard of performance under section 111(d) cannot be established for any air pollutant—HAP and non-HAP—emitted from a source category regulated under section 112. See 69 FR 4685. Certain commenters disagreed with our reading. They argue instead that a literal reading of the House amendment is that EPA cannot regulate under section 111(d) any HAP that is emitted from any source category regulated under section 112. This reading modifies the plain language of section 111(d), as amended by the House in 1990, in significant respects. First, it changes the terms ''any pollutant'' to ''HAP,'' and second, it changes the phrase ''a source category,'' to ''any source category'' and therefore commenters'' reading of the amendment cannot be characterized as a ''literal' reading.

Section 111(d), as amended by the House, specifically provides:

> Each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source *for any air pollutant * * * which is not emitted from a source category which is regulated under section 112.*

We interpret this language to mean that EPA cannot establish a standard of performance under CAA section 111(d) for any ''air pollutant''—including both HAP and non-HAP—that is emitted from a particular source category regulated under section 112. Thus, under our interpretation, if source category X is ''a source category'' regulated under section 112, EPA could not regulate HAP or non-HAP from that source category under section 111(d). This interpretation reflects the distinction drawn in section 111(d), as amended by the House, between ''any pollutant'' and ''a source category.'' The phrase ''any pollutant'' existed prior to the 1990 amendments and therefore it can be reasonably assumed that when the House amended section 111(d) in 1990, it intentionally chose the words ''a source category,'' as opposed to ''any source category. Although we recognize that the phrase ''a source category'' is susceptible to different interpretations, in that it could conceivably mean one or many source categories, we believe that our interpretation is a permissible construction given the juxtaposition of the phrases ''any pollutant'' and ''a source category'' in section 111(d), as amended by the House.

Moreover, consistent with our interpretation of the House amendment, we believe that the House sought to change the focus of section 111(d) by seeking to preclude regulation of those pollutants that are emitted from a particular source category that is actually regulated under section 112. The legislative history described above is instructive in this regard. At the same time the House substantively amended section 111(d), it passed a bill containing a provision (section 112(l)) that is identical to section 112(n)(1)(A) of the current act. Section 112(l) of the House bill calls for EPA to examine how the ''imposition of the requirements of th[e] Act'' would affect utility HAP emissions. This provision suggests that the House did not want to subject Utility Units to duplicative or overlapping regulation. In this regard, the House's amendment to section 111(d) could reasonably reflect its effort to expand EPA's authority under section 111(d) for regulating pollutants emitted from particular source categories that are not being regulated under section 112. Such a reading of the House language would authorize EPA to regulate under section 111(d) existing area sources which EPA determined did not meet the statutory criterion set forth in section 112(c)(3), as well as existing Utility Units (in the event EPA did not decide to regulate such units under section 112).

The Senate amendment provides that a section 111(d) standard of performance cannot be established for any HAP that is listed in section 112(b)(1), regardless of whether the source categories that emit such HAP are actually regulated under section 112. The Senate amendment reflects the Senate's intent to retain the pre-1990 approach of precluding regulation under CAA section 111(d) of any HAP listed under section 112(b). The Senate's intent in this regard is confirmed by the fact that its amendment is labeled a ''conforming amendment,'' which is generally a non-substantive amendment. By contrast, the House amendment is not a conforming amendment.[62]

Moreover, the Senate's conforming amendment is consistent with the Senate's treatment of Utility Units in the final Senate Bill. Unlike the House bill, the Senate bill did not call for an examination of the other requirements of the CAA. Nor did it provide EPA discretion to determine whether Utility Units should be regulated under section 112. Instead, the Senate bill included a provision that would have required EPA to establish section 112(d) emission standards for Utility Units by a date certain. This provision, which was never enacted into law, is consistent with the Senate's conforming amendment which provides that HAP listed under section 112(b) cannot be regulated under section 111(d).

Based on the legislative history described above, we believe that the House amendment, as we have interpreted it, is wholly consistent with section 112(l) of the House bill, which the conference committee adopted as the provision governing Utility Units (section 112(n)(1)(A). It is hard to conceive that Congress would have adopted section 112(n)(1)(A), yet retained the Senate amendment to section 111(d). While it appears that the Senate amendment to section 111(d) is a drafting error and therefore should not be considered, we must attempt to give effect to both the House and Senate amendments, as they are both part of the current law.

The House and Senate amendments conflict in that they provide different standards as to the scope of EPA's authority to regulate under section 111(d). As we explained at proposal, in an effort to give some effect to both amendments, we reasonably interpret the amendments as follows: Where a source category is being regulated under section 112, a section 111(d) standard of performance cannot be established to address any HAP listed under section 112(b) that may be emitted from that particular source category. Thus, if EPA is regulating source category X under section 112, section 111(d) could not be

[62] There is a section of the final House bill that includes conforming amendments. The House amendment to section 111(d) does not appear in that sectiono of the bill, however. *See* Legislative History, Vol. II, at 179, 1986.

used to regulate any HAP emissions from that particular source category. This is a reasonable interpretation of the amendments to section 111(d) because it gives some effect to both amendments. First, it gives effect to the Senate's desire to focus on HAP listed under section 112(b), rather than applying the section 111(d) exclusion to non-HAP emitted from a source category regulated under section 112, which a literal reading of the House amendment would do. Second, it gives effect to the House's desire to increase the scope of EPA's authority under section 111(d) and to avoid duplicative regulation of HAP for a particular source category. *See* 136 Cong. Rec. H12911, 12934 (daily ed. Oct. 26, 1990) (the conferees adopted section 112(n)(1)(A) ''because of the logic of basing any decision to regulate on the results of scientific study and because of the emission reductions that will be achieved and the extremely high costs that electric utilities will face under other provisions of the new Clean Air Act amendments.'').

We recognize that our proposed reconciliation of the two conflicting amendments does not give full effect to the House's language, because a literal reading of the House language would mean that EPA could not regulate HAP or non-HAP emitted from a source category regulated under section 112. Such a reading would be inconsistent with the general thrust of the 1990 amendments, which, on balance, reflects Congress' desire to require EPA to regulate more substances, not to eliminate EPA's ability to regulate large categories of pollutants like non-HAP. Furthermore, EPA has historically regulated non-HAP under section 111(d), even where those non-HAP were emitted from a source category actually regulated under section 112. *See, e.g.,* 40 CFR 62.1100 (California State Plan for Control of Fluoride Emissions from Existing Facilities at Phosphate Fertilizer Plants). We do not believe that Congress sought to eliminate regulation for a large category of sources in the 1990 Amendments and our proposed interpretation of the two amendments to section 111(d) avoids this result.[63]

Finally, in assessing whether to revise the December 2000 ''necessary'' finding, it is reasonable to look to whether CAA section 111 constituted a viable alternative authority for regulating utility HAP emissions prior to the December 2000 finding. The answer is yes and therefore under our proposed interpretation of the conflicting amendments, we could have regulated HAP from Utility Units under section 111(d). We listed coal- and oil-fired Utility Units under section 112(c) in December 2000 based solely on our appropriate and necessary finding. As explained above, that finding lacks foundation and recent information confirms that it is neither appropriate nor necessary to regulate Utility Units under CAA section 112. We should have recognized prior to the December 2000 finding that section 111 constituted a viable authority for regulating utility HAP emissions and therefore should have never listed Utility Units on the Section 112(c) list. In addition, as explained below, the December 2000 finding and associated listing is not a final agency action and EPA can therefore make revisions to that finding at any point prior to taking final action. Such revisions are particularly appropriate here, because the prior finding is incorrect and new information confirms this fact.

Some commenters argue that their reading of the House amendment and reconciliation of the amendments is reasonable, but the question is not whether commenters have identified a reasonable construction of section 112(d). Rather, the issue is whether our construction is a permissible one, and for the reasons set forth above, we believe that it is. *See Smiley* v. *Citibank,* N.A. 517 U.S. 735, 744–45 (1996) (a ''permissible'' interpretation is one that is ''reasonable''). Other commenters effectively ask us to ignore the House amendment because the Senate amendment reflects the law as of 1977. We cannot ignore the House amendment, as it is part of current law, and Congress substantially amended the law in 1990, by including, among other things, section 112(n)(1)(A).[64]

VIII. Removal of Coal- and Oil-Fired Utility Units From the Section 112(C) List

Section 112(n)(1)(A) sets forth the criteria for regulating Utility Units under section 112. The criteria are: Whether regulation of Utility Units under section 112 of the CAA is ''appropriate'' and ''necessary.'' In December 2000, EPA added coal- and oil-fired Utility Units to the section 112(c) list in light of its positive appropriate and necessary finding for such units. *See* 65 FR 79831.

In the January 2004 proposed rule, EPA proposed removing coal- and oil-fired Utility Units from the section 112(c) list based on our proposed reversal of the December 2000 finding. Today, we conclude that the December 2000 finding lacked foundation and that regulation of coal- and oil-fired Utility Units under section 112 is not appropriate and necessary. Based on those decisions and our revision of the December 2000 finding, we remove coal- and oil-fired Utility Units from the section 112(c) list. We disagree with those commenters that argue that EPA cannot remove coal and oil-fired Utility Units from the section 112(c) list without satisfying the delisting criteria in section 112(c)(9).

EPA reasonably interprets section 112(n)(1)(A) as providing it authority to remove coal- and oil-fired units from the section 112(c) list at any time that it makes a negative appropriate and necessary finding under the section. Congress set up an entirely different structure and predicate for assessing whether Utility Units should be listed for regulation under section 112. Compare 112(c)(1) and (c)(3), with 112(n)(1)(A). Section 112(n)(1)(A)

[63] The first instance in which the Agency proposed an interpretation of the conflicting House and Senate amendments to CAA section 111(d) was in the January 2004 proposed rule. We recognize that we may have made statements concerning section 111(d), since the 1990 Amendments, but those statements did not recognize or account for the two different amendments to section 111(d), as enacted in 1990. We are also amending 40 CFR 60.21, as part of the final CAMR. That regulation, which was promulgated in 1975, interprets the 1970 CAA and defines a ''designated pollutant'' for purposes of section 111(d), as excluding any pollutant that is listed on the section 112(b)(1)(A) list. There is no section 112(b)(1)(A) in the current act, as amended in 1990. We are therefore revising 40 CFR 60.21 because it does not reflect the current language of section 111(d), as amended in 1990.

[64] Finally, some commenters argue that EPA's interpretation of the conflicting amendments was unreasonable, because it would give EPA discretion to regulate area sources, under section 111, as opposed to section 112. These commenters fail to recognize the listing criteria for area sources under section 112(c)(3). That section, for example, provides that EPA shall list a category or subcategory of area sources under section 112 if it finds that the category or subcategory presents a threat of adverse effects to human health or the environment in a manner ''that warrants regulation under section 112.'' Thus, EPA must determine whether the category or subcategory presents a threat that warrants regulation under section 112. If EPA determined that the listing criteria for a category of area sources were not met, nothing would preclude EPA from regulating HAP from that category under section 111(d), which contains different requirements for regulation. See General Overview of section 111 above.

Another commenter argued that EPA's interpretation of the two amendments is contrary to a canon of statutory construction that provides that where a conflict exists between two provisions of an act, the last provision in point of arrangement controls. This commenter argues that because the Senate conforming amendment is found in section 302 of Public Law 101–549, and the House amendment in section 108(g), the Senate amendment should control. As explained above, this canon of statutory construction is not directly relevant to situations where the conflict at issue is between two different amendments to the same statutory provision. Furthermore, application of this canon of construction would be contrary to the legislative history described above.

therefore occupies the field in section 112 with regard to Utility Units. Section 112(n)(1)(A) provides EPA significant discretion in making the appropriate and necessary finding and nothing in section 112(n)(1)(A) suggests that EPA cannot revise its finding, where, as here, it has both identified errors in its prior finding and determined that the finding lacked foundation, and where EPA has received new information that confirms that it is not appropriate or necessary to regulate coal- and oil-fired Utility Units under section 112.[65]

The section 112(c)(9) criteria also do not apply in two situations that are directly relevant here. First, the December 2000 appropriate and necessary finding and associated listing are not final agency actions. *UARG* v. *EPA,* 2001 WL 936363, No. 01–1074 (DC Cir. July 26, 2001). EPA therefore has inherent authority under the CAA to revise those actions at any time based on either identified errors in the December 2000 finding or on new information that bears upon that finding. Second, as explained in the proposed rule, the section 112(c)(9) criteria do not apply where, as here, the source category at issue did not meet the statutory criteria for listing at the time of listing. See 68 FR 28197, 28200 June 4, 1996; see also 69 FR 4689 (citing additional examples where EPA has removed a source category from the section 112(c) list without following the criteria in section 112(c)(9) due to an error at the time of listing). For all of the reasons noted above, EPA did not meet the statutory listing criteria at the time of listing for coal- and oil-fired Utility Units. Accordingly, coal- and oil-fired Utility Units should never have been listed under section 112(c) and therefore the criteria of section 112(c)(9) do not apply to today's action.

IX. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

Under Executive Order 12866 (58 FR 51735, October 4, 1993), the Agency must determine whether a regulatory action is ''significant'' and therefore subject to Office of Management and Budget (OMB) review and the requirements of the Executive Order. The Order defines ''significant regulatory action'' as one that is likely to result in a rule that may:

1. Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or Tribal governments or communities;

2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, OMB has notified us that it considers this a ''significant regulatory action'' within the meaning of the Executive Order. We have submitted this action to OMB for review. However, EPA has determined that this rulemaking will not have a significant economic impact. Changes made in response to OMB suggestions or recommendations will be documented in the public record. All written comments from OMB to EPA and any written EPA response to any of those comments are included in the docket listed at the beginning of this notice under **ADDRESSES.**

B. Paperwork Reduction Act

This action does not contain any information collection requirements and therefore is not subject to the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*).

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (Pub. L. 104–121) (SBREFA), provides that whenever an agency is required to publish a general notice of rulemaking, it must prepare a regulatory flexibility analysis, unless it certifies that the rule, if promulgated, will not have ''a significant economic impact on a substantial number of small entities.'' 5 U.S.C. 605(b). Small entities include small businesses, small organizations, and small governmental jurisdictions.

As was discussed in the January 30, 2004 NPR, EPA determined that it was not necessary to prepare a regulatory flexibility analysis in conjunction with this rulemaking. We certify that this action will not have a significant impact on a substantial number of small entities because it imposes no regulatory requirements.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) (UMRA), establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and Tribal governments and the private sector. Under UMRA section 202, 2 U.S.C. 1532, EPA generally must prepare a written statement, including a cost-benefit analysis, for any proposed or final rule that ''includes any Federal mandate that may result in the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector, of $100,000,000 or more * * * in any one year.'' A ''Federal mandate'' is defined under section 421(6), 2 U.S.C. 658(6), to include a ''Federal intergovernmental mandate'' and a ''Federal private sector mandate.'' A ''Federal intergovernmental mandate,'' in turn, is defined to include a regulation that ''would impose an enforceable duty upon State, local, or Tribal governments,'' section 421(5)(A)(i), 2 U.S.C. 658(5)(A)(i), except for, among other things, a duty that is ''a condition of Federal assistance,'' section 421(5)(A)(i)(I). A ''Federal private sector mandate'' includes a regulation that ''would impose an enforceable duty upon the private sector,'' with certain exceptions, section 421(7)(A), 2 U.S.C. 658(7)(A).

We have determined that the final rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, or tribal governments, in the aggregate, or the private sector in any 1 year. Thus, today's final rule is not subject to the requirements of sections 202 and 205 of the UMRA. In addition, we have determined that the final rule contains no regulatory requirements that might significantly or uniquely affect small governments because it contains no regulatory requirements that apply to such governments or impose obligations upon them. Therefore, the final rule is not subject to the requirements of section 203 of UMRA.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the EO to include regulations that have

[65] Although not critical to our analysis, we do note that it is questionable whether we even had a legal obligation in December 2000 to list Utility Units under section 112(c) after making the positive appropriate and necessary finding. Section 112(n)(1)(A) makes no reference to CAA section 112(c) and the framework of section 112(c)(1) and (c)(3) does not expressly provide for the listing of Utility Units. Rather, those provisions speak to major and area sources, which Congress treated differently from Utility Units.

''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

This rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in EO 13132. The CAA establishes the relationship between the Federal government and the States, and this rule does not impact that relationship. Thus, EO 13132 does not apply to this rule. However, in the spirit of EO 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicited comment on this rule from State and local officials.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

EO 13175, entitled ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249, November 9, 2000), requires EPA to develop an accountable process to ensure ''meaningful and timely input by Tribal officials in the development of regulatory policies that have Tribal implications.''

This rule does not have Tribal implications as defined by EO 13175. It does not have a substantial direct effect on one or more Indian Tribes, in that it is a determination not to regulate utilities under section 112, and therefore imposes no burdens on tribes. Furthermore, this rule does not affect the relationship or distribution of power and responsibilities between the Federal government and Indian Tribes. The CAA and the Tribal Authority Rule (TAR) establish the relationship of the Federal government and Tribes in implementing the Clean Air Act. Because this rule does not have Tribal implications, EO 13175 does not apply.

Although EO 13175 does not apply to this rule, EPA took several steps to consult with Tribal officials in developing this rule. EPA gave a presentation to a national meeting of the Tribal Environmental Council (NTEC) in April 2001, and encouraged Tribal input at an early stage. EPA then worked with NTEC to find a Tribal representative to participate in the workgroup developing the rule, and included a representative from the Navajo Nation as a member the official workgroup, with a representative from the Campo Band later added as an alternate. In March 2004, EPA provided a briefing for Tribal representatives and the newly formed National Tribal Air Association and NTEC. EPA received comments on this rule from a number of tribes, and has taken those comments and other input from Tribal representatives into consideration in development of this rule.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

Executive Order 13045, ''Protection of Children from Environmental Health and Safety Risks'' (62 FR 19885, April 23, 1997) applies to any rule that (1) is determined to be ''economically significant'' as defined under EO 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, section 5–501 of the EO directs the Agency to evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

The final rule is not subject to Executive Order 13045 because it is not an economically significant regulatory action as defined by Executive Order 12866. In addition, EPA interprets Executive Order 13045 as applying only to those regulatory actions that are based on health and safety risks, such that the analysis required under section 5–501 of the Executive Order has the potential to influence the regulations. The final rule is not subject to Executive Order 13045 because it does not include regulatory requirements based on health or safety risks.

Nonetheless, in making its determination as to whether it is ''appropriate and necessary'' to regulate Utility Units under section 112, EPA considered the effects of utility HAP emissions on both the general population and sensitive subpopulations, including children.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

Executive Order 13211 (66 FR 28355, May 22, 2001) provides that agencies shall prepare and submit to the Administrator of the Office of Regulatory Affairs, OMB, a Statement of Energy Effects for certain actions identified as ''significant energy actions.'' Section 4(b) of EO 13211 defines ''significant energy actions'' as ''any action by an agency (normally published in the **Federal Register**) that promulgates or is expected to lead to the promulgation of a final rule or regulation, including notices of inquiry, advance notices of final rulemaking, and notices of final rulemaking: (1) (i) That is a significant regulatory action under EO 12866 or any successor order, and (ii) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (2) that is designated by the Administrator of the Office of Information and Regulatory Affairs as a ''significant energy action.'' Although this final rule is a significant regulatory action under EO 12866, it will not have a significant adverse effect on the supply, distribution, or use of energy.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act (NTTAA) of 1995 (Pub. L. 104–113; Section 12(d), 15 U.S.C. 272 note) directs EPA to use voluntary consensus standards (VCS) in their regulatory and procurement activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (*e.g.*, materials specifications, test methods, sampling procedures, business practices) developed or adopted by one or more voluntary consensus bodies. NTTAA directs EPA to provide Congress, through annual reports to OMB, with explanations when an agency does not use available and applicable VCS.

This action does not involve technical standards and therefore the NTTAA does not apply.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898, ''Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,'' provides for Federal agencies to consider the impact of programs, policies, and activities on minority populations and low-income populations, including tribes.

As described above, in making its determination as to whether it is ''appropriate and necessary'' to regulate Utility Units under section 112, EPA considered the effects of utility HAP emissions on both the general population and sensitive subpopulations, including subsistence fish-eaters. EPA's analysis considered such subpopulations as the Chippewa in Minnesota, Wisconsin, and Michigan; and the Hmong in Minnesota and

Wisconsin. As explained above, the Agency has concluded that it is not ''appropriate and necessary'' to regulate Utility Units under section 112, in light of all available information, including information on subsistence fish-eaters. The Agency believes that implementation of the CAIR and, independently, the CAMR will remove the hazards to public health resulting from utility HAP emissions.

This action, however, does not actually regulate HAP emissions from utilities. The CAMR does regulate Hg emissions from utilities, and it is in the CAMR rulemaking that EPA has addressed the impacts of that regulation on the populations addressed by Executive Order 12898.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.,* as added by SBREFA of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the U.S. The EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the U.S. prior to publication of the rule in the **Federal Register**. The final rule is not a ''major rule'' as defined by 5 U.S.C. 804(2). The final rule will be effective on March 29, 2005.

Dated: March 15, 2005.

Stephen Johnson,

Acting Administrator.

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