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

No. 05-1097 (and consolidated cases) COMPLEX

STATE OF NEW JERSEY, *et al.*
Petitioners,
v.
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY,
Respondent.

On Petition for Review of Final Rules of The
United States Environmental Protection Agency

JOINT BRIEF OF STATE RESPONDENT-INTERVENORS, INDUSTRY RESPONDENT-INTERVENORS, AND STATE AMICUS

The States of North Dakota, Alabama, Indiana, Nebraska, South Dakota, Wyoming, and Industry Respondent-Intervenors Utility Air Regulatory Group, Edison Electric Institute, Duke Energy Indiana, Inc., Duke Energy Kentucky, Inc., Duke Energy Ohio, Inc., PPL Corporation, PSEG Fossil LLC, NRG Energy, Florida Power and Light, and National Mining Association, and State Amicus West Virginia, Department of Environmental Protection

---

Troy King, Attorney General
Milt E. Belcher, Assistant Attorney General
11 South Union Street
Montgomery, Alabama 36130-0152
(334) 242-7300

State of Alabama

Wayne Stenehjem, Attorney General
600 East Boulevard Avenue
Bismarck, ND 58505-2210
(701) 328-2210
Paul Seby, Special Assistant Attorney General
McKenna, Long & Aldridge LLP
1875 Lawrence St., Suite 200
Denver, CO 80202
Lyle Witham, Assistant Attorney General
State of North Dakota

(Additional counsel listed on the back of this cover page)

Dated: May 18, 2007
FINAL: July 23, 2007

Steve Carter, Attorney General
Thomas M. Fisher, Solicitor General
302 West Washington Street
Indianapolis, IN 46204-2770
(317) 232-7979

State of Indiana

Lawrence E. Long, Attorney General
Roxanne Giedd, Dep. Attorney General
500 East Capitol Street
Pierre, SD 57501-5070
(605) 773-3215

State of South Dakota

Mark J. Rudolph
Senior Counsel
Office of Legal Services
West Virginia Department of
Environmental Protection
601 57th Street SE
Charleston, WV 25304
(304) 926-0460

State of West Virginia, Department of Environmental Protection, Amicus

Peter H. Wyckoff
Pillsbury Winthrop Shaw Pittman LLP
2300 N Street, NW
Washington, DC 20037
(202) 663-8007

For Duke Energy Indiana, Inc., Duke Energy Kentucky, Inc., and Duke Energy Ohio, Inc.

Henri D. Bartholomot
Edison Electric Institute
701 Pennsylvania Avenue, NW
Washington, DC 20004
(202) 508-5000

For Edison Electric Institute

Jon C. Bruning, Attorney General
Jodi Fenner, Assistant Attorney General
2115 State Capitol
Lincoln, NE 68509-8920
(402) 471-2682

State of Nebraska

Patrick Crank, Attorney General
Nancy Vehr, Assistant Attorney General
123 Capitol Building
Cheyenne, WY 82002
(307) 777-6869

State of Wyoming

Henry V. Nickel
F. William Brownell
Lee B. Zeugin
Hunton & Williams LLP
1900 K Street,
Washington, DC 20006
(202) 955-1500

For Utility Air Regulatory Group

William M. Bumpers
Debra J. Jezouit
Baker Botts, L.L.P.
1299 Pennsylvania Ave., NW
Washington, DC 20004-2400
(202) 639-7700

For PPL Corporation, PSEG Fossil LLC, NRG Inc., and Florida Power & Light Company

Peter Glaser
Troutman and Sanders, LLP
401 9th St., NW, Suite 1000
Washington, DC 20004
(202) 274-2950

For the National Mining Association

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF NEW JERSEY, et al.	)	
	)	
Petitioners,	)	
v.	)	**No. 05-1097 and**
	)	**Consolidated Cases**
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
Respondent.	)	

CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES

Pursuant to Circuit Rule 28(a)(1), the undersigned counsel for Respondent-Intervenor the Utility Air Regulatory Group ("UARG") submits this certificate as to parties, rulings and related cases.

A. PARTIES AND *AMICI*

All parties and *amici* are listed in the brief of Government Petitioners State of New Jersey, *et al.* except for Intervenors State of Maryland, WEST Associates, and National Mining Association and for Amicus State of West Virginia, Department of Environmental Protection.

Rule 26.1 Disclosure Statements:

i) UARG is a not-for-profit association of individual electric generating companies and national trade associations that participates collectively in administrative proceedings, and in litigation arising from those proceedings, that affect electric generators under the Clean Air Act. UARG has no outstanding shares or debt securities in the hands of the public and has no parent company. No publicly held company has a 10% or greater ownership interest in UARG.

ii) Duke Energy Indiana, Inc., Duke Energy Kentucky, Inc., and Duke Energy Ohio, Inc., together f/k/a Cinergy Corporation, are publicly-held companies that are the operating business units of Duke Energy Corporation. Duke Energy Indiana, Inc. generates, transmits, distributes, and sells electricity in the State of Indiana. Duke Energy Kentucky, Inc. generates, transmits, distributes, and sells electricity in the State of Kentucky. Duke Energy Ohio, Inc. generates, transmits, distributes, and sells electricity in the State of Ohio. Each company is wholly-owned by their parent company, Duke Energy Corporation (a Delaware corporation). No other publicly-held entity owns 10% or more of any of the Petitioners' stock.

iii) PPL Corporation ("PPL") is a corporation organized under the laws of the Commonwealth of Pennsylvania. There is no parent corporation or publicly-held corporation that owns 10% or more of the outstanding units of PPL.

iv) PSEG Fossil is a limited liability company organized under the laws of the State of Delaware. PSEG Fossil is wholly-owned by PSEG Power LLC.

v) Florida Power & Light Company ("FPL") is a corporation organized under the laws of the State of Florida. FPL is the principal subsidiary of FPL Group, Inc. ("FPL Group"), an investor-owned company trading on the New York Stock Exchange. FPL Group owns 100% of FPL's stock.

vi) NRG Energy, Inc. ("NRG") is a corporation organized under the laws of the State of Delaware. There is no parent corporation or publicly-held corporation that owns 10% or more of the outstanding units of NRG.

vii) The National Mining Association ("NMA") is an incorporated national trade association whose members include the producers of most of America's coal, metals, and industrial and agricultural minerals; manufacturers of mining and mineral processing machinery, equipment, and supplies; and engineering and consulting firms that serve the mining industry.

NMA has no parent companies, subsidiaries or affiliates that have issued shares or debt securities to the public, although NMA's individual members have done so.

viii) The Edison Electric Institute ("EEI") is a nonprofit trade association that represents investor-owned electric utility companies. EEI has no parent company, subsidiaries or affiliates that have issued shares or debt securities to the public.

B. RULINGS UNDER REVIEW

References to the final actions by EPA at issue in these consolidated cases appear in the brief of Government Petitioners.

C. RELATED CASES

The matters under review have not been previously heard in this or any other court. There are no related cases pending before this court.

Respectfully submitted,

Lee B. Zeugin
Henry V. Nickel
F. William Brownell
Lee B. Zeugin
HUNTON & WILLIAMS LLP
1900 K Street, N.W.
Washington, D.C. 20006
(202) 955-1500

Dated: May 18, 2007
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Counsel for the Utility Air Regulatory Group
on behalf of all Respondent-Intervenors included on
this Brief

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* Cases chiefly relied upon are marked with an asterisk

GLOSSARY OF TERMS AND ABBREVIATIONS

CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CAMR	Clean Air Mercury Rule
EGU	Electric Generating Unit
EPA	United States Environmental Protection Agency
HAP	Hazardous Air Pollutant
Hg	Mercury
MACT	Maximum Achievable Control Technology
Mercury Study	Mercury Study to Congress (Dec. 1997)
Ni	Nickel
RIA	Regulatory Impact Analysis
RfD	Reference Dose
SCR	Selective Catalytic Reduction Control
UARG	Utility Air Regulatory Group
Utility Study	Study of Hazardous Air Pollutant Emissions from Electric Steam Utility Units -- Final Report to Congress (Feb. 1998)

PERTINENT STATUTES AND REGULATIONS

All applicable statutes, regulations and legislative history are contained in the briefs of Respondent U.S. Environmental Protection Agency ("EPA") and of Petitioner State of New Jersey, and to the extent not therein, are set forth in the addendum to this brief.

ISSUES PRESENTED FOR REVIEW

1. Did EPA Administrator Browner's December 2000 notice purporting to list electric utility generating units ("EGUs") under §112(c) limit the discretion of future EPA Administrators to determine under §112(n)(1)(A) whether EGUs should be regulated?

2. Is EPA's May 2005 rulemaking determination that it is neither "appropriate" nor "necessary" to regulate EGU mercury emissions under CAA §112 lawful and supported by the record?

3. Is CAMR lawful and supported by the record?

STATEMENT OF THE CASE

When Congress overhauled the Clean Air Act ("CAA" or "Act") in 1990, it had a clear vision for controlling hazardous air pollutant ("HAP") emissions from EGUs and from other sources. In general, Congress provided that §112 regulation begins with categorizing sources, then moves to rulemakings to set stringent technology-based standards, and then further rulemakings to address any unacceptable residual risk. In contrast, Congress concluded that this general framework did not make sense for EGUs.[1] Congress knew that other parts of the 1990

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[1] *See* 136 Cong. Rec. S16899 (Oct. 27, 1990) (Senator Burdick noted: "a full control program in the United States requiring dry scrubbers and baghouses to control mercury emissions from coal-fired EGUs would double the costs of acid rain control with no expectation of perceptible improvement in public health"); 136 Cong. Rec. H12934 (Oct. 26, 1990) (Rep. Oxley stated: "if the Administrator regulates any [EGUs], he may regulate only those units that he determines -- after taking into account compliance with all provisions of the act and any other

Amendments, notably the Acid Rain program, would impose substantial compliance requirements on EGUs that would reduce indirectly EGU HAP emissions. As a result, information on the public-health implications of any remaining HAP emissions, as well as the efficacy and costs of further control, required further study.[2] Consequently, Congress did not apply the new HAP-control framework to EGUs, but rather asked EPA to decide whether to regulate EGU HAP emissions after imposition of the other CAA requirements. This broad delegation took the form of CAA §112(n)(1)(A), which requires EPA to study EGU HAP emissions and to determine if further regulation is "appropriate and necessary."

The two central issues in this case relate to how EPA carried out this broad delegation of authority under §112(n)(1)(A). The first is whether certain findings made by EPA's Administrator in December 2000, in the closing hours of the Clinton Administration, precluded subsequent Administrators from exercising the discretion Congress delegated EPA in §112(n). The second is whether the subsequent interpretations and policy judgments that EPA made in carrying out those tasks were reasonable and adequately supported.

As the long history of EPA's efforts to implement §112(n)(1)(A) shows, the December 2000 finding did not limit the discretion of future Administrators under §112(n). Moreover, EPA's subsequent rulemaking actions were reasonable and fully supported by one of the most extensive records ever compiled under the CAA.

A. The Clean Air Act

Section 112 was added to the CAA in 1970. The 1970 Act required EPA to make a risk-based determination in order to regulate substances as HAPs: EPA may regulate substances

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Federal, State, or local regulations and voluntary emission reductions -- have been demonstrated to cause a significant threat of adverse effects on the public health").

[2] *See id.*

"reasonably ... anticipated to result in an increase in mortality or an increase in serious ... illness," to a level that protects public health with an "ample margin of safety." CAA §112(a)(1). Under this provision, EPA regulated a number of HAPs emitted from industrial source categories other than EGUs. *See* 40 CFR Part 63.

As for EGUs, EPA found that the combustion of fossil fuels produces extremely small releases of a broad variety of substances that are present in trace amounts in fuels and that are removed from the gas stream by control equipment installed to satisfy other CAA requirements. EPA found that these HAP releases did not pose hazards to public health. *See* 48 Fed. Reg. 15,076, 15,085 (1983) (radionuclides). In the case of mercury specifically, EPA found that "coal-fired power plants ... do not emit mercury in such quantities that they are likely to cause the ambient mercury concentration to exceed" a level that "will protect the public health with an ample margin of safety." 40 Fed. Reg. 48,297-98 (1975) (mercury); 52 Fed. Reg. 8,725 (1987) (reaffirming mercury conclusion).

In 1990, Congress expressed concern that the risk-based approach to HAP regulation of the 1970 CAA was time-consuming and expensive to implement for non-EGUs. *See* S.Rep. No. 101-228, at 131-33 (1989), 1990 U.S. Code Cong. & Admin. News at 3385, 3516-18. Congress therefore designated 189 chemicals as HAPs under §112(b) and instructed EPA in §112(c) to list categories of "major" stationary sources of HAP emissions for the development of control technology-based emission standards under §112(d). These technology-based standards are referred to as "maximum achievable control technology" or "MACT" standards and are based on the emission reductions achieved by the best controlled similar sources. 42 U.S.C. §7412(d). To de-list a category or subcategory of major sources from this technology-based program, EPA must make a risk-based determination. CAA §112(c)(9). For non-EGUs, therefore, the 1990

CAA changed the risk-based determination from a threshold for HAP regulation to a criterion for "de-listing" a major source category.

By contrast, in §112(n)(1)(A), Congress instructed EPA *not* to regulate EGU HAP emissions until it completed a study of the "hazards" to public health "reasonably anticipated to occur" as a result of EGU HAP emissions, and after considering the impact of *"imposition of the requirements of this Act"* on those emissions. As part of that evaluation, Congress also directed EPA to "develop and describe" *"alternative control strategies"* (which EPA has always understood to include emission trading strategies[3]) for any HAP emissions that "may warrant regulation under this section." Finally, Congress told EPA to regulate HAP emissions from EGUs under §112 only to the extent it found, after rulemaking, that regulation was *"appropriate and necessary after considering the results of the study"* required by §112(n)(1)(A).

In implementing provisions such as §112, CAA §307(d) provides rulemaking procedures that apply in lieu of the Administrative Procedures Act rulemaking requirements. In §307(d)(1)(C), Congress directed that these procedures "appl[y] to...any regulation under section 112...(n)."

Apart from §112, §111 is one of a number of other CAA programs used to regulate EGU emissions. *See, e.g.,* 40 C.F.R. Part 60, Subparts D and Da. Section 111 standards for EGUs cover substances such as particulate matter that is comprised, in part, of listed HAPs, and substances such as sulfur dioxide and nitrogen oxides whose control results in reduction of HAPs. *See* 48 Fed. Reg. at 15,085. Section 111 authorizes EPA to establish "standards of performance," 42 U.S.C. §7411(a)(1), for new and existing sources in source categories that "cause[], or contribute[] significantly to, air pollution which may reasonably be anticipated to

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[3] *See* 65 Fed. Reg. 79,830 (a trading approach will be considered when standards are developed).

endanger public health or welfare," 42 U.S.C. §7411(b)(1)(A). Standards of performance must reflect "the degree of emission limitation achievable through application of *the best system* of emission reduction." 42 U.S.C. §7411(a)(1) (emphasis added). Recognizing the potential overlap between §111 and §112 regulation, Congress directed that the Administrator may prescribe §111 standards of performance for existing sources only for an "air pollutant ... which is *not ... emitted from a source category which is regulated under §112 of this title,*" 42 U.S.C. §7411(d)(1) (emphasis added).[4]

In sum, EPA can regulate EGU HAP emissions under §112 *only* if it determines, *after rulemaking*, that regulation of specific HAP emissions is "appropriate and necessary" to avoid "hazards" to "public health," and only after considering the impact of other CAA requirements and "alternative control strategies." Furthermore, regulation of a source category cannot occur simultaneously under §111 and §112; EPA must choose one or the other.

B. Mercury

Mercury is a naturally occurring element in the Earth's crust that is released into the environment as a result of both natural processes, such as volcano eruptions and reemission from oceans and soils, and manmade processes such as gold and ore mining, municipal and medical waste incineration, fossil fuel combustion, and chlorine manufacturing. EPA has estimated that total global emissions of mercury are about 5,000 tons per year: 1,000 tons from natural sources, 2,000 tons from manmade sources and 2,000 tons from release of mercury into ambient air that has been deposited on soil or in water. 69 Fed. Reg. 4,658. Mercury is a global pollutant. Much

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[4] The statutory language of §111(d)(1) is confused because the 1990 CAA contained two different and conflicting amendments that were included in the legislation signed by the President. The House-created language is quoted above. EPA's brief explains how EPA reconciled these two amendments. *See* EPA Br. at 98-118.

of the mercury emitted enters the global pool where it circulates in the atmosphere for up to one year before depositing on soil or in water.[5]

EPA estimates that U.S. coal-fired EGUs emit about 45 tons of mercury annually, or about 1% of worldwide mercury emissions. Furthermore, EPA estimates that only about 30% of EGU mercury emissions (13.5 tons) deposits in the U.S. (By comparison, about 75% of the mercury that deposits in the U.S. originates from sources outside the U.S.) As a result, U.S. coal-fired EGUs contribute only about 8% of the total annual mercury deposited across the U.S. *See* 70 Fed. Reg. 16,019.

In nature, mercury is found in elemental, organic (methylmercury) and inorganic forms. 69 Fed. Reg. 4,657. The primary route of human mercury exposure is by consumption of methylmercury in fish. 69 Fed. Reg. 4,658. Methylmercury is principally formed by microbial action in the top layers of sediment in water bodies, after mercury has precipitated from the air and deposited into those waters. Once formed, methylmercury bioaccumulates in the aquatic food chain, ultimately reaching large predator fish consumed by humans. *See* Utility Study at 7-1 (JA100).

Fossil fuel combustion by EGUs produces trace amounts of three forms of mercury: elemental, particulate, and gaseous ionic. 70 Fed. Reg. 16,011. EGUs do not produce or emit organic forms of mercury, like methylmercury. The mercury deposited in the U.S. as a result of EGU emissions must be transformed in the environment into methylmercury before it can enter the food chain and contribute to human exposure. As EPA recognizes, only a fraction of the 13.5

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[5] *See* Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units -- Final Report to Congress, at 7-7 (Feb. 1998)(the "Utility Study") (Docket No. A92-55-I-A-90)(SJA325).

tons of EGU mercury emissions deposited in the U.S. actually enters water bodies, and only a fraction of that deposition is transformed into methylmercury.[6]

C. EPA's §112(n)(1)(A) Rule

Shortly after enactment of the 1990 CAA, EPA began updating information on the types and amounts of HAPs emitted from the combustion of coal, oil and gas by EGUs. EPA also collected information on the health effects of those HAPs, and conducted modeling to determine how those emissions may affect public health. The products of these efforts were reported in the Mercury Study[7] and the Utility Study, published in December 1997 and February 1998, respectively. The Utility Study did not contain a §112(n)(1)(A) regulatory determination whether regulation of certain HAPs under §112 was "appropriate and necessary." Utility Study, at ES-1 (JA65). Instead, EPA stated that it "believes that mercury from coal-fired utilities is the HAP of greatest potential concern and merits additional research and monitoring" to inform a regulatory determination. Utility Study, at ES-27(JA91). EPA also noted a "potential concern" about nickel emissions from oil-fired plants, but noted that "significant uncertainties" exist about the form and health effects of those emissions.

Following issuance of the Utility Study, EPA undertook several efforts to advance its understanding of mercury health effects and of the quantity and form of mercury emissions from

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[6] *See* Regulatory Impact Analysis, Section 3 (EPA-HQ-OAR-2002-0056-6194)(JA1964-2022).

[7] Mercury Study to Congress (Dec. 1997) (the "Mercury Study") (Docket No. A92-55-I-A-125). The Mercury Study is a "state-of-the-science" report focused on mercury emissions from all sources, the health and environmental effects of those emissions, and technologies for controlling mercury. 42 U.S.C. §7412(n)(1)(B).

coal-fired EGUs.[8] At Congress' direction, EPA asked the National Academy of Sciences ("NAS") to review the toxicological effects of methylmercury and to make recommendations regarding an appropriate reference dose ("RfD"). The NAS National Research Council panel found that EPA's RfD for methylmercury was "scientifically justified."[9] EPA also issued two information collection requests to EGUs. The first required all coal-fired EGUs to collect coal samples throughout 1999 and to analyze those samples for mercury content. The second required approximately 80 EGUs to conduct stack sampling of their mercury emissions over a three-day period. EPA never undertook a corresponding effort to obtain information about nickel emissions from oil-fired EGUs, the nickel species emitted, or the risks such emissions might represent.

On December 14, 2000, days before the Clinton Administration left office and well before EPA could complete the data collection and research it said was necessary to make a §112(n)(1)(A) determination, then-departing Administrator Browner published, without any rulemaking, a "notice of regulatory finding." This notice announced her "conclusion" that regulation of mercury emissions from coal-fired EGUs and nickel emissions from oil-fired EGUs was "appropriate and necessary" under §112. 65 Fed. Reg. 79,825 (Dec. 20, 2000). Because necessary research had not been completed, the notice neither described the increment of emissions whose control was "necessary and appropriate" under §112, nor the "alternative control strategies warranted to address those emissions under this section." Indeed, Administrator Browner acknowledged that EPA could not at that time quantify the amount of

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[8] In the Utility Study, EPA identified eleven areas where additional mercury research was needed. Utility Study, at 14-8 and 14-9 (SJA326-327). EPA's post-Utility Study work focused on four of those areas of scientific need.

[9] National Research Council, *Toxicological Effects of Methylmercury,* at 9 (2000) (Docket No. A92-55-I-A-137) (SJA329).

methylmercury (the form of mercury of health concern) in U.S. fish attributable to mercury emissions from domestic coal-fired EGUs. 65 Fed. Reg. 79,827.

Administrator Browner explained "it is unnecessary to solicit...public comment on today's finding [because]...[t]he regulation developed subsequent to the finding will be subject to public review and comment." 65 Fed. Reg. at 79,831, cols. 1-2. In that future rulemaking, she explained, EPA would consider alternative control strategies, including "economic incentives such as emissions trading." *Id.* at 79,830.

UARG, one of the parties on this brief, sought review of the December 2000 notice in this Court.[10] UARG planned to argue that Administrator Browner's "appropriate and necessary" finding was not factually justified and that EPA had violated CAA §§112(n)(1)(A) and 307(d) by issuing the finding and by purporting to list EGUs under §112(c) as a "major" source category based on that finding. In response, EPA filed a motion to dismiss advising this Court that "[b]ecause 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 rulemaking."[11] On July 26, 2001, this court granted EPA's motion to dismiss.

Following the December 2000 notice, EPA conducted a comprehensive §112(n)(1)(A) rulemaking. In that rulemaking, EPA considered a number of regulatory options, including: (1) no further regulation of EGU mercury emissions, or (2) adoption of legislative rules regulating EGU mercury emissions under §112(d), or (3) adoption of legislative rules under §112(n)

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[10] *Utility Air Regulatory Group v. EPA*, No. 01-1074 (2001).

[11] EPA's Motion to Dismiss, at 9 (emphasis added); *see also* EPA's Reply in Support of Motion to Dismiss, at 4 ("the entire predicate for EPA's finding determination and listing decision (both legal and factual) is susceptible to further comment and administrative review"); 70 Fed. Reg. 15,996.

addressing any EGU emissions that are "appropriate and necessary" to regulate, or (4) adoption of legislative rules under other CAA sections that make further controls inappropriate and unnecessary under §112.[12] EPA also completed extensive scientific and technical studies to address the areas of research need identified in the Utility Study.[13] Commentors submitted detailed technical information on EGU mercury emissions and on the health consequences of those emissions.[14] The result is a rulemaking record that is the most detailed record ever developed by EPA to support regulatory action under §112.

In particular, EPA conducted extensive modeling to analyze how changes in mercury emissions from coal-fired EGUs would affect U.S. mercury deposition and methylmercury levels in fish for a range of cases.[15] EPA's analyses included an alternative scenario assuming zero mercury emissions from all EGUs. The modeling showed that total mercury deposition in the U.S. is not significantly impacted by mercury deposition from EGUs, and that EGUs contribute a "relatively small percentage" to fish tissue methylmercury levels in the U.S. 70 Fed. Reg. 16,019-20. More importantly, the modeling showed that the implementation of other requirements of the Act produces the vast majority of the reductions in U.S. mercury deposition and in U.S. methylmercury levels in fish tissue that can be achieved by controlling mercury

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[12] *See* 69 Fed. Reg. 4,652.

[13] EPA's factual results and conclusions are presented in a series of technical support documents ("TSDs") and other technical reports contained in the rulemaking record, and numbering several thousand pages.

[14] *See, e.g.,* UARG Mercury Comments (EPA-HQ-OAR-2002-0056-2922); UARG NODA Comments (EPA-HQ-OAR-2002-0056-5497); EPRI Mercury Comments (EPA-HQ-OAR-2002-0056-2578); EPRI NODA Comments (EPA-HQ-OAR-2002-0056-5502).

[15] EPA's modeling is summarized in the preamble to the §112(n)(1)(A) rule. 70 Fed. Reg. 16,011-25.

emissions from coal-fired EGUs.[16] Thus, EPA concluded "[t]hat modeling reveals the implementation of section 110(a)(2)(D), through CAIR, would result in a level of [mercury] emissions from Utility Units that would not cause hazards to public health." 70 Fed. Reg. 16,004.

On March 29, 2005, EPA concluded its §112(n)(1)(A) rulemaking. Regarding mercury, EPA found that "[b]ecause this new information demonstrates that the level of Hg [mercury] emissions projected to remain 'after imposition of' section 110(a)(2)(D) [*i.e.*, CAIR] 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." *Id.* at 16,004. EPA similarly concluded that it is not appropriate or necessary to regulate nickel from oil-fired EGUs, because it "do[es] not anticipate that the remaining level of utility nickel emissions will result in hazards to public health" based on "(1) the significant reduction in total nationwide inventory of oil-fired Utility Units; and (2) the changing fuel mixtures being used at the remaining units." *Id.* at 16,007-08. EPA therefore removed EGUs from the §112(c) list because the December 2000 notice "lacked foundation" and because §112 regulation was neither appropriate nor necessary. *Id.* at 15,994.

D. The Clean Air Mercury Rule ("CAMR")

On the same day EPA issued its §112(n)(1)(A) rule, it decided to regulate further mercury emissions from coal-fired EGUs under CAA §111. 70 Fed. Reg. 28,606. EPA decided *not* to regulate oil-fired EGUs under §111 on the ground that "there are fewer oil-fired units in operation and that Ni [nickel] emissions had diminished since the Utility Study." *Id.* at 28,611.

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[16] *See id.* The control equipment installed to meet EPA's "Clean Air Interstate Rule" ("CAIR") and other CAA requirements will remove most of the ionic and particulate mercury presently emitted from EGUs -- the two forms of mercury that can deposit in the U.S. (elemental mercury generally does not deposit in the U.S. but enters the global pool). *See* Effectiveness TSD, at 1 (EPA-HQ-OAR-2002-0056-6186)(JA1873).

EPA interpreted the term "standard of performance" in §111(a) to include emission trading systems and determined that the "best system of [mercury] emission reduction" for existing EGUs was a national cap-and-trade program that ensured that (i) mercury emissions were limited in accordance with the "best system" of emissions control, and (ii) that mercury emissions from coal-fired EGUs -- both existing and new -- were capped so total emissions could never increase in the future as new facilities were built to meet increased electricity demand. 70 Fed. Reg. 28,616 col. 3, 28,617 col. 2.

CAMR sets emission limits for new EGUs and establishes a nationwide cap-and-trade program for mercury emissions from *all* coal-fired EGUs. Total mercury emissions from all EGUs are capped at 38 tons per year ("tons/yr") in 2010 and 15 tons/yr beginning in 2018. CAMR's cap-and-trade program is implemented through state plans developed under §111(d). Based on the extensive analyses performed for the §112(n)(1)(A) regulatory determination, EPA found that the additional mercury controls required by CAMR would result in "relatively small" additional reductions in mercury deposition in the United States when compared to the imposition of other CAA requirements, including CAIR, and that going beyond CAMR to zero emissions would produce little or no health benefits. 70 Fed. Reg. 16,019-20.

E. Petitions for Reconsideration

After EPA published its §112(n)(1)(A) rule and CAMR, two petitioners in this case filed petitions seeking reconsideration of both CAMR and EPA's §112(n)(1)(A) rule regarding coal-fired EGU mercury emissions and oil-fired EGU nickel emissions.[17] On October 28, 2005, EPA agreed to reconsider these decisions. EPA requested additional comment on several aspects of its §112(n)(1)(A) rule, including its legal interpretation of §112(n)(1)(A), the detailed technical

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[17] No petitioner has challenged EPA's decision not to regulate EGU nickel emissions under §111.

and scientific analyses of the impact of EGU mercury emissions on public health, and information on oil-fired EGU nickel emissions. 71 Fed. Reg. 33,390.

After considering the petitions for reconsideration and the additional comments received in response, EPA found no reason to make any substantive revisions to its §112(n)(1)(A) rule or CAMR. 71 Fed. Reg. 33,388. EPA's detailed 306-page response to comments[18] addresses, among other issues, petitioners' claims (1) that mercury hot spots exist or will be created by EPA's regulatory actions,[19] (2) that EPA analyzed only mercury exposures resulting from the self-caught freshwater fish exposure scenario,[20] (3) that EPA had failed to consider the background levels of mercury (even though EPA analyzed the case where EGU mercury emissions were reduced to zero and found that "virtually none of the risks to public health stemming from the global pool would be reduced"),[21] (4) that EPA misused certain surveys of tribal fish consumption,[22] and (5) that a small group of tribe members were theoretically exposed to methylmercury levels above the RfD.[23]

SUMMARY OF ARGUMENT

EPA's §112(n)(1)(A) rule and CAMR are the culmination of the most extensive §112 rulemaking ever undertaken. Congress treated EGUs differently from all other sources under

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[18] Response to Comments: Reconsideration of Final Section 112(n) Revision Rule and CAMR, May 31, 2006 (EPA-HQ-OAR-2002-0056-6722). Petitioners make *no mention* of EPA's Response to Comments nor do they explain why EPA's rejection of their factual claims in that document was unreasonable or made without considering their claims.

[19] *Id.* at 134-52 (JA3803-21).

[20] *Id.* at 118-24 (JA3796-802).

[21] *Id.* at 41-46 (JA3742-47).

[22] *Id.* at 66-78 (JA3767-79).

[23] *Id.* (JA3776).

§112, requiring EPA to study EGU HAP emissions to determine whether further §112 regulation of EGUs was "appropriate" and "necessary." EPA's March 2005 decision that §112 regulation of EGUs is neither "appropriate" nor "necessary" comports with the language of §112(n)(1)(A) and is supported by an extensive factual record.

Petitioners' principal challenge to EPA's §112(n) rule rests on a faulty claim that a December 2000 notice and listing of EGUs as a major source category under §112(c) bound all subsequent EPA Administrators to regulate EGUs under the §112(d) MACT provisions. EPA has consistently maintained that the December 2000 notice was not final agency action and that parties had the right to comment on the legal and factual bases for that notice during subsequent rulemaking proceedings. When EPA completed its §112(n) rulemaking and issued its final determination that regulation of EGUs under §112 was not "appropriate" or "necessary," EPA was required to withdraw the non-final listing of EGUs under §112(c) because the factual predicate for §112 regulation no longer existed.

As explained in detail in EPA's brief, CAMR is consistent with the language of §111. Petitioners primary factual challenge to CAMR, namely that mercury "hot spots" may be created, was fully considered and rejected by EPA during the rulemaking process.

ARGUMENT

I. EPA's May 2005 §112(n)(1)(A) Rule Is Lawful and, as a Result, There Is No Basis for Including EGUs on the §112(c)(1) List.

In the §112(n) rule, EPA found that it was neither "appropriate" nor "necessary" to regulate any EGU HAP emissions (including mercury and nickel) under §112. While petitioners sought administrative reconsideration of EPA's §112(n)(1)(A) determination not to regulate oil-fired EGU nickel emissions, they did not seek review of, or otherwise challenge, EPA's decision regarding nickel.[24] Petitioners challenge *only* EPA's decision not to regulate coal-fired EGU mercury emissions under §112, and they further challenge the §111 standard of performance EPA promulgated for EGU mercury emissions. For the reasons discussed below, Petitioners' arguments are inconsistent with the CAA and with basic tenets of administrative law.

A. A §112(n)(1)(A) Determination Is a Precondition to Regulation of EGU HAP Emissions Under §112.

In CAA §§112(n)(1)(A) and 307(d), Congress provided that EGUs may only be regulated under §112 following a notice and comment rulemaking that addresses whether it is "appropriate and necessary" to regulate HAP emissions "after imposition of the requirements of this Act," and after consideration of "alternative control strategies for any emissions that warrant regulation under this section." No one disputes that no §112(n) rulemaking was completed, much less conducted, when Administrator Browner purported to list EGUs under §112(c)(1).

According to Petitioners, however, the mere issuance of the non-final December 2000 notice subjected EGUs to the regulatory regime that Congress crafted for non-EGU major source categories, and precludes subsequent EPA Administrators from exercising the authority delegated by Congress in §112(n).[25] Under that different regime, according to petitioners, EGUs are subject to §112(d) MACT regulation absent a risk-based §112(c)(9) de-listing, under which one must show that "no source in the category" exceeds an emission level that protects public health *and* the environment.

But Congress included §112(n) specifically because it found the technology-based approach to regulation of non-EGUs was inappropriate for EGUs absent a §112(n) rulemaking

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[24] *Cf. Nat'l Lime Ass'n v. EPA*, 233 F.3d 625, 633 (D.C. Cir. 2000) (challenge not presented in opening brief is waived).

[25] *See* Gov't Ptrs. Br. at 12-13; Env'l Br. at 15-16.

determination. Thus, for example, when Congress addressed the listing of categories of sources of mercury for §112(d) regulation in §112(c)(6) it specifically provided that "[t]his paragraph shall not be construed to require the Administrator to promulgate [MACT] standards for [EGUs]." In short, §112(n)(1)(A) makes little sense if, as petitioners argue, that provision can be cast aside merely by a conclusory "notice" that fails to undertake the analyses or to consider the factors required by §112(n) to make a regulatory determination.

Furthermore, as EPA explains, it has previously revoked "non-final" §112(c) listing actions when it found after rulemaking that stationary sources in the category were not "major," even though it had initially listed the source category as "major." *See* 69 Fed. Reg. 4,689 col. 2. Because a MACT standard is authorized only for a category of "major" stationary sources, once it is established through rulemaking that a source category does not satisfy the statutory predicate for listing, no MACT standard is authorized and the §112(c) listing must be withdrawn without making a §112(c)(9) finding. Similarly, when EPA determined following §112(n) rulemaking that regulating EGUs under §112 was neither "appropriate" nor "necessary," the non-final listing of EGUs under §112(c)(1) had to be withdrawn because the predicate for listing no longer existed.[26]

B. Administrator Browner's December 2000 Notice Was Not Final Action That Deprived Subsequent EPA Administrators of Authority to Act Under §112(n).

Government petitioners agree that §112(n) plays a "threshold role"[27] to "determine the nature of boiler emissions and *whether their control is warranted*."[28] In a similar vein,

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[26] EPA withdrew its listing for both coal- and oil-fired EGUs. Petitioners have challenged only EPA's §112(n) determination for coal-fired EGUs.

[27] *See* Gov't Ptrs. Br. at 16.

[28] *Id.* at 17 (emphasis added).

environmental petitioners explain that §112(n)(1)(A) "provides a process for deciding *whether to regulate utility units under §112*."[29] According to petitioners, however, this "threshold role" was discharged by Administrator Browner's December 2000 notice of regulatory finding. Even if true, which it is not for the reasons discussed above, Administrator Browner's action did not restrict future EPA Administrators' discretion to make a §112(n) determination through rulemaking.

No one disputes that, when EPA issued its December 2000 notice, it had *not* undertaken a §112(n) rulemaking,[30] had *not* completed the scientific research it had previously identified as being a necessary predicate for a regulatory determination, and had *not* considered all of the factors required for a §112(n)(1)(A) determination (including the impact on EGU mercury emissions of the "imposition of the requirements of this Act" and "alternative control strategies...under this section"). Thus, EPA explained to this Court in April 2001 that the December 2000 §112(n) notice and §112(c) listing of EGUs were not final agency action.[31]

An EPA Administrator can bind future Administrators only by completing a legislative rulemaking, not by issuing a notice shielded from public comment and judicial review. Thus, for example, in *Thomas v. State of New York,* 802 F.2d 1443 (D.C. Cir. 1986), this Court addressed whether a letter sent, in which an outgoing Administrator concluded that acid deposition was endangering public health in the U.S. and Canada, obligated future EPA Administrators to take regulatory action under CAA §115. This Court found that an agency statement which binds subsequent Administrators is a statement of future effect designed to implement law or policy,

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[29] *See* Env'l Br. at 16 (emphasis added).

[30] *See* EPA Br. at 8.

[31] EPA's Motion to Dismiss, at 9 (emphasis added).

and is therefore a "rule." *Id.* at 1446. Because the Administrator had not issued the letter through notice-and-comment rulemaking, this Court found that it was not a "rule" and thus could have no binding effect. *Id.* at 1447.

Similarly, when EPA has taken action that has future regulatory consequences, like "approval" or "disapproval" of a State Implementation Plan (which transforms state-adopted regulations either into federally enforceable ones or refuses to give them federal effect), the courts have uniformly held that EPA must do more than simply publish a notice in the *Federal Register*. Instead, EPA must conduct a "notice and comment" rulemaking in order to create enforceable obligations with future consequences.[32]

For these reasons as well, Petitioners' argument that EPA was required to follow the delisting requirements of §112(c)(9) to remove coal- and oil-fired EGUs from the §112(c) list of major sources has no merit.

C. Unlike Administrator Browner's December 2000 Notice, EPA's March 2005 §112(n)(1)(A) Rule Is the Product of a Formal Rulemaking, and Is Both Lawful and Supported by the Record.

In reviewing past EPA CAA rules, this court has stated that its "analysis is guided by deference traditionally given to agency expertise, particularly when dealing with a statutory scheme as unwieldy and science-driven as the Clean Air Act." *Appalachian Power Co. v. EPA,* 135 F.3d 791, 801-02 (D.C. Cir. 1998); *see also Allied Local & Regional Mfrs. Caucus.v. EPA.,* 215 F. 3d 61, 73 (D.C. Cir. 2000). The Court's role is not to "second-guess the scientific judgments of the EPA." *American Mining Congress v. EPA*, 907 F. 2d 1179, 1187 (D.C. Cir.

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[32] *See, e.g., Duquesne Light Co. v. EPA,* 166 F.3d 609, 611 (3rd Cir. 1999)("Each SIP must be submitted to EPA for review and approval. The [CAA] requires a notice and comment period...").

1990); *see also Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 103 (1983). Judged against these standards, EPA's §112(n)(1)(A) rule must be affirmed.

Based on an extensive rulemaking record, and after considering voluminous public comments, EPA issued a final §112(n)(1)(A) rule on March 29, 2005 which found that §112 regulation of EGU HAP emissions (including mercury and nickel) was neither "appropriate" nor "necessary." 70 Fed. Reg. 16,002. Petitioners do *not* challenge EPA's decision not to regulate nickel emissions from oil-fired EGUs. That decision did not rely on emission reductions from CAMR or CAIR but rather had a separate and distinct regulatory basis from EPA's decision on mercury emissions. *See supra* p. 11. Petitioners limit their challenge to the claim that, with respect to mercury, EPA's §112(n)(1)(A) rule does not comply with the CAA and lacks record support.

Contrary to Petitioners' claims, EPA's interpretation of the terms "appropriate" and "necessary" is reasonable and consistent with CAA policies and purposes. EPA provides a detailed interpretation of these terms in the preamble to the final §112(n)(1)(A) rule, 70 Fed. Reg. 16,000-02, and in its brief, EPA Br. at 33-40. EPA's interpretation is logical and comports with the language of §112(n)(1)(A); it should be upheld by this Court.

Similarly, the factual record fully supports EPA's §112(n) determination. The rulemaking record contains more than one hundred scientific studies and over 5000 substantive individual comments. EPA's detailed review and consideration of the record material is reflected in the extensive preambles that accompanied the §112(n)(1)(A) rule and EPA's reconsideration of that rule, and in two lengthy responses to comments.[33] In an attempt to cast

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[33] *See* 70 Fed. Reg. 15,994-16,033; 71 Fed. Reg. 33,390-95; Response to Comments: Proposed Revision to December 2000 Finding (EPA-HQ-OAR-2002-0056-6193); Response to Comments: Reconsideration (EPA-HQ-OAR-2002-0056-6722).

doubt on this voluminous record, Petitioners have offered a variety of misstatements of fact, unbalanced characterizations of the record, extra-record material,[34] and facts that are not germane to the §112(n)(1)(A) determination. Petitioners' selective presentation does not undermine EPA's §112(n)(1)(A) rule.[35]

For example, Petitioners argue that EPA's reliance on CAIR is arbitrary and capricious because CAIR applies only in 28 states and does not require the regulation of EGUs.[36] Petitioners, however, have grossly discounted the mercury emission reductions from coal-fired EGUs that will result from implementation of CAIR and other CAA programs included in EPA's analysis (such as Title IV) that apply nationally. As EPA's analyses show, hundreds of coal-fired EGUs will install new control equipment, primarily scrubbers and selective catalytic reduction controls ("SCRs"), to meet the SO_2 and NO_x requirements of CAIR and these other programs. Scrubbers and SCRs effectively remove the particulate and gaseous ionic forms of mercury most likely to deposit within several hundred miles of a plant.[37] Petitioners present no compelling reason why EPA's analysis is wrong.

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[34] Environmental petitioners would have this court consider a report on mercury deposition in Steubenville, Ohio and a declaration by an engineering professor, ostensibly submitted as support for their standing demonstration, as a grounds for finding the § 112(n)(1)(A) rule and CAMR inadequate. *See* Env'l Br., App. I. Likewise, Government petitioners offer extra-record material including a Hubbard Brook report that was published mere days before petitioners' brief was filed, and two affidavits offering conclusory and incorrect factual assertions. *See* Govt. Ptr. Br., Affidavit of William O'Sullivan and Declaration of Raymond Vaughan. The material is not part of the administrative record and should not be considered by the Court. *See, e.g., Citizens to Preserve Overton Park, Inc. v. Volpe*, 41 U.S. 402, 420 (1971).

[35] EPA addresses many of petitioners' factual claims in its brief. *See* EPA Brief at 40-81. Respondent-intervenors support those arguments and will not repeat them here.

[36] *See* Govt. Ptr. Br. at 23; Env'l Br at 30.

[37] SCRs convert elemental mercury to the gaseous ionic form which can be removed by scrubbers. For example, plants burning bituminous coal and equipped with a cold-side

State petitioners also claim that CAIR and CAMR do not obviate the need for §112 regulation of EGU mercury emissions because §112(d) MACT standards would require a 90% reduction in mercury emissions while CAMR "requires only a 20% reduction over the next decade."[38] First, there is no evidence in the record that if EPA were to set MACT standards, those standards would require 90% control or, more importantly, would significantly reduce methylmercury levels in fish. In fact, EPA proposed MACT standards in January 2004 that subcategorized EGUs based on the rank of coal burned, with some boilers subject to much lower control levels.[39] EPA also acknowledged that MACT standards must reflect the large variability in mercury emissions that can occur at a given unit as a result of variable mercury concentrations in coal, and the effect of other trace elements on the form of mercury produced during combustion.[40] EPA's proposed MACT would have resulted in a 75% mercury reduction by bituminous-fired EGUs and 15-20% reduction by subbituminous- and lignite-fired units. This is far from the 90% reduction claimed by Petitioners.

Second, Petitioners' comparison of the mercury reductions that would occur under MACT or CAMR are wrong for another reason. The MACT percentage reductions offered by

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electrostatic precipitator and a scrubber have average mercury removal efficiencies of 60%. When an SCR is added, overall mercury removal efficiency increases to 85%. *See* UARG NODA Comments, Attachment 1, Section 5 (EPA-HQ-OAR-2002-0056-5497)(JA4247-53). EPA has recognized that there are no commercially available, mercury-specific control technologies. *See* 70 Fed. Reg. 28,614.

[38] *See* Govt. Ptr. Br. at 22.

[39] *See* 69 Fed. Reg. 4,665-70. Burning different ranks of coal produces very different mixes of mercury compounds. Particulate and gaseous ionic mercury can be controlled fairly efficiently with existing pollution control equipment. By contrast, EGUs burning subbituminous and lignite coals produce mostly elemental mercury, which is not removed to any appreciable degree by existing control equipment.

[40] *See id.* at 4,670-74.

Petitioners compare mercury in coal to mercury leaving the stack after combustion. By contrast, the mercury reductions Petitioners attribute to CAMR compare 1999 post-stack mercury emissions to post-stack mercury emissions following CAMR implementation. Because, in 1999, 40% of the mercury in the coal was removed by existing control equipment, Petitioners significantly understate the level of emissions reduction required by CAMR, while overestimating those that might be achieved by MACT. In fact, CAMR will require an average 80% mercury control efficiency from *all* coal-fired EGUs, and then cap those emissions at that level for the future.[41] Because of the cap, CAMR is more restrictive than MACT.

Petitioners also argue that, even though §112(n)(1)(A) directs EPA to assess "the hazards to public health reasonably anticipated to occur *as a result of emissions by electric utility steam generating units*" (emphasis added), EPA improperly failed to consider non-EGU mercury emissions. Petitioners' argument is contradicted by the language of §112(n). It is also wrong as a factual matter because EPA included *all* sources of mercury emissions in its modeling analyses.[42]

II. Given EPA's Finding that Mercury Emissions from Existing EGUs Do Not Present Hazards to Public Health, the Court Need Not Reach Petitioners' §111 Arguments.

As noted above, the CAA subjects "any regulation" issued under §112(n) to the §307(d) requirements for notice and comment rulemaking. Section 112(n) tells the Administrator what information he must develop in taking action under that provision. This information includes: (i) "hazards to public health" that are "reasonably anticipated" from EGU HAP emissions; (ii)

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[41] Coal samples collected from all coal-fired EGUs throughout 1999 revealed that 75 tons of mercury enter in the coal annually. CAMR caps emissions at 15 tons per year in Phase 2 thus requiring an 80% average reduction in mercury based on mercury entering all coal-fired EGUs.

[42] *See* EPA, Emissions Inventory and Emissions Processing for the Clean Air Mercury Rule, at 2-5 (EPA-HQ-OAR-2002-0056-6129)(JA1736-39).

the impact of "imposition of the [other] requirements of the Act" on those public health risks; and (iii) "alternative control strategies for emissions which may warrant regulation under this section."

By directing the Administrator in §112(n) "to develop and describe ... alternative control strategies" for addressing emissions that "may warrant regulation under [§112]," Congress signaled that control strategies for EGU HAP emissions that may warrant regulation "under this section" could differ from those control strategies that apply to *non*-EGU source categories under §112. In other words, EPA may regulate EGU emissions under §112(n) to the extent "appropriate and necessary," and not where regulation of such emissions under other subsections of §112 (*e.g.*, §112(d)) would impose requirements that either go beyond or do not reach what is "appropriate and necessary" to protect public health. This is confirmed by Congress' direction that EPA take regulatory action establishing legislative rules under *either* §112(d) *or* §112(n) following §307(d) rulemaking procedures. CAA §307(d)(1)(C).

In the notice of proposed rulemaking, EPA interpreted §112(n) as providing independent authority to adopt an alternative control strategy for EGU mercury emissions, to the extent it found some further regulation under §112 was "appropriate and necessary." *See* 70 Fed. Reg. 28,608 col. 1. EPA's reading of the Act makes eminent sense. For example, assume that EGU emissions of a HAP are 50 tons/yr, that the Administrator finds that "hazards to public health" would be eliminated by reducing those emissions to 30 tons/yr, and that imposition of other requirements of the Act would reduce emissions by 15 tons/yr, leaving 35 tons/yr. What then does §112(n) tell the Administrator to do? For this example, the Administrator could determine that the "emissions that warrant regulation under this section" are the 5 tons/yr of emissions that remain after "imposition of other requirements of the Act," because these emissions create the "hazards to public health" which make regulation under §112 "appropriate and necessary." Once the 5 tons/yr of emissions that "warrant regulation under this section" are eliminated, further regulation of EGU HAP emissions (including §112(d) regulation) would no longer be "warrant[ed] under this section" as "appropriate and necessary" to avoid hazards to public health.

In the instant case, contrary to the above hypothetical, the Administrator concluded that "the [national] level of Hg emissions [35 tons/yr] projected to remain 'after imposition of' sections 110(a)(2)(D) [i.e., the CAIR program] does not cause hazards to public health." 70 Fed. Reg. at 16,004 col. 2. On this basis, the Administrator concluded that regulation of EGU HAP emissions under §112 was not "appropriate." *Id* at 16,005, col. 1.

This finding alone would have been sufficient to end EPA's §112(n) inquiry. Nevertheless, EPA went further and promulgated CAMR under §111. As EPA explains, "CAMR ... requires even greater Hg reductions than CAIR," and will ensure that EGU mercury emissions "do[] not result in [future] hazards to public health," by imposing an industry-wide cap on EGU mercury emissions at a level *lower than* the level EPA found would eliminate "reasonably anticipated" hazards to public health from EGU emissions. *Id.* at 16,004 col. 3. Furthermore, EPA found that CAMR "dovetails well with ... [regional] emission caps under the [CAIR program]," which also limit EGU mercury emissions, but only the CAMR cap applies nationally. 70 Fed. Reg. 28,606 col. 1. For these reasons, CAMR ensures that public health risks are reduced to levels below those found to be acceptable, and that those emissions cannot increase in the future. *Id.* at 16,005.

As a result, Petitioners challenge to CAMR can produce no benefit for them. If Petitioners prevail on their challenge to EPA's §112(n) determination regarding coal-fired EGUs, the national mercury cap would disappear and this case would have to be remanded to EPA for a new §112(n) determination. If §112 regulation of EGU mercury emissions were then found to be "appropriate and necessary," a CAMR "cap and trade" program could be promulgated under §112(n). If Petitioners' challenge to EPA's §112(n) determination is rejected, however, the only result of their challenge to CAMR would be to vacate a program that provides additional mercury reductions and a national cap on EGU mercury emissions at a level below the level that EPA concluded, under §112(n), eliminates reasonably anticipated public health risks. 70 Fed. Reg. 16,004, col. 2 and 16,005, col. 1.

III. EPA's CAMR Is Lawful and Supported by the Record.

EPA explained its legal rationale for promulgating CAMR in several *Federal Register* notices.[43] It also developed detailed factual support for determining that a mercury cap-and-trade program is the appropriate §111 "standard of performance" and for the timing and levels of CAMR's annual emission caps.

Petitioners argue that EPA cannot regulate EGU mercury emissions using §111 because §111(d) prohibits the regulation of listed HAPs under that provision.[44] As explained in EPA's brief and in the preamble to the final §112(n)(1)(A) rule,[45] interpreting §111(d) required EPA to address two different and conflicting amendments to §111(d) contained in legislation signed by the President. EPA developed a reasoned way to reconcile the conflicting language and the Court should defer to EPA's interpretation.[46]

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[43] *See* 69 Fed. Reg. 4,696-98; 70 Fed. Reg. 16,029-32.

[44] Petitioners do not challenge EPA's decision to regulate EGU nickel emissions under § 111. *See supra* pp. 14-15.

[45] *See* EPA Br. at 98-118; 70 Fed. Reg. 16,029-32.

[46] *See, e.g., Citizens to Save Spencer County v. EPA*, 600 F.2d 844 (D.C. Cir. 1979).

Petitioners also claim that a cap-and-trade program is unlawful under §111. EPA has offered compelling legal justifications for a mercury cap-and-trade program. *See* EPA Br. at 119-133. A mercury cap-and-trade program is also reasonable as a matter of public policy. Mercury is a global pollutant. About 75% of the mercury that deposits in the U.S. originates from sources outside the U.S. Because a majority of the mercury currently emitted from coal-fired EGUs enters the global pool, only about 8% of the mercury that currently deposits in the U.S. comes from U.S. coal-fired EGUs, and only a small fraction of that enters water bodies and is transformed into methylmercury that ultimately finds its way to humans.

EPA designed CAMR to require near total control of the two forms of mercury that deposit locally and regionally in the U.S.[47] CAMR also imposes a hard cap on mercury emissions that will increasingly restrict mercury emissions from individual units over time as new coal-fired EGUs are built and those units receive mercury allowances.[48] Thus, CAMR maximizes reductions in U.S. mercury deposition while providing EGUs flexibility to achieve those reductions in a cost effective manner.[49]

Petitioners' main factual criticism of CAMR is that it will create mercury "hot spots" and that EPA has failed to consider this issue. Petitioners are wrong on both scores. The issue of mercury "hot spots" was the subject of extensive comments during the rulemaking process.

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[47] *See* Regulatory Impact Analysis, Chapter 8 (EPA-HQ-OAR-2002-0056-6194)(JA2026-44).

[48] Petitioners claim that compliance with CAMR's Phase 2 limits will be delayed by many years. *See* Env'l Br. at 31. CAMR does not allow delayed compliance. CAMR's emissions cap must be met annually assuring that cumulative mercury emissions can never exceed the cap. In fact, CAMR's banking and trading provisions provide incentives for *early* mercury reductions.

[49] One component in setting a §111(a) "standard of performance" is "the cost of achieving such reduction."

Comments ranged from conclusory statements about the existence of "hot spots" that neither offered a definition of the term nor presented factual evidence to support the claim, to comments that included detailed modeling results that showed how mercury deposition would be affected by different regulatory schemes. In responding to these "hot spot" claims, EPA first defined the term[50] and then provided detailed factual reasons why "hot spots" do not currently exist and why they will not result from CAMR implementation. 70 Fed. Reg. 16,025-28. Petitioners' briefs do not offer any reasons for rejecting EPA's definition of a "hot spot." Instead, they persist in making "hot spot" claims without defining that term, which leads them to cite information that sheds no light on the present or future existence of "hot spots."[51]

The rulemaking record contains two detailed modeling analyses of the mercury "hot spot" issue, performed by EPA and the Electric Power Research Institute.[52] These modeling studies looked for areas where mercury deposition from all sources of mercury emissions was above average as well as areas where EGUs contributed disproportionately to mercury deposition. In all cases, CAMR was predicted to reduce mercury deposition, not increase it. This result makes logical sense because a cap-and-trade program encourages control equipment

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[50] EPA defined 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 criterion of 0.3 mg/kg." 70 Fed. Reg. 16,026 col. 1.

[51] Petitioners rely heavily on a report on mercury deposition measures at one location -- Steubenville, Ohio -- as proof of their "hot spot" claims. *See* Govt. Ptr. Br. at 32-33; Env'l Br. at 33-34. As noted in footnote 34 above, the Steubenville study is not part of the administrative record. In any event, as EPA has explained, the Steubenville mercury deposition measurements were comparable to the deposition levels predicted by EPA's modeling work. Furthermore, the model used by the authors of the Steubenville report can only be used to look back in time. Because it cannot predict the future, the Steubenville work is of no use in answering the question of whether the implementation of CAMR will produce mercury "hot spots."

[52] 70 Fed. Reg. 16,025-28; 71 Fed. Reg. 33,391-92; EPRI Mercury Comments, at 6-11 (EPA-HQ-OAR-2002-0056-2578)(JA928-33); EPRI Reconsideration Comments, at 14-17 (EPA-HQ-OAR-2002-0056-6497)(JA2683-87).

to be installed on plants with the highest emissions so as to minimize the cost per pound of mercury removed. Thus, petitioners' claims that CAMR will create "hot spots" are baseless.

IV. The Special Interests of State Respondent-Intervenors Support the Reasonableness of Both the § 112(n) Rule and CAMR.

In the CAA, Congress assigned States the primary responsibility for the day-to-day regulation of air pollution. State respondent-intervenors have a direct regulatory and economic interest in seeing that EPA's mercury rules are affirmed. In particular, the regulation of air emissions using a cap-and-trade program has proven far more efficient than regulating each facility under a command-and-control approach. A cap-and-trade program is largely self-implementing -- compliance is judged at a single point in time based on whether a facility possesses a sufficient number of allowances to match its actual emissions. By contrast, a command-and-control program requires numerous short-term compliance demonstrations and places a heavy demand on State regulators to verify each source's continuing compliance and to decide whether and how to pursue enforcement actions when occasional exceedances occur.[53]

A cap-and-trade program also benefits State citizens by allowing market forces to govern the choice and timing of emission controls. Under a cap-and-trade program, control equipment is generally installed first at those plants where the cost of control per unit of emissions is the lowest, which are generally the largest and highest emitting facilities. Moreover, in the heavily regulated industry of electricity production, lower compliance costs associated with a cap-and-trade approach will inevitably be passed on to the citizens of each State.

State respondent-intervenors also favor CAMR because it provides States broad discretion in deciding how to allocate mercury allowances among EGUs. This discretion, which

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[53] Since both regulatory approaches require continuous emission monitoring, the emissions information available to State regulatory agencies is the same. A cap-and-trade program has the effect of smoothing out the "noise" in instantaneous emission measurements.

is not available under a command-and-control approach, allows State regulators to tailor a State's mercury plan to address such issues as new source set asides to permit construction of new capacity to meet electricity demand growth, the banking of allowances to encourage the retirement of older, less efficient EGUs, and incentives to promote the installation of novel mercury controls.

Finally, State respondent-intervenors have significant doubts about whether mercury "hot spots" will be caused by CAMR's implementation, given the record which shows no significant hot spots and given that larger facilities are controlled first under such a program. Nevertheless, States retain ample legal authority to address any demonstrated instance of mercury hot spots. CAA §116 allows States to adopt state standards that are more stringent than EPA's §111 standards. Using that authority, States can impose under state law additional mercury restrictions on EGUs should future measurements show that such action is necessary.

V. State Respondent-Intervenors North Dakota, South Dakota, Wyoming, and Nebraska Contend EPA's Mercury Allocation Methodology Is Reasonable.

Respondent-intervenor States of North Dakota, South Dakota, Wyoming, and Nebraska support the methodology EPA used to establish state mercury budgets under CAMR.[54] *See* 70 Fed. Reg. 28,622-30. As explained in EPA's brief, *see* EPA Br. at 160-68, EGUs utilizing the various coal ranks have different mercury removal efficiencies because of demonstrated differences in the forms of mercury produced during combustion. Based upon the substantial technical assessment contained in the rulemaking record, EPA's selected coal rank methodology rationally reflects those differences in removal efficiency as measured in pounds of mercury emitted per megawatt of power generated.

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[54] The remaining state and industrial respondent-intervenors take no position on EPA's allocation methodology.

CONCLUSION

For the reasons stated above, EPA's § 112(n) rule and CAMR should be affirmed.

Respectfully Submitted,

Milt E. Belcher /LBZ
Troy King, Attorney General
Milt E. Belcher, Assistant Attorney General
11 South Union Street
Montgomery, Alabama 36130-0152
(334) 242-7300

State of Alabama

Paul Seby /LBZ
Wayne Stenehjem, Attorney General
600 East Boulevard Avenue
Bismarck, ND 58505-2210
(701) 328-2210
Paul Seby, Special Assistant
Attorney General
McKenna, Long & Aldridge LLP
1875 Lawrence St., Suite 200
Denver, CO 80202
Lyle Witham, Assistant Attorney General

State of North Dakota

Thomas M. Fisher /LBZ
Steve Carter, Attorney General
Thomas M. Fisher, Solicitor General
302 West Washington Street
Indianapolis, IN 46204-2770
(317) 232-7979
tfisher@atg.state.in.us
vtachtiris@atg.state.in.us

State of Indiana

Jodi Fenner /LBZ
Jon C. Bruning, Attorney General
Jodi Fenner, Assistant Attorney General
2115 State Capitol
Lincoln, NE 68509-8920
(402) 471-2682
jfenner@notes.state.ne.us

State of Nebraska

Roxanne Giedd /LBZ
Lawrence E. Long, Attorney General
Roxanne Giedd, Dep. Attorney General
500 East Capitol Street
Pierre, SD 57501-5070
(605) 773-3215
Roxanne.giedd@state.sd.us

State of South Dakota

Nancy Vehr /LBZ
Patrick Crank, Attorney General
Nancy Vehr, Assistant Attorney General
123 Capitol Building
Cheyenne, WY 82002
(307) 777-6869
nvehr@state.wy.us

State of Wyoming

Mark J. Rudolph /LBZ
Mark J. Rudolph
Senior Counsel
Office of Legal Services
West Virginia Department of
Environmental Protection
601 57th Street SE
Charleston, WV 25304
(304) 926-0460

State of West Virginia, Department of Environmental Protection, Amicus

Lee B. Zeugin
Henry V. Nickel
F. William Brownell
Lee B. Zeugin
Hunton & Williams LLP
1900 K Street,
Washington, DC 20006
(202) 955-1500
lzeugin@hunton.com

For Utility Air Regulatory Group

Peter H. Wyckoff /LBZ
Peter H. Wyckoff
Pillsbury Winthrop Shaw Pittman LLP
2300 N Street, NW
Washington, DC 20037
(202) 663-8000

For Duke Energy Indiana, Inc., Duke Energy Kentucky, Inc., and Duke Energy Ohio, Inc.

William M. Bumpers /LBZ
William M. Bumpers
Debra J. Jezouit
Baker Botts, L.L.P.
1299 Pennsylvania Ave., NW
Washington, DC 20004-2400
(202) 639-7700
william.bumpers@bakerbotts.com

For PPL Corporation, PSEG Fossil LLC, NRG Inc., and Florida Power & Light Company

Henri D. Bartholomot /LBZ
Henri D. Bartholomot
Edison Electric Institute
701 Pennsylvania Avenue, NW
Washington, DC 20004
(202) 508-5000
HBartholomot@eei.org

For Edison Electric Institute

Peter Glaser /LBZ
Peter Glaser
Troutman and Sanders, LLP
401 9th St., NW, Suite 1000
Washington, DC 20004
(202) 274-2950
peterglaser@troutmansanders.com

For the National Mining Association

Dated: May 18, 2007
FINAL: July 23, 2007

CERTIFICATE OF COMPLIANCE WITH WORD LIMIT

I hereby certify, pursuant to Federal Rules of Appellate Procedure 32(a)(7)(C) and Circuit Rule 32(a)3(C), that the foregoing final Joint Brief of State Respondent-Intervenors, Industry Respondent-Intervenors, and State Amicus contains 8734 words, as counted by a word processing system that includes headings, footnotes, quotations, and citations in the count, and therefore is within the 8750 word limit established by this Court's Order dated November 29, 2006.

Lee B. Zeugin

Lee B. Zeugin

STATUTORY AND REGULATORY ADDENDUM

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STATUTORY AND REGULATORY ADDENDUM

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LEGISLATIVE HISTORY

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Pollutant	Units (7 percent oxygen, dry basis)	Emission limits		
		HMIWI size		
		Small	Medium	Large
Lead	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet) or percent reduction.	1.2 (0.52) or 70%	1.2 (0.52) or 70%	1.2 (0.52) or 70%.
Cadmium	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet) or percent reduction.	0.16 (0.07) or 65%	0.16 (0.07) or 65%..	
Mercury	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet) or percent reduction.	0.55 (0.24) or 85%	0.55 (0.24) or 85%	0.55 (0.24) or 85%.

TABLE 2 TO SUBPART CE—EMISSIONS LIMITS FOR SMALL HMIWI WHICH MEET THE CRITERIA UNDER § 60.33E(B)

Pollutant	Units (7 percent oxygen, dry basis)	HMIWI emission limits
Particulate matter	Milligrams per dry standard cubic meter (grains per dry standard cubic foot).	197 (0.086).
Carbon monoxide	Parts per million by volume	40.
Dioxins/furans	nanograms per dry standard cubic meter total dioxins/furans (grains per billion dry standard cubic feet) or nanograms per dry standard cubic meter TEQ (grains per billion dry standard cubic feet).	800 (350) or 15 (6.6).
Hydrogen chloride	Parts per million by volume	3100.
Sulfur dioxide	Parts per million by volume	55.
Nitrogen oxides	Parts per million by volume	250.
Lead	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet).	10 (4.4).
Cadmium	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet).	4 (1.7).
Mercury	Milligrams per dry standard cubic meter (grains per thousands dry standard cubic feet).	7.5 (3.3).

Subpart D—Standards of Performance for Fossil-Fuel-Fired Steam Generators for Which Construction is Commenced After August 17, 1971

§ 60.40 Applicability and designation of affected facility.

(a) The affected facilities to which the provisions of this subpart apply are:

(1) Each fossil-fuel-fired steam generating unit of more than 73 megawatts heat input rate (250 million Btu per hour).

(2) Each fossil-fuel and wood-residue-fired steam generating unit capable of firing fossil fuel at a heat input rate of more than 73 megawatts (250 million Btu per hour).

(b) Any change to an existing fossil-fuel-fired steam generating unit to accommodate the use of combustible materials, other than fossil fuels as defined in this subpart, shall not bring that unit under the applicability of this subpart.

(c) Except as provided in paragraph (d) of this section, any facility under paragraph (a) of this section that commenced construction or modification after August 17, 1971, is subject to the requirements of this subpart.

(d) The requirements of §§ 60.44 (a)(4), (a)(5), (b) and (d), and 60.45(f)(4)(vi) are applicable to lignite-fired steam generating units that commenced construction or modification after December 22, 1976.

(e) Any facility covered under subpart Da is not covered under this subpart.

[42 FR 37936, July 25, 1977, as amended at 43 FR 9278, Mar. 7, 1978; 44 FR 33612, June 17, 1979]

§ 60.41 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act, and in subpart A of this part.

(a) *Fossil-fuel fired steam generating unit* means a furnace or boiler used in the process of burning fossil fuel for the purpose of producing steam by heat transfer.

(b) *Fossil fuel* means natural gas, petroleum, coal, and any form of solid, liquid, or gaseous fuel derived from such materials for the purpose of creating useful heat.

(c) *Coal refuse* means waste-products of coal mining, cleaning, and coal preparation operations (e.g. culm, gob, etc.) containing coal, matrix material, clay, and other organic and inorganic material.

(d) *Fossil fuel and wood residue-fired steam generating unit* means a furnace or boiler used in the process of burning fossil fuel and wood residue for the purpose of producing steam by heat transfer.

(e) *Wood residue* means bark, sawdust, slabs, chips, shavings, mill trim, and other wood products derived from wood processing and forest management operations.

(f) *Coal* means all solid fuels classified as anthracite, bituminous, subbituminous, or lignite by ASTM D388–77, 90, 91, 95, or 98a (incorporated by reference—see §60.17).

[39 FR 20791, June 14, 1974, as amended at 40 FR 2803, Jan. 16, 1975; 41 FR 51398, Nov. 22, 1976; 43 FR 9278, Mar. 7, 1978; 48 FR 3736, Jan. 27, 1983; 65 FR 61752, Oct. 17, 2000]

§60.42 Standard for particulate matter.

(a) On and after the date on which the performance test required to be conducted by §60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which:

(1) Contain particulate matter in excess of 43 nanograms per joule heat input (0.10 lb per million Btu) derived from fossil fuel or fossil fuel and wood residue.

(2) Exhibit greater than 20 percent opacity except for one six-minute period per hour of not more than 27 percent opacity.

(b)(1) On or after December 28, 1979, no owner or operator shall cause to be discharged into the atmosphere from the Southwestern Public Service Company's Harrington Station #1, in Amarillo, TX, any gases which exhibit greater than 35 percent opacity, except that a maximum or 42 percent opacity shall be permitted for not more than 6 minutes in any hour.

(2) Interstate Power Company shall not cause to be discharged into the atmosphere from its Lansing Station Unit No. 4 in Lansing, IA, any gases which exhibit greater than 32 percent opacity, except that a maximum of 39 percent opacity shall be permitted for not more than six minutes in any hour.

[39 FR 20792, June 14, 1974, as amended at 41 FR 51398, Nov. 22, 1976; 42 FR 61537, Dec. 5, 1977; 44 FR 76787, Dec. 28, 1979; 45 FR 36077, May 29, 1980; 45 FR 47146, July 14, 1980; 46 FR 57498, Nov. 24, 1981; 61 FR 49976, Sept. 24, 1996; 65 FR 61752, Oct. 17, 2000]

§60.43 Standard for sulfur dioxide.

(a) On and after the date on which the performance test required to be conducted by §60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain sulfur dioxide in excess of:

(1) 340 nanograms per joule heat input (0.80 lb per million Btu) derived from liquid fossil fuel or liquid fossil fuel and wood residue.

(2) 520 nanograms per joule heat input (1.2 lb per million Btu) derived from solid fossil fuel or solid fossil fuel and wood residue, except as provided in paragraph (e) of this section.

(b) When different fossil fuels are burned simultaneously in any combination, the applicable standard (in ng/J) shall be determined by proration using the following formula:

$$PS_{SO2}=[y(340)+z(520)]/(y+z)$$

where:

PS_{SO2} is the prorated standard for sulfur dioxide when burning different fuels simultaneously, in nanograms per joule heat input derived from all fossil fuels fired or from all fossil fuels and wood residue fired,

y is the percentage of total heat input derived from liquid fossil fuel, and

z is the percentage of total heat input derived from solid fossil fuel.

(c) Compliance shall be based on the total heat input from all fossil fuels burned, including gaseous fuels.

(d) [Reserved]

(e) Units 1 and 2 (as defined in appendix G) at the Newton Power Station owned or operated by the Central Illinois Public Service Company will be in compliance with paragraph (a)(2) of this section if Unit 1 and Unit 2 individually comply with paragraph (a)(2) of this section or if the combined emission rate from Units 1 and 2 does not exceed 470 nanograms per joule (1.1 lb per million Btu) combined heat input to Units 1 and 2.

[39 FR 20792, June 14, 1974, as amended at 41 FR 51398, Nov. 22, 1976; 52 FR 28954, Aug. 4, 1987]

§ 60.44 Standard for nitrogen oxides.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain nitrogen oxides, expressed as NO_2 in excess of:

(1) 86 nanograms per joule heat input (0.20 lb per million Btu) derived from gaseous fossil fuel.

(2) 129 nanograms per joule heat input (0.30 lb per million Btu) derived from liquid fossil fuel, liquid fossil fuel and wood residue, or gaseous fossil fuel and wood residue.

(3) 300 nanograms per joule heat input (0.70 lb per million Btu) derived from solid fossil fuel or solid fossil fuel and wood residue (except lignite or a solid fossil fuel containing 25 percent, by weight, or more of coal refuse).

(4) 260 nanograms per joule heat input (0.60 lb per million Btu) derived from lignite or lignite and wood residue (except as provided under paragraph (a)(5) of this section).

(5) 340 nanograms per joule heat input (0.80 lb per million Btu) derived from lignite which is mined in North Dakota, South Dakota, or Montana and which is burned in a cyclone-fired unit.

(b) Except as provided under paragraphs (c) and (d) of this section, when different fossil fuels are burned simultaneously in any combination, the applicable standard (in ng/J) is determined by proration using the following formula:

$$PS_{NO_x} = \frac{w(260) + x(86) + y(130) + z(300)}{w + x + y + z}$$

where:

PS_{NO_x}=is the prorated standard for nitrogen oxides when burning different fuels simultaneously, in nanograms per joule heat input derived from all fossil fuels fired or from all fossil fuels and wood residue fired;

w= is the percentage of total heat input derived from lignite;

x= is the percentage of total heat input derived from gaseous fossil fuel;

y= is the percentage of total heat input derived from liquid fossil fuel; and

z= is the percentage of total heat input derived from solid fossil fuel (except lignite).

(c) When a fossil fuel containing at least 25 percent, by weight, of coal refuse is burned in combination with gaseous, liquid, or other solid fossil fuel or wood residue, the standard for nitrogen oxides does not apply.

(d) Cyclone-fired units which burn fuels containing at least 25 percent of lignite that is mined in North Dakota, South Dakota, or Montana remain subject to paragraph (a)(5) of this section regardless of the types of fuel combusted in combination with that lignite.

[39 FR 20792, June 14, 1974, as amended at 41 FR 51398, Nov. 22, 1976; 43 FR 9278, Mar. 7, 1978; 51 FR 42797, Nov. 25, 1986]

§ 60.45 Emission and fuel monitoring.

(a) Each owner or operator shall install, calibrate, maintain, and operate continuous monitoring systems for measuring the opacity of emissions, sulfur dioxide emissions, nitrogen oxides emissions, and either oxygen or carbon dioxide except as provided in paragraph (b) of this section.

(b) Certain of the continuous monitoring system requirements under paragraph (a) of this section do not apply to owners or operators under the following conditions:

(1) For a fossil fuel-fired steam generator that burns only gaseous fossil fuel, continuous monitoring systems for measuring the opacity of emissions and sulfur dioxide emissions are not required.

(2) For a fossil fuel-fired steam generator that does not use a flue gas desulfurization device, a continuous monitoring system for measuring sulfur dioxide emissions is not required if the owner or operator monitors sulfur dioxide emissions by fuel sampling and analysis.

(3) Notwithstanding §60.13(b), installation of a continuous monitoring system for nitrogen oxides may be delayed until after the initial performance tests under §60.8 have been conducted. If the owner or operator demonstrates during the performance test that emissions of nitrogen oxides are less than 70 percent of the applicable standards in §60.44, a continuous monitoring system for measuring nitrogen oxides emissions is not required. If the initial performance test results show that nitrogen oxide emissions are greater than 70 percent of the applicable standard, the owner or operator shall install a continuous monitoring system for nitrogen oxides within one year after the date of the initial performance tests under §60.8 and comply with all other applicable monitoring requirements under this part.

(4) If an owner or operator does not install any continuous monitoring systems for sulfur oxides and nitrogen oxides, as provided under paragraphs (b)(1) and (b)(3) or paragraphs (b)(2) and (b)(3) of this section a continuous monitoring system for measuring either oxygen or carbon dioxide is not required.

(c) For performance evaluations under §60.13(c) and calibration checks under §60.13(d), the following procedures shall be used:

(1) Methods 6, 7, and 3B, as applicable, shall be used for the performance evaluations of sulfur dioxide and nitrogen oxides continuous monitoring systems. Acceptable alternative methods for Methods 6, 7, and 3B are given in §60.46(d).

(2) Sulfur dioxide or nitric oxide, as applicable, shall be used for preparing calibration gas mixtures under Performance Specification 2 of appendix B to this part.

(3) For affected facilities burning fossil fuel(s), the span value for a continuous monitoring system measuring the opacity of emissions shall be 80, 90, or 100 percent and for a continuous monitoring system measuring sulfur oxides or nitrogen oxides the span value shall be determined as follows:

[In parts per million]

Fossil fuel	Span value for sulfur dioxide	Span value for nitrogen oxides
Gas	(1)	500
Liquid	1,000	500
Solid	1,500	1000
Combinations	$1,000y+1,500z$	$500(x+y)+1,000z$

[1] Not applicable.

where:

x=the fraction of total heat input derived from gaseous fossil fuel, and

y=the fraction of total heat input derived from liquid fossil fuel, and

z=the fraction of total heat input derived from solid fossil fuel.

(4) All span values computed under paragraph (c)(3) of this section for burning combinations of fossil fuels shall be rounded to the nearest 500 ppm.

(5) For a fossil fuel-fired steam generator that simultaneously burns fossil fuel and nonfossil fuel, the span value of all continuous monitoring systems shall be subject to the Administrator's approval.

(d) [Reserved]

(e) For any continuous monitoring system installed under paragraph (a) of this section, the following conversion procedures shall be used to convert the continuous monitoring data into units of the applicable standards (ng/J, lb/million Btu):

(1) When a continuous monitoring system for measuring oxygen is selected, the measurement of the pollutant concentration and oxygen concentration shall each be on a consistent basis (wet or dry). Alternative procedures approved by the Administrator shall be used when measurements are on a wet basis. When measurements are on a dry basis, the following conversion procedure shall be used:

$$E=CF[20.9/(20.9\text{—percent } O_2)]$$

where:

E, C, F, and $\%O_2$ are determined under paragraph (f) of this section.

(2) When a continuous monitoring system for measuring carbon dioxide is selected, the measurement of the pollutant concentration and carbon dioxide concentration shall each be on a consistent basis (wet or dry) and the following conversion procedure shall be used:

$$E=CF_c\ [100/\text{percent } CO_2]$$

where:

E, C, F_c and $\%CO_2$ are determined under paragraph (f) of this section.

(f) The values used in the equations under paragraphs (e) (1) and (2) of this section are derived as follows:

(1) E=pollutant emissions, ng/J (lb/million Btu).

(2) C=pollutant concentration, ng/dscm (lb/dscf), determined by multiplying the average concentration (ppm) for each one-hour period by 4.15×10^4 M ng/dscm per ppm (2.59×10^{-9} M lb/dscf per ppm) where M=pollutant molecular weight, g/g-mole (lb/lb-mole). M=64.07 for sulfur dioxide and 46.01 for nitrogen oxides.

(3) $\%O_2$, $\%CO_2$=oxygen or carbon dioxide volume (expressed as percent), determined with equipment specified under paragraph (a) of this section.

(4) F, F_c=a factor representing a ratio of the volume of dry flue gases generated to the calorific value of the fuel combusted (F), and a factor representing a ratio of the volume of carbon dioxide generated to the calorific value of the fuel combusted (F_c), respectively. Values of F and F_c are given as follows:

(i) For anthracite coal as classified according to ASTM D388–77, 90, 91, 95, or 98a (incorporated by reference—see § 60.17), F=$2,723\times10^{-17}$ dscm/J (10,140 dscf/million Btu and F_c=0.532×10^{-17} scm CO_2/J (1,980 scf CO_2/million Btu).

(ii) For subbituminous and bituminous coal as classified according to ASTM D388–77, 90, 91, 95, or 98a (incorporated by reference—see § 60.17), F=2.637×10^{-7} dscm/J (9,820 dscf/million Btu) and F_c=0.486×10^{-7} scm CO_2/J (1,810 scf CO_2/million Btu).

(iii) For liquid fossil fuels including crude, residual, and distillate oils, F=2.476×10^{-7} dscm/J (9,220 dscf/million Btu) and F_c=0.384×10^{-7} scm CO_2/J (1,430 scf CO_2/million Btu).

(iv) For gaseous fossil fuels, F=2.347×10^{-7} dscm/J (8,740 dscf/million Btu). For natural gas, propane, and butane fuels, F_c=0.279×10^{-7} scm CO_2/J (1,040 scf CO_2/million Btu) for natural gas, 0.322×10^{-7} scm CO_2/J (1,200 scf CO_2/million Btu) for propane, and 0.338×10^{-7} scm CO_2/J (1,260 scf CO_2/million Btu) for butane.

(v) For bark F=2.589×10^{-7} dscm/J (9,640 dscf/million Btu) and F_c=0.500×10^{-7} scm CO_2/J (1,840 scf CO_2/ million Btu). For wood residue other than bark F=2.492×10^{-7} dscm/J (9,280 dscf/million Btu) and F_c=0.494×10^{-7} scm CO_2/J (1,860 scf CO_2/ million Btu).

(vi) For lignite coal as classified according to ASTM D388–77, 90, 91, 95, or 98a (incorporated by reference—see § 60.17), F=2.659×10^{-7} dscm/J (9,900 dscf/million Btu) and F_c=0.516×10^{-7} scm CO_2/J (1,920 scf CO_2/million Btu).

(5) The owner or operator may use the following equation to determine an F factor (dscm/J or dscf/million Btu) on a dry basis (if it is desired to calculate F on a wet basis, consult the Administrator) or F_c factor (scm CO_2/J, or scf CO_2/million Btu) on either basis in lieu of the F or F_c factors specified in paragraph (f)(4) of this section:

$$F = 10^{-6}\frac{[227.2\,(\text{pct. II}) + 95.5\,(\text{pct. C}) + 35.6\,(\text{pct. S}) + 8.7\,(\text{pct. N}) - 28.7\,(\text{pct. O})]}{\text{GCV}}$$

$$F_c = \frac{2.0 \times 10^{-5}\,(\text{pct. C})}{\text{GCV}(\text{SI units})}$$

$$F = \frac{10^{6}[3.64(\%H) + 1.53(\%C) + 0.57(\%S) + 0.14(\%N) - 0.46(\%O)]}{GCV\,(\text{English units})}$$

$$F_c = \frac{20.0(\%C)}{GCV\,(\text{SI units})}$$

$$F_c = \frac{321 \times 10^{3}(\%C)}{GCV(\text{English units})}$$

(i) H, C, S, N, and O are content by weight of hydrogen, carbon, sulfur, nitrogen, and oxygen (expressed as percent), respectively, as determined on the same basis as GCV by ultimate analysis of the fuel fired, using ASTM D3178–73 (Reapproved 1979), 89, or D3176–74 or 89 (solid fuels) or computed from results using ASTM D1137–53 or 75, D1945–64, 76, 91, or 96 or D1946–77 or 90 (Reapproved 1994) (gaseous fuels) as applicable. (These five methods are incorporated by reference—see § 60.17.)

(ii) GVC is the gross calorific value (kJ/kg, Btu/lb) of the fuel combusted determined by the ASTM test methods D2015–77 for solid fuels and D1826–77 for gaseous fuels as applicable. (These two methods are incorporated by reference—see § 60.17.)

(iii) For affected facilities which fire both fossil fuels and nonfossil fuels, the F or F_c value shall be subject to the Administrator's approval.

(6) For affected facilities firing combinations of fossil fuels or fossil fuels and wood residue, the F or F_c factors determined by paragraphs (f)(4) or (f)(5) of this section shall be prorated in accordance with the applicable formula as follows:

$$F = \sum_{i=1}^{n} X_i F_i \text{ or } F_c = \sum_{i=1}^{n} X_i (F_c)_i$$

where:

X_i=the fraction of total heat input derived from each type of fuel (e.g. natural gas, bituminous coal, wood residue, etc.)

F_i or $(F_c)_i$=the applicable F or F_c factor for each fuel type determined in accordance with paragraphs (f)(4) and (f)(5) of this section.

n=the number of fuels being burned in combination.

(g) Excess emission and monitoring system performance reports shall be submitted to the Administrator semiannually for each six-month period in the calendar year. All semiannual reports shall be postmarked by the 30th day following the end of each six-month period. Each excess emission and MSP report shall include the information required in § 60.7(c). Periods of excess emissions and monitoring systems (MS) downtime that shall be reported are defined as follows:

(1) *Opacity.* Excess emissions are defined as any six-minute period during which the average opacity of emissions exceeds 20 percent opacity, except that one six-minute average per hour of up to 27 percent opacity need not be reported.

(i) For sources subject to the opacity standard of § 60.42(b)(1), excess emissions are defined as any six-minute period during which the average opacity of emissions exceeds 35 percent opacity, except that one six-minute average per hour of up to 42 percent opacity need not be reported.

(ii) For sources subject to the opacity standard of § 60.42(b)(2), excess emissions are defined as any six-minute period during which the average opacity of emissions exceeds 32 percent opacity, except that one six-minute average per hour of up to 39 percent opacity need not be reported.

(2) *Sulfur dioxide.* Excess emissions for affected facilities are defined as:

(i) Any three-hour period during which the average emissions (arithmetic average of three contiguous one-hour periods) of sulfur dioxide as measured by a continuous monitoring system exceed the applicable standard under § 60.43.

(3) *Nitrogen oxides.* Excess emissions for affected facilities using a continuous monitoring system for measuring nitrogen oxides are defined as any three-hour period during which the average emissions (arithmetic average of three contiguous one-hour periods) exceed the applicable standards under § 60.44.

[40 FR 46256, Oct. 6, 1975]

EDITORIAL NOTES: 1. For FEDERAL REGISTER citations affecting § 60.45, see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and on GPO Access.

2. At 65 FR 61752, Oct. 17, 2000, § 60.45(f)(5)(ii) was amended by revising the words "ASTM D1826–77" to read "ASTM D1826–77 or 94." and by revising the words "ASTM D2015–77" to read "ASTM D2015–77 (Reapproved 1978), 96, or D5865–98." However, this amendment could not be incorporated because these words do not exist in paragraph (f)(5)(ii).

§ 60.46 Test methods and procedures.

(a) In conducting the performance tests required in § 60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided in § 60.8(b). Acceptable alternative methods and procedures are given in paragraph (d) of this section.

(b) The owner or operator shall determine compliance with the particulate matter, SO_2, and NO_X standards in §§ 60.42, 60.43, and 60.44 as follows:

(1) The emission rate (E) of particulate matter, SO_2, or NO_X shall be computed for each run using the following equation:

$$E=C\ F_d\ (20.9)/(20.9-\%\ O_2)$$

E = emission rate of pollutant, ng/J (lb/million Btu).

C = concentration of pollutant, ng/dscm (lb/dscf).

$\%O_2$ = oxygen concentration, percent dry basis.

F_d = factor as determined from Method 19.

(2) Method 5 shall be used to determine the particular matter concentration (C) at affected facilities without wet flue-gas-desulfurization (FGD) systems and Method 5B shall be used to determine the particulate matter concentration (C) after FGD systems.

(i) The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf). The probe and filter holder heating systems in the sampling train shall be set to provide an average gas temperature of 160 ±14 °C (320 ±25 °F).

(ii) The emission rate correction factor, integrated or grab sampling and analysis procedure of Method 3B shall be used to determine the O_2 concentration ($\%O_2$). The O_2 sample shall be obtained simultaneously with, and at the same traverse points as, the particulate sample. If the grab sampling procedure is used, the O_2 concentration for the run shall be the arithmetic mean of the sample O_2 concentrations at all traverse points.

(iii) If the particulate run has more than 12 traverse points, the O_2 traverse points may be reduced to 12 provided that Method 1 is used to locate the 12 O_2 traverse points.

(3) Method 9 and the procedures in § 60.11 shall be used to determine opacity.

(4) Method 6 shall be used to determine the SO_2 concentration.

(i) The sampling site shall be the same as that selected for the particulate sample. The sampling location in the duct shall be at the centroid of the cross section or at a point no closer to the walls than 1 m (3.28 ft). The sampling time and sample volume for each sample run shall be at least 20 minutes and 0.020 dscm (0.71 dscf). Two samples shall be taken during a 1-hour period, with each sample taken within a 30-minute interval.

(ii) The emission rate correction factor, integrated sampling and analysis procedure of Method 3B shall be used to determine the O_2 concentration ($\%O_2$). The O_2 sample shall be taken simultaneously with, and at the same point as, the SO_2 sample. The SO_2 emission rate shall be computed for each pair of SO_2 and O_2 samples. The SO_2 emission rate (E) for each run shall be the arithmetic mean of the results of the two pairs of samples.

(5) Method 7 shall be used to determine the NO_X concentration.

(i) The sampling site and location shall be the same as for the SO_2 sample. Each run shall consist of four grab samples, with each sample taken at about 15-minute intervals.

(ii) For each NO_X sample, the emission rate correction factor, grab sampling and analysis procedure of Method 3B shall be used to determine the O_2 concentration ($\%O_2$). The sample shall be taken simultaneously with, and at the same point as, the NO_X sample.

(iii) The NO_X emission rate shall be computed for each pair of NO_X and O_2 samples. The NO_X emission rate (E) for each run shall be the arithmetic mean of the results of the four pairs of samples.

(c) When combinations of fossil fuels or fossil fuel and wood residue are fired, the owner or operator (in order to compute the prorated standard as shown in §§60.43(b) and 60.44(b)) shall determine the percentage (w, x, y, or z) of the total heat input derived from each type of fuel as follows:

(1) The heat input rate of each fuel shall be determined by multiplying the gross calorific value of each fuel fired by the rate of each fuel burned.

(2) ASTM Methods D2015–77 (Reapproved 1978), 96, or D5865–98 (solid fuels), D240–76 or 92 (liquid fuels), or D1826–77 or 94 (gaseous fuels) (incorporated by reference—see §60.17) shall be used to determine the gross calorific values of the fuels. The method used to determine the calorific value of wood residue must be approved by the Administrator.

(3) Suitable methods shall be used to determine the rate of each fuel burned during each test period, and a material balance over the steam generating system shall be used to confirm the rate.

(d) The owner or operator may use the following as alternatives to the reference methods and procedures in this section or in other sections as specified:

(1) The emission rate (E) of particulate matter, SO_2 and NO_X may be determined by using the F_c factor, provided that the following procedure is used:

(i) The emission rate (E) shall be computed using the following equation:

$$E = C\ F_c\ (100/\%CO_2)$$

where:

E=emission rate of pollutant, ng/J (lb/million Btu).

C=concentration of pollutant, ng/dscm (lb/dscf).

$\%CO_2$=carbon dioxide concentration, percent dry basis.

F_c=factor as determined in appropriate sections of Method 19.

(ii) If and only if the average F_c factor in Method 19 is used to calculate E and either E is from 0.97 to 1.00 of the emission standard or the relative accuracy of a continuous emission monitoring system is from 17 to 20 percent, then three runs of Method 3B shall be used to determine the O_2 and CO_2 concentration according to the procedures in paragraph (b) (2)(ii), (4)(ii), or (5)(ii) of this section. Then if F_o (average of three runs), as calculated from the equation in Method 3B, is more than ±3 percent than the average F_o value, as determined from the average values of F_d and F_c in Method 19, i.e., $F_{oa}=0.209\ (F_{da}/F_{ca})$, then the following procedure shall be followed:

(A) When F_o is less than 0.97 F_{oa}, then E shall be increased by that proportion under 0.97 F_{oa}, e.g., if F_o is 0.95 F_{oa}, E shall be increased by 2 percent. This recalculated value shall be used to determine compliance with the emission standard.

(B) When F_o is less than 0.97 F_{oa} and when the average difference ($\bar{d}$) between the continuous monitor minus the reference methods is negative, then E shall be increased by that proportion under 0.97 F_{oa}, e.g., if F_o is 0.95 F_{oa}, E shall be increased by 2 percent. This recalculated value shall be used to determine compliance with the relative accuracy specification.

(C) When F_o is greater than 1.03 F_{oa} and when the average difference $\bar{d}$ is positive, then E shall be decreased by that proportion over 1.03 F_{oa}, e.g., if F_o is 1.05 F_{oa}, E shall be decreased by 2 percent. This recalculated value shall be used to determine compliance with the relative accuracy specification.

(2) For Method 5 or 5B, Method 17 may be used at facilities with or without wet FGD systems if the stack gas temperature at the sampling location does not exceed an average temperature of 160 °C (320 °F). The procedures of sections 2.1 and 2.3 of Method 5B may be used with Method 17 only if it is used after wet FGD systems. Method 17 shall not be used after wet FGD systems if the effluent gas is saturated or laden with water droplets.

(3) Particulate matter and SO_2 may be determined simultaneously with the Method 5 train provided that the following changes are made:

(i) The filter and impinger apparatus in sections 2.1.5 and 2.1.6 of Method 8 is used in place of the condenser (section 2.1.7) of Method 5.

(ii) All applicable procedures in Method 8 for the determination of SO_2 (including moisture) are used:

(4) For Method 6, Method 6C may be used. Method 6A may also be used whenever Methods 6 and 3B data are specified to determine the SO_2 emission rate, under the conditions in paragraph (d)(1) of this section.

(5) For Method 7, Method 7A, 7C, 7D, or 7E may be used. If Method 7C, 7D, or 7E is used, the sampling time for each run shall be at least 1 hour and the integrated sampling approach shall be used to determine the O_2 concentration ($\%O_2$) for the emission rate correction factor.

(6) For Method 3, Method 3A or 3B may be used.

(7) For Method 3B, Method 3A may be used.

[54 FR 6662, Feb. 14, 1989; 54 FR 21344, May 17, 1989, as amended at 55 FR 5212, Feb. 14, 1990; 65 FR 61752, Oct. 17, 2000]

Subpart Da—Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978

SOURCE: 44 FR 33613, June 11, 1979, unless otherwise noted.

§ 60.40Da Applicability and designation of affected facility.

(a) The affected facility to which this subpart applies is each electric utility steam generating unit:

(1) That is capable of combusting more than 73 megawatts (250 million Btu/hour) heat input of fossil fuel (either alone or in combination with any other fuel); and

(2) For which construction, modification, or reconstruction is commenced after September 18, 1978.

(b) Heat recovery steam generators that are associated with stationary combustion turbines burning fuels other than 75 percent (by heat input) or more synthetic-coal gas on a 12-month rolling average and that meet the applicability requirements of subpart KKKK of this part are not subject to this subpart. Heat recovery steam generators and the associated stationary combustion turbine(s) burning fuels containing 75 percent (by heat input) or more synthetic-coal gas on a 12-month rolling average are subject to this part and are not subject to subpart KKKK of this part. This subpart will continue to apply to all other electric utility combined cycle gas turbines that are capable of combusting more than 73 MW (250 MMBtu/h) heat input of fossil fuel in the heat recovery steam generator. If the heat recovery steam generator is subject to this subpart and the combined cycle gas turbine burn fuels other than synthetic-coal gas, only emissions resulting from combustion of fuels in the steam-generating unit are subject to this subpart. (The combustion turbine emissions are subject to subpart GG or KKKK, as applicable, of this part).

(c) Any change to an existing fossil-fuel-fired steam generating unit to accommodate the use of combustible materials, other than fossil fuels, shall not bring that unit under the applicability of this subpart.

(d) Any change to an existing steam generating unit originally designed to fire gaseous or liquid fossil fuels, to accommodate the use of any other fuel (fossil or nonfossil) shall not bring that

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federal register

TUESDAY, OCTOBER 14, 1975

THE NATIONAL ARCHIVES OF THE UNITED STATES 1934

PART V:

ENVIRONMENTAL PROTECTION AGENCY

■

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

Asbestos and Mercury

Title 40—Protection of Environment

CHAPTER I—ENVIRONMENTAL PROTECTION AGENCY

[FRL 431-2]

PART 61—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

Amendments to Standards for Asbestos and Mercury

On October 25, 1974 (39 FR 38064), pursuant to section 112 of the Clean Air Act, as amended, the Administrator proposed amendments to national emission standards for the hazardous air pollutants asbestos and mercury. The Administrator also proposed amendments to Appendix B, Test Methods, of this part.

Interested persons representing industry, trade associations, environmental groups, and Federal, State and local governments participated in the rulemaking by sending comments to the Agency. Commentators submitted 40 letters, many with multiple comments. The comments have been considered, and the proposed amendments have been reevaluated. Each comment, some of which were submitted by more than one party, has been separately addressed in writing by the Agency. The Freedom of Information Center, Room 202 West Tower, 401 M Street, SW, Washington, D.C. has copies of the comment letters received and a summary of the issues and Agency responses available for public inspection. In addition, copies of the issue summary and Agency responses may be obtained upon written request from the EPA Public Information Center (PM-215), 401 M Street, S.W., Washington, D.C. 20460 (specify Public Comment Summary—Proposed Amendments to National Emission Standards for Hazardous Air Pollutants—Asbestos and Mercury). Where determined by the Administrator to be appropriate, changes have been made to the proposed amendments, and the revised version of the amendments to the national emission standards for asbestos and mercury is promulgated herein. The principal changes to the proposed amendments and the Agency's responses to the major comments received are summarized below.

Copies of *Background Information on National Emission Standards for Hazardous Air Pollutants—Proposed Amendments to Standards for Asbestos and Mercury* (EPA-450/2-74-009a) which explains the basis for the proposed amendments are available on request from the Emission Standards and Engineering Division, Research Triangle Park, North Carolina 27711, Attention: Mr. Don R. Goodwin.

ASBESTOS

CHANGES TO PROPOSED AMENDMENTS

Manufacturing. The Agency received numerous comments stating that the proposed amendments should apply only to asphalt concrete manufacturing plants that use asbestos. This was the Agency's intent. Section 61.22(c) has been revised by the addition of the wording, "that use commercial asbestos."

Demolition and Renovation. A comment was received during review of the amendments within the Agency that ducts can be insulated with amounts of friable asbestos material similar to those on boilers, tanks, reactors, turbines, furnaces and structural members, and should be covered by the demolition and renovation regulations. Since demolition and renovation operations can involve ducts insulated with appreciable quantities of friable asbestos material, "ducts" has been added to the list of apparatus that are covered by the amendments.

The comment was made that the quantity of friable asbestos material proposed as the minimum amount for establishing renovation operations as major sources of asbestos subject to the proposed amendments was arbitrary, but should also apply to demolition operations. The Agency explained in the preamble to the proposed amendments that this amount of asbestos is typically contained in a four-unit apartment building, which is the maximum size for apartment buildings excluded from the demolition provisions. Therefore, the minimum quantity of friable asbestos material covered by the demolition and renovation provisions is essentially equivalent. The Agency considered applying regulations only to demolition operations in which more than a specified amount of friable asbestos material was involved, prior to promulgation of demolition provisions on April 6, 1973 (38 FR 8820). This approach was rejected primarily because it would complicate enforcement procedures. However, the Agency realizes that certain commercial buildings contain smaller amounts of friable asbestos material than the lower size cutoff limit proposed for renovating operations. On reevaluation, the Agency concluded that the available information justifies changing the proposed amendment to allow exemption of demolition operations involving less than 80 meters of friable asbestos pipe insulation and less than 15 square meters of friable asbestos material used to insulate or fireproof any duct, boiler, tank, reactor, turbine, furnace or structural member. The owner or operator of a demolition operation desiring this exemption must notify the Administrator, at least 20 days prior to beginning demolition, of the measured or estimated amount of friable asbestos material involved in the demolition. This will permit the exception to be implemented without requiring prior inspection of every site by Agency personnel, which would be an excessive enforcement burden. This differs from the reporting requirements of the renovation provisions of the amendments. The nature of renovation operations necessitates a greater familiarity on the part of the operator with the quantities of friable asbestos materials present than for demolition operations. For this reason, the Agency believes that it is not necessary to require reports from all renovation operations in order to ensure effective enforcement of the renovation provisions that apply to only larger renovation operations.

Several comments were received which stated that operating machinery could be damaged by wetting procedures during certain renovation operations. The wetting during renovation of a heated boiler, near sensitive electric equipment, and over operating machinery in an industrial plant were mentioned as specific examples. One comment also stated that portable local exhaust ventilation systems are effective alternatives to wetting. The proposed amendments have been changed to allow the use of local exhaust ventilation systems when damage to equipment from wetting is unavoidable, provided that the system captures the asbestos particulate material produced during the removal of friable asbestos material and discharges no visible emissions from its exhaust. The Administrator will make determinations, upon request, of whether damage to equipment from wetting would be unavoidable.

Several comments were received which stated that the proposed frequency for submitting to the Agency written notices of intention to perform repetitive renovation work at a single facility was excessive. One commentator suggested that definitions for "emergency renovation" and "routine maintenance renovation" be included, and that a yearly filing of intention to renovate should be allowed for each industrial plant. It is evident from the comments received that some plants perform renovation operations very frequently, such as twice a week. The proposed reporting requirements for such plants would be excessive. The proposed amendment has been changed so that these requirements are reduced, and the applicability of the requirement is more clearly defined by adding more detailed language and definitions for "planned renovation" and "emergency renovation" operations. Additionally, the applicability of the amendment has been clarified by specifying how the quantities of asbestos involved in "planned renovation" and "emergency renovation" are to be determined. The basic characteristic that distinguishes the two types of renovation operations is the degree of predictability of their occurrence. The amount of friable asbestos material that will be removed or stripped within a given period of time can be predicted for planned renovation operations, including both scheduled and non-scheduled operations, whereas no such prediction can be made for emergency renovation operations. The given period of time for predicting purposes has been specified to be between 30 days and one year for planned renovation operations involving individually non-scheduled operations. A reporting time shorter than 30 days would require the submission and review of a large number of reports, and predictions over periods longer than one year could give inaccurate predictions of friable asbestos material to be removed. In emergency renovation operations, the amount of friable asbestos material that is subject to the amendment is the total amount of such material that will be removed or stripped as a result of the individual emergency.

One commentator stated that the proposed amendment covering renovation could be circumvented by the carrying out of small portions, which are individually not subject to the amendment, of a larger operation. Section 61.17 has been added to the General Provisions to explicitly prevent this potential circumvention and to apply in general to circumvention of all standards promulgated under this part.

One commentator stated that a requirement in § 61.22(d) (2) (vi) of the proposed amendments was inconsistent and should be revised. This section required that friable asbestos material removed from buildings greater than 50 feet in height be transported to the ground via dust-tight chutes or containers. The cited inconsistency arises because this requirement applied at all heights, including those less than 50 feet, for a building 50 feet or gretaer in height, whereas it did not apply to buildings less than 50 feet in height. The requirement has been changed so that it applies only to materials that have been removed or stripped at more than 50 feet above ground level.

Several minor changes have been made in response to comments. Language has been added to allow delivery of notices of intention to renovate or demolish to the Administrator by means other than the U.S. mail. There is a minor clarifying language change between § 61.22(d) (2) (i) of the proposed demolition provisions and the corresponding provision, § 61.22 (d) (4) (i), of the regulations promulgated herein. A comment suggested the term "adequately wetted" should be defined and differentiated from "thoroughly wetted," since both terms appeared in the proposed amendments. The use of these terms has been reevaluated, and a definition of "adequately wetted" has been added. The term "thoroughly wetted" has been deleted and the term "adequately wetted" has been used throughout.

The Agency has made a revision in the proposed requirement [§ 61.22(d) (1)] for notification of intention to perform renovation or demolition operations. An additional reporting requirement for the name and location of the waste disposal site where demolition and renovation waste will be deposited has been added to assist in enforcing the waste disposal provisions of the amendments.

Spraying. During review of the amendments within the Agency, a question arose concerning whether the waste generated by operations that use spray-on materials which contain less than one percent of asbestos by weight to insulate or fireproof buildings, structures, pipes and conduits was covered by the asbestos waste disposal amendment [§ 61.22(j)]. The spraying provisions do not apply to such operations, though reports of the operations were required by the standard promulgated on April 6, 1973. Therefore, the waste disposal processes associated with these operations are not regulated by the waste disposal amendments. Based on Agency enforcement experience since promulgation of the standard on April 6, 1973, the required reporting of spraying operations where less than 1 percent asbestos material is used is felt to be unnecessary. Accordingly, the Agency has revised the reporting requirements of paragraph 61.22(e) to apply only to spray-on insulation and fireproofing material that contains more than one percent asbestos by weight.

Waste Disposal. The proposed amendments would have applied directly to all waste disposal sites that accept asbestos waste from any emission source covered under the asbestos standard. The Agency estimated that approximately 2500 disposal sites would be covered. Review of these proposed amendments within the Agency indicated that enforcement would have required a disproportionate commitment of Agency resources. Alternative means of controlling asbestos emissions from waste disposal sites were therefore examined.

The number of acceptable waste disposal sites that meet the criteria in § 61.-22(j) (3) of the proposed amendments, which are similar to the criteria for sanitary landfills, has increased significantly within the past several years and the trend is continuing in that direction. This trend is noted in a recent publication ("Waste Age," January 1975). This indicates that acceptable sites (i.e., private and municipal sanitary landfills) which follow practices that reduce asbestos emissions will be available for disposal of asbestos-containing waste. Therefore, it was determined that an effective means of reducing emissions from waste disposal sites without undue enforcement burdens would be to require already-regulated asbestos waste generators to dispose of asbestos-containing wastes at properly operated disposal sites. This is provided for in the amendments herein promulgated.

The Agency's greatest concern is with disposal sites which accept large quantities of asbestos waste. In most cases, companies which generate large quantities of asbestos-containing waste also own and operate their own disposal sites because of convenience and economics. For example, all domestic asbestos mills operate their own tailings disposal sites. The Agency anticipates that these large waste generators will operate their disposal sites in the future in compliance with the proposed §.61.22(l) in order to meet the requirement that they dispose of their waste at a acceptable sites.

Inactive disposal sites may also be major emission sources if they contain large amounts of asbestos waste. It is likely that at inactive sites containing small amounts of asbestos waste the asbestos is covered by non-asbestos waste, and the chance of significant asbestos emissions is small. It was decided to require that those inactive sites which are known to contain large quantities of asbestos comply with the standards specified in section 61.22(1) to reduce asbestos emissions. This category of asbestos waste disposal sites is usually operated by the sources that generate the asbestos-containing wastes, as noted above. Accordingly, the amendments promulgated herein apply to inactive disposal sites that have previously been operated by certain sources covered by the asbestos standard. The owner of such an inactivated site must comply with the amendments regardless of whether or not he generated the waste or operated the disposal site when it was active. This category of sites includes asbestos mill tailings disposal sites, and the large disposal sites at asbestos manufacturing and fabricating plants which have caused concern in the past. The owners or operators of spraying, demolition and renovation operations have not operated disposal sites in the past and are not expected to do so in the future. Due to the nature of such operations, the wastes generated are deposited at waste disposal sites which accept mostly non-asbestos-containing waste. As a result, the asbestos waste is effectively covered, thereby preventing emissions even in open dumps. For these reasons, inactive waste disposal sites that have been used by spraying, renovation and demolition are not regulated.

The amendments promulgated herein will control inactive asbestos waste disposal sites that contain large quantities of asbestos waste. The Agency's enforcement resources will be more effectively utilized since approximately 2000 waste disposal sites will not be directly regulated by the promulgated amendments. This should facilitate enforcement and protection of the public health.

The comment was made that the proposed permanent posting of warning signs at inactive asbestos waste disposal sites would be overly restrictive. The warning signs were intended primarily to warn the general public of the potential hazards that could result from creating dust by such disturbances as walking on exposed asbestos waste. If the disposal site is properly covered over as required by the alternative methods of complying with the proposed amendment for waste disposal sites, such minor disturbances will not generate asbestos emissions. Accordingly, the proposed amendment has been changed, and warning signs are not required if an inactive disposal site applies and properly maintains a covering of compacted non-asbestos-containing material at least 60 centimeters (ca. 2 feet) in depth, or at least 15 centimeters (ca. 6 inches) in depth with a cover of vegetation. The proposed amendment would have also required that active asbestos waste disposal sites post warning signs. The amendments promulgated herein do not apply directly to active disposal sites, and the specified operating practices for acceptable disposal sites do not require the posting of warning signs provided an appropriate cover of at least 15 centimeters (ca. 6 inches) of non-asbestos-containing material is applied to the active portion of the site at the end of each operating day. Comments were received that suggested the Agency should allow the use of existing natural barriers as substitutes for fences that are intended to deter access to some types of asbestos waste disposal sites. The Agency agrees that certain natural barriers, such as deep ravines and steep cliffs, can be as effective as fences in deterring access. The proposed amendment has been changed to suspend the requirements for fences, and also warning signs, when a natural barrier provides an adequate deterrent to public access. Upon request and supply of appropriate information, the Administrator will determine whether a specific type of fence or a natural barrier adequately deters access to the general public. In response to another comment, the proposed amendment for fencing of asbestos waste disposal sites has been revised to allow fences to be placed either along the property line of an affected source that contains a waste disposal site or along the perimeter of the disposal site itself. Either type of fence provides the necessary deterrent to public access to the disposal site.

Several comments were received on the proposed prohibition of incineration of containers that previously contained commercial asbestos. One commentator stated that the prohibition seemed undesirable because asbestos is thermally degraded at a temperature of 600° C. The Agency considered: (a) the uncertainty that the feed material to an incinerator will be uniformly heated to the combustion chamber temperature, (b) the uncertainty concerning the decomposition temperature of asbestos, and (c) the results of a stack gas test that detected emissions of asbestos from a sintering process in which the temperature attained was well above 600° C, in evaluating the comment. The Agency concluded that the available data do not justify changing the proposed regulation on grounds that the asbestos is thermally degraded in the combustion process. Another comment suggested that incineration should be permitted, provided there are no visible emissions of asbestos particulate matter from the incinerator. Information presented to the Agency after proposal indicated that some small incinerators, such as those operated by asbestos manufacturing plants, can be operated with no visible emissions. The proposed prohibition on incineration of containers that previously held commercial asbestos has been deleted. The provisions of the amendments for the disposal of asbestos-containing waste materials apply in particular to the disposal of containers that previously held commercial asbestos. Therefore, these containers can be incinerated under the amendments, provided the incineration operation does not discharge visible emissions.

Two commentators suggested that the proposed amendments should not require that EPA warning labels be attached to containers of asbestos waste in addition to the warning labels specified in regulations issued by the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA). The Agency agrees that both labels adequately convey the desired information; therefore, the proposed amendment has been changed to allow the OSHA warning label to be used in place of the EPA warning label.

Several commentators requested that the proposed alternative method of compliance included in the asbestos waste disposal amendments, which specified that the waste be formed into non-friable pellets, be changed to accommodate shapes other than pellets. The precise size and shape of the processed, non-friable waste is not important, and the amendment has been reworded to explicitly permit the forming of asbestos wastes into pellets or any other shapes.

A comment was made during review within the Agency that asbestos-containing wastes subject to the proposed amendment are sometimes used to surface roadways and that this practice should be prohibited. The Agency agrees that the use of asbestos-containing wastes on roadways can cause asbestos emissions similar to those caused by the use of asbestos tailings on roadways, which is prohibited by the asbestos standard. Vehicular traffic on roadways can pulverize asbestos waste and liberate fibers that can become airborne in the wake of moving vehicles and by the wind. The use of asbestos-containing wastes has therefore been prohibited from use on roadways.

The proposed amendment for waste disposal at asbestos mills included a provision requiring no visible emissions to the outside air from the deposition of asbestos ore tailings onto a disposal pile. An alternative method of compliance required that the waste be adequately wetted with a dust suppressant agent prior to deposition. Two commentators stated that an exemption from the wetting requirement of the alternative method is needed when the temperature at the disposal site is below freezing, to prevent freezing of the tailings and permit continued operation of the asbestos mill at such low temperatures. The investigation carried out by the Agency prior to proposal of the amendment indicated that wetting of asbestos tailings is the only presently available method for effectively controlling particulate emissions from the deposition operation. In response to the comments received, the Agency further investigated the cold weather operational problems of disposal systems for wetted asbestos tailings. Discussions were held with operators of three Canadian asbestos mills that frequently operate under cold weather conditions and have installed tailings wetting systems, with a firm that is experienced in designing systems to suppress dust generated by materials conveying operations, and with several non-asbestos mineral mining facilities that operate wetting systems for crushing and conveying operations. The investigation revealed that several Canadian asbestos mills are presently experimenting with wet tailings disposal systems to extend operation to temperatures substantially below freezing. However, the Agency is aware of no such system that has operated in a continuous manner at temperatures below −9.5°C (15°F). Accordingly, the Agency has concluded that wet tailings disposal systems for asbestos mills are not available for disposal site temperatures below −9.5°C (15°F), and the proposed amendment has been changed to provide an exemption for wetting of tailings below this temperature. Only one existing domestic asbestos mill is expected to use the exemption to a significant extent. An examination of hourly temperatures representative of the location of that plan, and extending over a period of one year, showed that hourly temperatures are below 15°F for approximately 7 percent of the time.

Asbestos emissions at asbestos mill tailings disposal piles are contributed by the tailing conveying operation, the deposition operation, and wind entrainment of asbestos-containing particulate from the surface of the disposal pile. The first emission source is subject to previously promulgated regulations (38 FR 8820), and the latter two sources are subject to the amendments promulgated herein. The major sources of asbestos emissions from process gas streams at asbestos mills, namely effluents from crushers, dryers and milling equipment, are also covered by the previously promulgated regulations (38 FR 8820). The amendments promulgated herein, including an exemption from wetting of asbestos tailings at temperatures below −9.5° C (15° F), together with the standards promulgated on April 6, 1973 (38 FR 8820), represent use of the best available technology for control of emissions from asbestos mills. This is consistent with the determination of the Administrator that best available technology should be used to control major sources of asbestos emissions to protect the public health with an ample margin of safety.

The reporting format of Appendix A has been changed by the addition of paragraphs "C" and "D", to accommodate the addition of disposal of asbestos-containing wastes and certain inactive asbestos waste disposal sites to the amendments. The additional information required is essential for determining compliance with the regulations. Appendix A has also been revised into a new computer format which will promote more effective enforcement of the regulations. Section 61.24 has been revised to reflect the additional reporting information requested in Appendix A.

ADDITIONAL COMMENTS

Manufacturing and Fabrication. One comment questioned the need for including asphalt concrete manufacturing plants in the proposed amendments. The rationale for including asphalt concrete plants as major sources of asbestos is discussed in the background information document for the proposed amendments (EPA-450/2-74-009a). Two commentators suggested that the manufacture of asphalt concrete containing less than 3 to 5 percent asbestos in the total mixture should be exempt from the regulations. However, asbestos asphalt concrete typically contains 1 to 2 percent asbestos, and the Agency determined that asbestos asphalt concrete operations using even these low percentages of asbestos are major sources. No data or information were received that would indicate asphalt concrete plants are not major sources, and the regulations promulgated herein apply to such sources. The Agency received two comments that the individual emission sources within an asbestos asphalt concrete plant which are subject to the proposed amendments should be specified. The Agency feels that revisions are not necessary. Only component operations that may emit asbestos are covered by the provisions; for example, if no asbestos is added to the aggregate dryer, the emissions from the dryer alone are not covered.

The possibility that the enforcement of the amendments promulgated herein for asphalt concrete plants may be in conflict with the enforcement of new-source performance standards for asphalt concrete plants was raised by one commentator. It is possible that both the new source performance standard and the national emission standard for asbestos will apply simultaneously to emissions from some operations at some new and modified plants. Where this occurs, the visible emission standard promulgated herein applies to asbestos particulate matter, even though it is more restrictive than the opacity regulation of the new source performance standard. A more stringent standard is justified when asbestos is being processed because of the hazardous nature of asbestos.

Comments were received that the proposed definition of "fabricating" needed to be clarified. The Agency reviewed the definition and determined that changes in the definition are not necessary. Fabricating includes any type of processing, excluding field fabrication, performed on manufactured products that contain commercial asbestos. The Agency acknowledges that some component processes of asbestos fabricating operations could generate visible emissions in such a manner that the visible emissions do not contain asbestos generated by the process, though the commentators did not cite any specific examples. The Agency has observed this type of process in asbestos manufacturing operations. For example, visible emissions of organic materials are sometimes generated during the curing of asbestos friction products in operations where asbestos is bound into a matrix of non-asbestos material but the asbestos is not transferred into the emission stream. Such operations are in compliance with the standard of no visible emissions containing particulate asbestos material.

One commentator stated that some field fabrication operations release significant amounts of asbestos. The Agency's investigation prior to proposal of the amendments showed that there is only limited field fabrication of asbestos products other than insulating products. The fabrication of friable asbestos insulation was determined to be the only major asbestos field fabrication source, and this is regulated by prohibiting the use of such materials after the effective date of the amendments promulgated herein. In the judgment of the Administrator, the comment did not contain sufficient information to justify including other categories of asbestos field fabrication in the amendments. One commentator recommended that the Agency impose a standard of 0.03 grain per cubic foot for asbestos emissions in addition to the no-visible-emission standard. It is the judgment of the Agency that there are no sufficiently reliable emision measurement techniques to provide a basis for such a numerical standard and the setting of numerical standards should be delayed until accurate asbestos measuring techniques are available.

Demolition and Renovation. Comments were received which suggested that the proposed renovation provisions should not apply to operations carried out within buildings, or to operations regulated by the Occupational Safety and Health Administartion (OSHA) for worker exposure to asbestos. The Agency recognizes that there may be less asbestos emissions from stripping of friable asbestos materials within a structure than from stripping in an unenclosed area. However, asbestos from the stripping operation carried out within a building or structure can be discharged into the outside air from building ventilation systems, windows and doors. Further, the disposal of friable asbestos waste materials generated by renovation operations, which includes the transport of waste materials to a disposal site, is an emission source that needs to be controlled regardless of whether the renovation is performed in the outside air or in buildings. In the judgment of the Administrator, the control of such asbestos emissions is necessary and is part of the best available control technology. The OSHA regulations (29 CFR 1910.93a) require that, ". . . insofar as practicable . . .," asbestos material be removed while wetted effectively to prevent emission of asbestos in excess of the specified OSHA exposure limit, but also specifically require that employees shall be provided with respiratory equipment for all spraying, demolition and removal of asbestos materials. The purpose of the OSHA standard, to protect employees' health, can be achieved by the use of respiratory equipment, even in those situations where wetting is not implemented and emissions may produce concentrations in excess of the OSHA exposure limit. The extent to which the resulting concentrations in the outside air are protective of public health is unknown. Accordingly, the proposed renovating provisions do not exempt operations that are controlled by OSHA regulations.

Two commentators stated that the alternative to the wetting requirement in the demolition provisions at sub-freezing temperatures should be allowed at all temperatures. In contrast, another commentator suggested that suspension of the wetting requirements at sub-freezing temperatures should be subject to a permit procedure that would discourage demolition at sub-freezing temperatures. The alternative was proposed because, in the judgment of the Agency, worker safety would be unduly jeopardized by the unsafe footing caused by ice formation from water use under freezing conditions. The proposed alternative is less restrictive on demolition contractors than a second course of action that was considered, namely the prohibition of demolition under freezing conditions. The proposed alternative suspends only a portion of the wetting requirements under freezing conditions. Pipes, ducts, boilers, tanks, reactors, turbines, furnaces and structural members insulated or fireproofed with friable asbestos materials must be removed from the building in sections, to the maximum extent practicable, before wrecking of the building. The stripping of asbestos materials from the previously removed sections must be accompanied by wetting at all temperatures, and the resulting asbestos waste materials must be wetted at all temperatures. These procedures do not jeopardize worker safety. Therefore, the promulgated demolition provisions are based on the use of the best available emission control methods at all temperatures, and these methods are different for non-freezing and freezing conditions.

Another comment indicated that sprayed fireproofing was the only type of asbestos material that could cause asbestos emissions to the atmosphere during demolition operations, and that molded insulation is not readily released into the air. The Agency has inspected both types of materials and has found that some types of molded insulation and plaster that contain asbestos are friable. Therefore, buildings containing these materials are covered by the amendments promulgated herein.

Comments were received that the Agency has a responsibility to develop asbestos measurement methods and determine by use of measurement methods whether demolition is a major source of asbestos emissions. The Agency keeps abreast of newly developed measurement techniques in the asbestos industry, and the development of asbestos measurement techniques is currently being funded by the Agency. No new information on measurement techniques was received in the comments. The Agency previously made the determination that building demolition is a major source of asbestos emissions, and no new information has been submitted to demonstrate that it is not a major source. Demolition and renovation operations generate short-term exposures of urban populations to asbestos. Since promulgation of the demolition regulations on April 6, 1973, new biological evidence supporting the significance of single short-term exposures of asbestos has been obtained. One-day inhalation exposures in animal experiments have produced an increase in the incidence of mesotheliomas. (Wagner, J. C., Berry, G., and Timbrell, V., "The Effects of the Inhalation of Asbestos in Rats", *Br. J. Cancer 29*, pp. 252-269, 1974). A copy of this article is available for inspection at the Public Information Reference Center, Room 2404, Waterside Mall, 401 M Street, SW, Washington, D.C. 20460. It can be concluded that human asbestos exposure for periods typically required to perform demolition and renovation operations is hazardous. Therefore, the Agency has not changed its prior determination that building demolition is a major source of asbestos emissions. Another commentator was concerned that the demolition sources now covered by the asbestos standard as major sources were not defined as major sources by the National Academy of Sciences (NAS) study, which was cited by the Agency as a basis for the demolition regulation. The NAS study did not define categories of asbestos materials other than sprayed fireproofing as major emission sources because data were available at that time on fireproofing only. The Agency had concluded prior to proposing asbestos standards on December 7, 1971 that any friable asbestos material used for insulation or fireproofing has a comparable potential to create asbestos emissions upon demolition or renovation as sprayed fireproofing, and therefore these materials are also covered by the regulations.

Several comments were received stating that the definitions of "friable asbestos material," "asbestos," and "asbestos material" are vague and subjective and remain constitutionally deficient for a regulation enforceable by criminal proceedings. The Agency reevaluated the definitions and concluded that they are sufficiently clear that the owners or operators subject to the amendments can reasonably be expected to understand these terms. Owners or operators should be able to identify covered material and comply with the regulations on the basis of the definitions supplied.

Comments were made suggesting the Agency describe more specifically a proper wetting operation. The purpose of the wetting requirements is to reduce the amount of asbestos dust generated during demolition operations. Many different procedures would accomplish this; therefore, the Agency believes that specifying such procedures is neither necessary nor appropriate. A new definition of "adequately wetted" was added to the regulations promulgated herein. The Agency believes that owners or operators of demolition operations are familiar with proper wetting procedures.

Two comments were made stating that the proposed demolition and renovation amendments are not emission standards and that asbestos emissions must be proved in determining compliance with the regulations. Congress has specified that EPA should set emission standards for hazardous air pollutants. EPA, charged with implementing this requirement, has determined that the term "emission standard" includes work practice requirements designed to limit emissions. The position taken by the Administrator on this issue in the promulgation of the original regulations on asbestos on April 6, 1973 (38 FR 8820) is unchanged here. The demolition and renovation regulations require certain work procedures to be followed. These methods of control are required because of the impossibility at this time of prescribing and enforcing allowable numerical concentrations or mass emission limitations. One difficulty in prescribing a numerical emission standard is the relative inaccuracy of asbestos analytical methods. Dr. Arnold Brown, testifying in a recent court case involving asbestos emissions [*United States et al.* v. *Reserve Mining Co. et al.*, 498 F.2d 1073, 1079, (8th Cir., 1974)] stated, "It is reasonable to assume an error in the count of fibers in both water and air of at least nine times on the high side to one-ninth on the low side." Further testifying on the same subject, Dr. Brown stated, ". . . I do not recall having been exposed to a procedure with an error this large, and which people have seriously proposed a number based on this very poor procedure." Moreover, there is no place to measure the total emissions from a demolition or renovation operation. The Agency has determined that violations of the work practices specified in the demolition section will result in emissions of asbestos. Considering these facts, the prescription of work practices is not only a legally permissible form of an emission standard, but also the only practical and reasonable form.

Waste Disposal. A number of commentators questioned the relationship between the proposed no-visible-emissions requirements in the proposed asbestos waste disposal provisions and the alternative methods for complying with the requirement. The following points were included in the comments:

1. Can any of a variety of waste disposal methods be used to meet the no-visible-emissions limit?
2. Various other methods of disposal should be specified as alternatives.
3. The inclusion of a no-visible-emissions requirement in portions of the alternative methods of compliance is a paradox.
4. Various alternatives are either not feasible or are unnecessary for some specific waste disposal operations.

As stated in §§ 61.22 (j) and (k) of the proposed and promulgated amendments, a requirement for affected sources that dispose of asbestos waste is no visible emissions during waste disposal operations. This provides affected sources flexibility in developing and using those disposal techniques most suitable to individual needs. The Agency recognizes that the best available disposal methods for some of the sources may not be capable of preventing visible emissions during a minor portion of some of the disposal operations. Therefore, alternative methods of compliance that represent the best available disposal methods have been included in the regulations. Sources are not required to use these methods; they may use other methods that achieve no visible emissions. However, sources may elect to use one of the specified alternatives. Some of these alternatives result in no visible emissions; others may not. For those alternative methods that may not be capable of preventing visible emissions during all portions of the waste disposal process, a requirement has nevertheless been included that there be no visible emissions from those portions of the process that can achieve this performance level. The listing of a particular method of waste disposal as an alternative method of compliance does not imply that the method is universally applicable or that the use of the method is necessary to achieve no visible emissions.

Some comments questioned whether the proposed amendments would apply to asbestos waste disposal sites that were inactivated prior to the publication of the proposed amendments. Regulations established under section 112 of the Act are applicable to both existing sources and new sources. The amendments cover previously inactivated sites as well as sites that become inactive in the future. However, the proposed amendments have been revised as discussed in "Changes to the Proposed Amendments" so that only owners of sites which have been operated by asbestos mills, manufacturing plants, and fabricating plants subject to the asbestos standard must comply with the asbestos amendments proposed herein for inactive asbestos waste disposal sites.

Several commentators suggested that certain types of asbestos waste disposal sites should be excluded from the proposed amendments, depending upon the the rate at which asbestos waste is deposited at the site, the percentage of the total waste that is asbestos, the friability of the asbestos waste, and the extent to which the site is in active operation. These comments were considered, but no changes in the proposed amendments were made as a result of the Agency's reevaluation. It would be extremely difficult to enforce regulations that depend on the rate or asbestos content of waste deposition. Further, the provisions promulgated herein shift the focus of the waste disposal requirements away from the site operator to the generator of the waste. Because of this, the burden of the requirements on a waste disposal site operator who accepts only a very small quantity of asbestos waste, and who the commentators desire to exclude from the regulations, is largely removed.

A comment was made that the proposed amendments could cause considerable hardship to small users of asbestos because some waste disposal sites may no longer accept asbestos wastes. There are an estimated 6,000 waste disposal sites in the U.S. which meet the standards of a sanitary landfill. A properly operated sanitary landfill complies with the soil-covering requirements of the amendments, and therefore will be affected only slightly by handling asbestos wastes. Accordingly, the Agency believes that small manufacturers and users of asbestos will not encounter severe problems in complying with the amendments for waste disposal sites.

Two commentators were concerned that the proposed waste disposal provisions would cause serious problems in contract hauling arrangements; and in the use of private landfills, municipal landfills, and waste disposal sites leased by generators of the asbestos waste. Since the generator of the waste has the direct responsibility for compliance during the transport of waste and for disposing of the waste at a properly operated disposal site, the Agency believes that problems in contract hauling arrangements can be avoided if the generator institutes proper waste handling practices. The Agency also believes that the deletion in the promulgated amendments of some of the proposed requirements for posting of warning signs will remove many of the potential problems that were of concern. Further changes to the proposed amendments were judged unnecessary because they impose few additional requirements on disposal sites, such as municipal sanitary landfill sites, that are properly operated.

A comment suggested that bags which previously held commercial asbestos should be exempt if the bags have been cleaned sufficiently so that shaking the bags will not generate visible emissions of asbestos participate matter. Even if such wastes do not produce visible emissions during the subsequent processing, transporting and depositing operations at a waste disposal site, there is a need for ensuring proper ultimate waste disposal because such bags still are likely to contain residual asbestos. The Agency believes that regulations are needed for this purpose and also for the purpose of ensuring that emissions from the cited method of cleaning bags are properly controlled. Accordingly, the disposal of bags that have been cleaned in the manner described has not been exempted from the amendments promulgated herein.

Comments were received which stated that the proposed waste disposal provisions would probably preclude the disposal of waste asbestos cement pipe in commercial landfills. It is the Agency's judgment that commercial landfills which comply with the regulations will be available. Further, the pipe crushing operation that is conventionally carried out during compaction at the disposal site can alternatively be performed and controlled by gas cleaning equipment at a stationary crusher.

MERCURY.

CHANGES TO PROPOSED AMENDMENTS

The proposed definition of "sludge dryer" has been revised to indicate more clearly that only sludge drying operations that are directly heated by combustion gases are covered by the amendment. The amendment does not apply to devices that are indirectly heated, such as secondary mercury recovery furnaces.

A comment suggested that daily sludge sampling and analysis should be required to reveal potential variations in mercury content of the sludge. The daily averages of sludge mercury content are not expected to vary significantly, and the Agency believes that the added cost to the owners or operators of such sources for daily sampling and analysis of sludge is not justified. Variations in mercury concentration of sludge can occur over longer periods of time, however, and a requirement has been added that all facilities for which emissions are in excess of 1600 grams per day as determined by the initial compliance test must monitor on a yearly basis with the sludge sampling method. In addition, the Agency has authority to request sludge sampling and analysis, or stack sampling, and will exercise this authority whenever there are indications that a change in mercury concentration of the sludge has occurred that would significantly increase mercury emissions.

One commentator suggested several revisions to procedures in the proposed sludge testing method, Method 105. The procedures were reevaluated, and the method has been changed where appropriate. The proposed section 3.1.3 of Method 105 specified a 10 percent solution of stannous chloride as an alternative to stannous sulfate. One comment stated that it was inappropriate to require any solution percentage. The Agency agrees, and the requirement has been deleted. Another comment suggested that the required use of mercuric chloride of Bureau of Standards purity to prepare the mercury stock solution is not necessary because the precision of the method does not demand such purity. The Agency agrees with this comment, and the method has been changed to permit the use of reagent grade mercuric chloride. The comment was made that mercuric solutions should not be prepared in plastic containers. The Agency is in general agreement with this and a statement to this effect has been added to Method 105. Section 4.1.1 of the method specifies that the, ". . . sampling devices, glassware and reagents should be ascertained free of significant amounts of mercury." A major source of mercury contamination occurs when sample solutions and reagents come into contact with mercury-contaminated containers. A comment indicated that a specific quantity should be stated to indicate how much mercury is considered "significant." The Agency believes that the specification of an amount of mercury contamination is inappropriate because such an amount would be very difficult to measure. The mercury contamination of containers can be reduced to an insignificant amount by properly cleaning such containers before use. The proposed paragraph has therefore been changed to specify that sample containers shall be properly cleaned before use by rinsing with nitric acid, followed by rinsing with distilled water. Another comment suggested that the possible interferences with the analysis of mercury in sludge should be delineated and that preventative measures should be given. In response, two references in which such interferences are discussed have been added to Method 105.

ADDITIONAL COMMENTS

The Agency has determined that an ambient air mercury concentration of 1 microgram per cubic meter averaged over a 30-day period will protect the public health with an ample margin of safety. The maximum allowable mercury emission for sludge incineration and drying plants was calculated, by use of meteorological modeling techniques using restrictive dispersion conditions, that would not result in this ambient concentration being exceeded. The resulting maximum allowable emission is 3200 grams of mercury per day. Numerous comments were received that questioned the methodology used to calculate this emission limitation. Several comments questioned the derivation of the ambient concentration of 1 microgram per cubic meter, 30-day average, and indicated that this level should be lower. The Agency evaluated these comments, but determined that no new information had been presented that had not been previously considered in the derivation of this allowable concentration. Another commentator stated that the restrictive meteorological conditions used for sewage sludge incineration and drying plants do not represent the "worst case" meteorological conditions, and discussed a specific existing facility as an example. The Agency analyzed this comment considering the meterological conditions and topography at the specific site mentioned in the comment and concluded that, even with a mercury emission of 3200 grams per day, the public will be protected with an ample margin of safety at the cited facility. A copy of the Agency response to this comment is available for inspection at the Public Information Reference Center, Room 2404 Waterside Mall, 401 M St., Wash., D.C. 20460. The Agency knows of no sludge incineration or drying facility where the ambient guideline level of one microgram of mercury per cubic meter, 30-day average, will be exceeded. The following comments stating that the proposed emission limit is too stringent or that additional studies are needed before promulgation were received:

1. The proposed emission limit provides an excessive safety factor for some plant locations.
2. The proposed emission limit should be based on plant size, allowing larger emissions for larger plants.
3. The intent of the proposed amendment seems to be to limit the size of new plants and require disposal of sludge by alternative methods.
4. The regulation seems to be excessively stringent in order to simplify the administration of the standard for multiple sources.
5. There is not enough information to justify promulgating the amendment at this time; the promulgation should be delayed until further studies are made.

In contrast, several comments suggested that the proposed emission limit was too lenient. Since the emission limitation is related to an ambient concentration, it would be inappropriate to allow higher emissions for larger plants. Concerning plant location, it would be impractical to specify a different emission limitation for each present or future plant location which reflected local meteorological conditions. Moreover, section 112 of the Act provides for a national standard, and the Administrator has set this standard at a level which will prevent exceeding the specified safe ambient level at all locations. The Agency determined that there is sufficient information to justify promulgating emission regulations for sludge incinerators and no data or information were presented that would justify changing the mercury emission limit of 3200 grams per day.

A comment was made that the impact of multiple sources of mercury emissions was not addressed in the derivation of the national emission standard for mercury. While the standard does not include special provisions for multiple sources, it does provide a large safety factor at many sites and this provides a measure of protection against the multiple source problem. The Agency knows of no location where existing multiple sources of mercury will cause the ambient guideline level of one microgram of mercury per cubic meter, 30-day average, to be exceeded. The Agency must approve all new construction or modification of sources regulated by the mercury standard. During the review of such construction or modification, the Agency will assess the impact that the new or modified sources have on the ambient mercury concentration. If the Agency discovers a situation where a source can cause the guideline ambient concentration to be exceeded, the national emission standard will be reevaluated. In addition, local planning agencies have the capability to prevent multiple source pollution problems through proper land use planning. The Agency urges these local agencies to consider the impact of multiple sources on such problems as mercury air pollution when making planning decisions.

Comments were received that questioned whether all sludge incineration and drying plants are major sources of mercury emissions that must demonstrate compliance with the standard. All of these facilities have the potential to emit mercury; the amount of mercury that is emitted depends upon the mercury content of the sludge and the sludge incineration or drying rate. Accordingly, all such facilities must demonstrate compliance with the emission limitation promulgated herein.

A comment was received that the economic impact of the proposed amendments on some large facilities may be large, since there may be few or no alternatives for sludge disposal. The Agency estimates that the largest mercury emission from an existing sludge incinerator or dryer is approximately 500 grams per day, which is approximately one-sixth of the maximum allowable emission. The time period over which sludge generation would increase in excess of six-fold should provide sufficient lead time for planning an economically feasible alternate disposal method, if it is required. The Agency therefore does not foresee a significant economic impact for the near future at any sludge incineration or drying plant.

Several comments stated that other sources such as ore processing plants, mercury compound manufacturing plants, industrial waste incinerators, coal-fired power plants, and rooms painted with mercury-containing paints should be investigated and regulated if necessary. The Agency previously investigated mercury emissions from nonferrous smelting plants, secondary mercury production plants, coal-fired power plants, and solid waste incineration plants, and determined that these sources do not emit mercury in such quantities that they are likely to cause the ambient mercury concentration to exceed one microgram per cubic meter. The Agency has regulated all sources that may reasonably be expected to cause an ambient mercury concentration of as much as one microgram per cubic meter, 30-day average. However, the Agency will continue a policy of investigating any source of mercury that it has reason to believe has the potential to endanger the public health.

Another comment stated that the Agency should give specific suggestions, or references should be provided, for disposing of mercury-containing sludges on land in a manner that would protect water resources. The Agency's Office of Water and Hazardous Materials is preparing technical publications on various alternatives for the disposal of sludges, and such materials should be available in the near future.

Several comments were made on the mercury collection efficiency of water scrubbers. One commentator suggested that the mercury collection efficiency of individual water scrubbers should be assumed to be zero for purposes of determining compliance, until positively proven otherwise. Another commentator stated that the proposed sludge sampling method should take into account the amount of mercury that would be collected by a scrubber. The Agency has determined that the requirements of the standard are adequate. No credit for mercury removed by water scrubbers is allowed when compliance is determined by sludge sampling and analysis; however, if the mercury stack measurement method is used to determine compliance, only the amount of mercury emitted to the outside air is measured and any mercury collection by the system is taken into account. The Agency has determined that sludge sampling and analysis can be used as an alternative method to determine maximum mercury emissions, because it is sufficiently accurate. The method is also inexpensive when compared to a complete stack test.

The following comments were received which suggested changes to Method 105 for sludge sampling:

1. A 5 percent potassium permanganate solution is difficult to prepare, and a saturated solution should be required.

2. Potassium permanganate should be used to stabilize mercury solutions.

3. Hydroxylamine hydrochloride can be used in place of the uncommon salt sodium chloride-hydroxylamine sulfate to reduce excess potassium permanganate.

Solutions of 5 percent potassium permanganate can be prepared at room temperature. The Agency has no experience in using potassium permanganate to stabilize mercury solutions, and has not used hydroxylamine hydrochloride to reduce excess potassium permanganate. The method has proved to be satisfactory without the use of the suggested reagents. The Agency believes that the suggested changes are not necessary and the method has not been revised to accommodate these suggestions.

ENVIRONMENTAL AND ENERGY IMPACT

Environmental impact statements must accompany national emission standards for hazardous air pollutants approved for proposal after October 14, 1974. The amendments recommended for promulgation were approved for proposal prior to this date, and an environmental impact statement has not been prepared. The environmental impact of the standards has been assessed, however, and is discussed in the background information document (EPA-450/2-74-009a) for the proposed standards and in the preamble (39 FR 38064) to the proposed standards.

The energy impact resulting from the control of asbestos waste disposal operations at asbestos emission sources and at waste disposal sites is expected to be insignificant since this waste is already collected and deposited at waste disposal sites. Only a relatively small quantity of additional waste material is generated as a result of better control of particulate emissions from manufacturing and fabrication sources covered by the standard. The major energy impact of the amendments is that resulting from the operation of fabric filtration devices at manufacturing and fabrication plants. It is estimated that approximately 170 baghouses of 1000 acfm capacity will be required to comply with the amendments. The operation of these control devices will require the consumption of 2.5 million kilowatt hours per year, which is equivalent to 3900 barrels per year of Number 6 fuel oil at the power generating station. The energy impact resulting from the NESHAPS amendment is small and is justified by the increased control of asbestos emissions.

There is no energy impact that results from the regulation of mercury emissions from sludge incinerators and dryers.

Effective upon promulgation.

(Sec. 112 and 114 of the Clean Air Act, as amended (42 U.S.C. 1857c-7 and 9))

Dated: October 3, 1975.

JOHN QUARLES,
Acting Administrator.

Part 61 of Chapter I, Title 40 of the Code of Federal Regulations is amended as follows:

1. The table of sections is amended as follows:

Subpart A—General Provisions

Sec.

* * * * *

61.17 Circumvention.

* * * * *

Subpart B—National Emission Standard for Asbestos

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61.25 Waste disposal sites.

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Subpart E—National Emission Standard for Mercury

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61.54 Sludge sampling.
61.55 Emission monitoring.

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Appendix B—Test Methods

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Method 105—Method for determination of mercury in wastewater treatment plant sewage sludges.

2. The authority citation at the end of the table of sections for Part 61 is revised to read as follows:

AUTHORITY: Secs. 112 and 114 of the Clean Air Act, as amended by sec. 4(a) of Pub. L. 91-604, 84 Stat. 1678 (42 U.S.C. 1857c-7, 1857c-9).

Subpart A—General Provisions

3. Section 61.14 is amended by revising paragraph (c), and adding paragraph (d). The revised and added paragraphs read as follows:

§ 61.14 Source test and analytical methods.

* * * * *

(c) The Administrator may, after notice to the owner or operator, withdraw approval of an alternative method granted under paragraphs (a), (b) or (d) of this section. Where the test results using an alternative method do not adequately indicate whether a source is in compliance with a standard, the Administrator may require the use of the reference method or its equivalent.

(d) Method 105 in Appendix B to this part is hereby approved by the Administrator as an alternative method for sources subject to § 61.52(b).

4. A new § 61.17 is added to subpart A as follows:

§ 61.17 Circumvention.

No owner or operator subject to the provisions of this part shall build, erect, install, or use any article, machine, equipment, process, or method, the use of which conceals an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous dilutants to achieve compliance with a visible emissions standard, and the piecemeal carrying out of an operation to avoid coverage by a standard that applies only to operations larger than a specified size.

Subpart B—National Emission Standard for Asbestos

5. Section 61.21 is amended by revising paragraph (j) and adding paragraphs (k), (l), (m), (n), (o), (p), (q), (r), (s), (t), (u), (v), and (w). The revised and added paragraphs read as follows:

§ 61.21 Definitions.

* * * * *

(j) "Demolition" means the wrecking or taking out of any load-supporting structural member and any related removing or stripping of friable asbestos materials.

(k) "Friable asbestos material" means any material that contains more than 1 percent asbestos by weight and that can be crumbled, pulverized, or reduced to powder, when dry, by hand pressure.

(l) "Control device asbestos waste" means any asbestos-containing waste material that is collected in a pollution control device.

(m) "Renovation" means the removing or stripping of friable asbestos material used to insulate or fireproof any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member. Operations in which load-supporting structural members are wrecked or taken out are excluded.

(n) "Planned renovation" means a renovation operation, or a number of such operations, in which the amount of friable asbestos material that will be removed or stripped within a given period of time can be predicted. Operations that are individually non-scheduled are included, provided a number of such operations can be predicted to occur during a given period of time based on operating experience.

(o) "Emergency renovation" means a renovation operation that results from a sudden, unexpected event, and is not a planned renovation. Operations necessitated by non-routine failures of equipment are included.

(p) "Adequately wetted" means sufficiently mixed or coated with water or an aqueous solution to prevent dust emissions.

(q) "Removing" means taking out friable asbestos materials used to insulate or fireproof any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member from any building, structure, facility, or installation.

(r) "Stripping" means taking off friable asbestos materials used for insulation or fireproofing from any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member.

(s) "Fabricating" means any processing of a manufactured product containing commercial asbestos, with the exception of processing at temporary sites for the construction or restoration of buildings, structures, facilities or installations.

(t) "Inactive waste disposal site" means any disposal site or portion thereof where additional asbestos-containing waste material will not be deposited and where the surface is not disturbed by vehicular traffic.

(u) "Active waste disposal site" means any disposal site other than an inactive site.

(v) "Roadways" means surfaces on which motor vehicles travel including, but not limited to, highways, roads, streets, parking areas, and driveways.

(w) "Asbestos-containing waste material" means any waste which contains commercial asbestos and is generated by a source subject to the provisions of this subpart, including asbestos mill tailings, control device asbestos waste, friable asbestos waste material, and bags or containers that previously contained commercial asbestos.

6. Section 61.22 is amended by amending paragraphs (c) and (e), revising paragraphs (b), (d), (f), and (g) and adding paragraphs (h), (i), (j), (k), and (l). The revised and added paragraphs read as follows:

§ 61.22 Emission standard.

* * * * *

(b) Roadways: The surfacing of roadways with asbestos tailings or with asbestos-containing waste that is generated by any source subject to paragraphs (c), (d), (e) or (h) of this section is prohibited, except for temporary roadways on an area of asbestos ore deposits. The deposition of asbestos tailings or asbestos-containing waste on roadways covered with snow or ice is considered "surfacing."

(c) Manufacturing: There shall be no visible emissions to the outside air, except as provided in paragraph (f) of this section, from any of the following operations if they use commercial asbestos or from any building or structure in which such operations are conducted.

* * * * *

(10) The manufacture of shotgun shells.

(11) The manufacture of asphalt concrete.

(d) Demolition and renovation: The requirements of this paragraph shall apply to any owner or operator of a demolition or renovation operation who intends to demolish any institutional, commercial, or industrial building (including apartment buildings having more than four dwelling units), structure, facility, installation, or portion thereof which contains any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member that is insulated or fireproofed with friable asbestos material, except as provided in paragraph (d)(1) of this section; or who intends to renovate any institutional, commercial, or industrial building, structure, facility, installation, or portion thereof where more than 80 meters (ca. 260 feet) of pipe insulated or fireproofed with friable asbestos material are stripped or removed, or more than 15 square meters (ca. 160 square feet) of friable asbestos material used to insulate or fireproof any duct, boiler, tank, reactor, turbine, furnace, or structural member are stripped or removed.

(1)(i) The owner or operator of a demolition operation is exempted from the requirements of this paragraph provided, (1) the amount of friable asbestos material in the building or portion thereof to be demolished is less than 80 meters (ca. 260 feet) used to insulate pipes, and less than 15 square meters (ca. 160 square feet) used to insulate or fireproof any duct, boiler, tank, reactor, turbine, furnace, or structural member, and (2) the notification requirements of paragraph (d)(1)(ii) are met.

(ii) Written notification shall be postmarked or delivered to the Administrator at least 20 days prior to commencement of demolition and shall include the information required by paragraph (d)(2) of this section, with the exception of the information required by paragraphs (d)(2)(iii), (vi), (vii), (viii), and (ix), and shall state the measured or estimated amount of friable asbestos material used for insulation and fireproofing which is present. Techniques of estimation shall be explained.

(2) Written notice of intention to demolish or renovate shall be provided to the Administrator by the owner or operator of the demolition or renovation operation. Such notice shall be postmarked or delivered to the Administrator at least 10 days prior to commencement of demo-

lition, or as early as possible prior to commencement of emergency demolition subject to paragraph (d)(6) of this section, and as early as possible prior to commencement of renovation. Such notice shall include the following information:

(i) Name of owner or operator.

(ii) Address of owner or operator.

(iii) Description of the building, structure, facility, or installation to be demolished or renovated, including the size, age, and prior use of the structure, and the approximate amount of friable asbestos material used for insulation and fireproofing.

(iv) Address or location of the building, structure, facility, or installation.

(v) Scheduled starting and completion dates of demolition or renovation.

(vi) Nature of planned demolition or renovation and method(s) to be employed.

(vii) Procedures to be employed to meet the requirements of this paragraph and paragraph (j) of this section.

(viii) The name and address or location of the waste disposal site where the friable asbestos waste will be deposited.

(ix) Name, title, and authority of the State or local governmental representative who has ordered a demolition which is subject to paragraph (d)(6) of this section.

(3)(i) For purposes of determining whether a planned renovating operation constitutes a renovation within the meaning of this paragraph, the amount of friable asbestos material to be removed or stripped shall be:

(A) For planned renovating operations involving individually non-scheduled operations, the additive amount of friable asbestos material that can be predicted will be removed or stripped at a source over the maximum period of time for which a prediction can be made. The period shall be not less than 30 days and not longer than one year.

(B) For each planned renovating operation not covered by paragraph (d)(3)(i)(A), the total amount of friable asbestos material that can be predicted will be removed or stripped at a source.

(ii) For purposes of determining whether an emergency renovating operation constitutes a renovation within the meaning of this paragraph, the amount of friable asbestos material to be removed or stripped shall be the total amount of friable asbestos material that will be removed or stripped as a result of the sudden, unexpected event that necessitated the renovation.

(4) The following procedures shall be used to prevent emissions of particulate asbestos material to outside air:

(i) Friable asbestos materials, used to insulate or fireproof any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member, shall be removed from any building, structure, facility or installation subject to this paragraph. Such removal shall occur before wrecking or dismantling of any portion of such building, structure, facility, or installation that would break up the friable asbestos materials and before wrecking or dismantling of any other portion of such building, structure, facility, or installation that would preclude access to such materials for subsequent removal. Removal of friable asbestos materials used for insulation or fireproofing of any pipe, duct, or structural member which are encased in concrete or other similar structural material is not required prior to demolition, but such material shall be adequately wetted whenever exposed during demolition.

(ii) Friable asbestos materials used to insulate or fireproof pipes, ducts, boilers, tanks, reactors, turbines, furnaces, or structural members shall be adequately wetted during stripping, except as provided in paragraphs (d)(4)(iv), (d)(4)(vi) or (d)(4)(vii) of this section.

(iii) Pipes, ducts, boilers, tanks, reactors, turbines, furnaces, or structural members that are insulated or fireproofed with friable asbestos materials may be taken out of any building, structure, facility, or installation subject to this paragraph as units or in sections provided the friable asbestos materials exposed during cutting or disjointing are adequately wetted during the cutting or disjointing operation. Such units shall not be dropped or thrown to the ground, but shall be carefully lowered to ground level.

(iv) The stripping of friable asbestos materials used to insulate or fireproof any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member that has been removed as a unit or in sections as provided in paragraph (d)(4)(iii) of this section shall be performed in accordance with paragraph (d)(4)(ii) of this section. Rather than comply with the wetting requirement, a local exhaust ventilation and collection system may be used to prevent emissions to the outside air. Such local exhaust ventilation systems shall be designed and operated to capture the asbestos particulate matter produced by the stripping of friable asbestos material. There shall be no visible emissions to the outside air from such local exhaust ventilation and collection systems except as provided in paragraph (f) of this section.

(v) All friable asbestos materials that have been removed or stripped shall be adequately wetted to ensure that such materials remain wet during all remaining stages of demolition or renovation and related handling operations. Such materials shall not be dropped or thrown to the ground or a lower floor. Such materials that have been removed or stripped more than 50 feet above ground level, except those materials removed as units or in sections, shall be transported to the ground via dust-tight chutes or containers.

(vi) Except as specified below, the wetting requirements of this paragraph are suspended when the temperature at the point of wetting is below 0°C (32°F). When friable asbestos materials are not wetted due to freezing temperatures, such materials on pipes, ducts, boilers, tanks, reactors, turbines, furnaces, or structural members shall, to the maximum extent possible, be removed as units or in sections prior to wrecking. In no case shall the requirements of paragraphs (d)(4)(iv) or (d)(4)(v) be suspended due to freezing temperatures.

(vii) For renovation operations, local exhaust ventilation and collection systems may be used, instead of wetting as specified in paragraph (d)(4)(ii), to prevent emissions of particulate asbestos material to outside air when damage to equipment resulting from the wetting would be unavoidable. Upon request and supply of adequate information, the Administrator will determine whether damage to equipment resulting from wetting to comply with the provisions of this paragraph would be unavoidable. Such local exhaust ventilation systems shall be designed and operated to capture the asbestos particulate matter produced by the stripping and removal of friable asbestos material. There shall be no visible emissions to the outside air from such local exhaust ventilation and collection systems, except as provided in paragraph (f) of this section.

(5) Sources subject to this paragraph are exempt from the requirements of §§ 61.05(a), 61.07, and 61.09.

(6) The demolition of a building, structure, facility, or installation, pursuant to an order of an authorized representative of a State or local governmental agency, issued because that building is structurally unsound and in danger of imminent collapse is exempt from all but the following requirements of paragraph (d) of this section:

(i) The notification requirements specified by paragraph (d)(2) of this section;

(ii) The requirements on stripping of friable asbestos materials from previously removed units or sections as specified in paragraph (d)(4)(iv) of this section;

(iii) The wetting, as specified by paragraph (d)(4)(v) of this section, of friable asbestos materials that have been removed or stripped;

(iv) The portion of the structure being demolished that contains friable asbestos materials shall be adequately wetted during the wrecking operation.

(e) * * *

(2) Any owner or operator who intends to spray asbestos materials which contain more than 1 percent asbestos on a dry weight basis to insulate or fireproof equipment and machinery shall report such intention to the Administrator at least 20 days prior to the commencement of the spraying operation. Such report shall include the following information:

* * *

(f) Rather than meet the no-visible-emission requirements as specified by paragraphs (a), (c), (d), (e), (h), (j), and (k) of this section, an owner or operator may elect to use the methods specified by § 61.23 to clean emissions containing particulate asbestos material before such emissions escape to, or are vented to, the outside air.

(g) Where the presence of uncombined water is the sole reason for failure to meet the no-visible-emission requirement of paragraphs (a), (c), (d), (e), (h), (j), or (k) of this section, such failure shall not be a violation of such emission requirements.

(h) Fabricating: There shall be no visible emissions to the outside air, except as provided in paragraph (f) of this section, from any of the following operations if they use commercial asbestos or from any building or structure in which such operations are conducted.

(1) The fabrication of cement building products.

(2) The fabrication of friction products, except those operations that primarily install asbestos friction materials on motor vehicles.

(3) The fabrication of cement or silicate board for ventilation hoods; ovens; electrical panels; laboratory furniture; bulkheads, partitions and ceilings for marine construction; and flow control devices for the molten metal industry.

(i) Insulating: Molded insulating materials which are friable and wet-applied insulating materials which are friable after drying, installed after the effective date of these regulations, shall contain no commercial asbestos. The provisions of this paragraph do not apply to insulating materials which are spray applied; such materials are regulated under § 61.22(e).

(j) Waste disposal for manufacturing, fabricating, demolition, renovation and spraying operations: The owner or operator of any source covered under the provisions of paragraphs (c), (d), (e), or (h) of this section shall meet the following standards:

(1) There shall be no visible emissions to the outside air, except as provided in paragraph (j)(3) of this section, during the collection; processing, including incineration; packaging; transporting; or deposition of any asbestos-containing waste material which is generated by such source.

(2) All asbestos-containing waste material shall be deposited at waste disposal sites which are operated in accordance with the provisions of § 61.25.

(3) Rather than meet the requirement of paragraph (j)(1) of this section, an owner or operator may elect to use either of the disposal methods specified under (j)(3)(i) and (ii) of this section, or an alternative disposal method which has received prior approval by the Administrator:

(i) Treatment of asbestos-containing waste material with water:

(A) Control device asbestos waste shall be thoroughly mixed with water into a slurry and other asbestos-containing waste material shall be adequately wetted. There shall be no visible emissions to the outside air from the collection, mixing and wetting operations, except as provided in paragraph (f) of this section.

(B) After wetting, all asbestos-containing waste material shall be sealed into leak-tight containers while wet, and such containers shall be deposited at waste disposal sites which are operated in accordance with the provisions of § 61.25.

(C) The containers specified under paragraph (j)(3)(i)(B) of this section shall be labeled with a warning label that states:

CAUTION

Contains Asbestos
Avoid Opening or Breaking Container
Breathing Asbestos is Hazardous
to Your Health

Alternatively, warning labels specified by Occupational Safety and Health Standards of the Department of Labor, Occupational Safety and Health Administration (OSHA) under 29 CFR 1910.93a(g)(2)(ii) may be used.

(ii) Processing of asbestos-containing waste material into non-friable forms:

(A) All asbestos-containing waste material shall be formed into non-friable pellets or other shapes and deposited at waste disposal sites which are operated in accordance with the provisions of § 61.25.

(B) There shall be no visible emissions to the outside air from the collection and processing of asbestos-containing waste material, except as specified in paragraph (f) of this section.

(4) For the purposes of this paragraph (j), the term all asbestos-containing waste material as applied to demolition and renovation operations covered by paragraph (d) of this section includes only friable asbestos waste and control device asbestos waste.

(k) Waste disposal for asbestos mills: The owner or operator of any source covered under the provisions of paragraph (a) of this section shall meet the following standard:

(1) There shall be no visible emissions to the outside air, except as provided in paragraph (k)(3) of this section, during the collection, processing, packaging, transporting or deposition of any asbestos-containing waste material which is generated by such source.

(2) All asbestos-containing waste material shall be deposited at waste disposal sites which are operated in accordance with the provisions of § 61.25.

(3) Rather than meet the requirement of paragraph (k)(1) of this section, an owner or operator may elect to meet the following requirements in paragraphs (k)(3)(i) and (ii), or use an alternative disposal method which has received prior approval by the Administrator:

(i) There shall be no visible emissions to the outside air from the transfer of control device asbestos waste to the tailings conveyor, except as provided in paragraph (f) of this section. Such waste shall be subsequently processed either as specified in paragraph (k)(3)(ii) of this section or as specified in paragraph (j)(3) of this section.

(ii) All asbestos-containing waste material shall be adequately mixed, with a wetting agent recommended by the manufacturer of the agent to effectively wet dust and tailings, prior to deposition at a waste disposal site. Such agent shall be used as recommended for the particular dust by the manufacturer of the agent. There shall be no discharge of visible emissions to the outside air from the wetting operation except as specified in paragraph (f) of this section. Wetting may be suspended when the ambient temperature at the waste disposal site is less than −9.5°C (ca. 15°F). The ambient air temperature shall be determined by an appropriate measurement method with an accuracy of ±1°C (±2°F) and recorded at least at hourly intervals during the period that the operation of the wetting system is suspended. Records of such temperature measurements shall be retained at the source for a minimum of two years and made available for inspection by the Administrator.

(l) The owner of any inactive waste disposal site, which was operated by sources covered under § 61.22 (a), (c) or (h) and where asbestos-containing waste material produced by such sources was deposited, shall meet the following standards:

(1) There shall be no visible emissions to the outside air from an inactive waste disposal site subject to this paragraph, except as provided in paragraph (l)(5) of this section.

(2) Warning signs shall be displayed at all entrances, and along the property line of the site or along the perimeter of the sections of the site where asbestos-containing waste material was deposited, at intervals of 100 m (ca. 330 ft) or less, except as specified in paragraph (l)(4) of this section. Signs shall be posted in such a manner and location that a person may easily read the legend. The warning signs required by this paragraph shall conform to the requirements of 20″ x 14″ upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph. The signs shall display the following legend in the lower panel, with letter sizes and styles of a visibility at least equal to those specified in this paragraph.

LEGEND

Asbestos Waste Disposal Site

Do Not Create Dust

Breathing Asbestos is Hazardous
to Your Health

Notation

1″ Sans Serif, Gothic or Block

¾″ Sans Serif, Gothic or Block

14 Point Gothic

Spacing between lines shall be at least equal to the height of the upper of the two lines.

(3) The perimeter of the site shall be fenced in a manner adequate to deter access by the general public, except as specified in paragraph (l)(4) of this section.

(4) Warning signs and fencing are not required where the requirements of paragraphs (l)(5) (i) or (ii) of this section are met, or where a natural barrier adequately deters access by the general public. Upon request and supply of appropriate information, the Administrator will determine whether a fence or a natural barrier adequately deters access to the general public.

(5) Rather than meet the requirement of paragraph (l)(1) of this section, an owner may elect to meet the requirements of this paragraph or may use an alternative control method for emissions from inactive waste disposal sites which

has received prior approval by the Administrator.

(i) The asbestos-containing waste material shall be covered with at least 15 centimeters (ca. 6 inches) of compacted non-asbestos-containing material, and a cover of vegetation shall be grown and maintained on the area adequate to prevent exposure of the asbestos-containing waste material; or

(ii) The asbestos-containing waste material shall be covered with at least 60 centimeters (ca. 2 feet) of compacted non-asbestos-containing material and maintained to prevent exposure of the asbestos-containing waste; or

(iii) For inactive waste disposal sites for asbestos tailings, a resinous or petroleum-based dust suppression agent which effectively binds dust and controls wind erosion shall be applied. Such agent shall be used as recommended for the particular asbestos tailings by the dust suppression agent manufacturer. Other equally effective dust suppression agents may be used upon prior approval by the Administrator. For purposes of this paragraph, waste crankcase oil is not considered a dust suppression agent.

7. The first sentence in § 61.23 is revised as follows:

§ 61.23 Air-Cleaning.

If air-cleaning is elected, as permitted by §§ 61.22(f) and 61.22(d)(4)(iv), the requirements of this section must be met. * * *

8. The first sentence in § 61.24 is revised and redesignated as paragraph (e) and new paragraphs (c) and (d) are added as follows:

§ 61.24 Reporting.

* * * * *

(c) For sources subject to §§ 61.22(j) and 61.22(k):

(1) A brief description of each process that generates asbestos-containing waste material.

(2) The average weight of asbestos-containing waste material disposed of, measured in kg/day.

(3) The emission control methods used in all stages of waste disposal.

(4) The type of disposal site or incineration site used for ultimate disposal, the name of the site operator, and the name and location of the disposal site.

(d) For sources subject to § 61.22(l):

(1) A brief description of the site.

(2) The method or methods used to comply with the standard, or alternative procedures to be used.

(e) Such information shall accompany the information required by § 61.10. The information described in this section shall be reported using the format of Appendix A of this part.

9. A new section 61.25 is added to subpart B as follows:

§ 61.25 Waste disposal sites.

In order to be an acceptable site for disposal of asbestos-containing waste material under § 61.22 (j) and (k), an active waste disposal site shall meet the requirements of this section.

(a) There shall be no visible emissions to the outside air from any active waste disposal site where asbestos-containing waste material has been deposited, except as provided in paragraph (e) of this section.

(b) Warning signs shall be displayed at all entrances, and along the property line of the site or along the perimeter of the sections of the site where asbestos-containing waste material is deposited, at intervals of 100 m (ca. 330 ft) or less except as specified in paragraph (d) of this section. Signs shall be posted in such a manner and location that a person may easily read the legend. The warning signs required by this paragraph shall conform to the requirements of 20" x 14" upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph. The signs shall display the following legend in the lower panel, with letter sizes and styles of a visibility at least equal to those specified in this paragraph.

LEGEND	NOTATION
ASBESTOS WASTE DISPOSAL SITE	1" Sans Serif, Gothic or Block
Do Not Create Dust	¾" Sans Serif, Gothic or Block
Breathing Asbestos is Hazardous to Your Health	14 Point Gothic

Spacing between lines shall be at least equal to the height of the upper of the two lines.

(c) The perimeter of the disposal site shall be fenced in order to adequately deter access to the general public except as specified in paragraph (d) of this section.

(d) Warning signs and fencing are not required where the requirements of paragraph (e)(1) of this section are met, or where a natural barrier adequately deters access to the general public. Upon request and supply of appropriate information, the Administrator will determine whether a fence or a natural barrier adequately deters access to the general public.

(e) Rather than meet the requirement of paragraph (a) of this section, an owner or operator may elect to meet the requirements of paragraph (e)(1) or (e)(2) of this section, or may use an alternative control method for emissions from active waste disposal sites which has received prior approval by the Administrator.

(1) At the end of each operating day, or at least once every 24-hour period while the site is in continuous operation, the asbestos-containing waste material which was deposited at the site during the operating day or previous 24-hour period shall be covered with at least 15 centimeters (ca. 6 inches) of compacted non-asbestos-containing material.

(2) At the end of each operating day, or at least once every 24-hour period while the disposal site is in continuous operation, the asbestos-containing waste material which was deposited at the site during the operating day or previous 24-hour period shall be covered with a resinous or petroleum-based dust suppression agent which effectively binds dust and controls wind erosion. Such agent shall be used as recommended for the particular dust by the dust suppression agent manufacturer. Other equally effective dust suppression agents may be used upon prior approval by the Administrator. For purposes of this paragraph, waste crankcase oil is not considered a dust suppression agent.

Subpart E—National Emission Standard for Mercury

10. Section 61.50 is revised to read as follows:

§ 61.50 Applicability.

The provisions of this subpart are applicable to those stationary sources which process mercury ore to recover mercury, use mercury chlor-alkali cells to produce chlorine gas and alkali metal hydroxide, and incinerate or dry wastewater treatment plant sludge.

11. Section 61.51 is amended by adding paragraphs (l) and (m) as follows:

§ 61.51 Definitions.

* * * * *

(l) "Sludge" means sludge produced by a treatment plant that processes municipal or industrial waste waters.

(m) "Sludge dryer" means a device used to reduce the moisture content of sludge by heating to temperatures above 65°C (ca. 150°F) directly with combustion gases.

12. Section 61.52 is revised to read as follows:

§ 61.52 Emission standard.

(a) Emissions to the atmosphere from mercury ore processing facilities and mercury cell chlor-alkali plants shall not exceed 2300 grams of mercury per 24-hour period.

(b) Emissions to the atmosphere from sludge incineration plants, sludge drying plants, or a combination of these that process wastewater treatment plant sludges shall not exceed 3200 grams of mercury per 24-hour period.

13. Section 61.53 is amended by adding paragraph (d) as follows:

§ 61.53 Stack sampling.

* * * * *

(d) Sludge incineration and drying plants.

(1) Unless a waiver of emission testing is obtained under § 61.13, each owner or operator of a source subject to the standard in § 61.52(b) shall test emissions from that source. Such tests shall be conducted in accordance with the procedures set forth either in paragraph (d) of this section or in § 61.54.

(2) Method 101 in Appendix B to this part shall be used to test emissions as follows:

(i) The test shall be performed within 90 days of the effective date of these regulations in the case of an existing source or a new source which has an initial startup date preceding the effective date.

(ii) The test shall be performed within 90 days of startup in the case of a new source which did not have an initial startup date preceding the effective date.

(3) The Administrator shall be notified at least 30 days prior to an emission test, so that he may at his option observe the test.

(4) Samples shall be taken over such a period or periods as are necessary to determine accurately the maximum emissions which will occur in a 24-hour period. No changes shall be made in the operation which would potentially increase emissions above the level determined by the most recent stack test, until the new emission level has been estimated by calculation and the results reported to the Administrator.

(5) All samples shall be analyzed, and mercury emissions shall be determined within 30 days after the stack test. Each determination shall be reported to the Administrator by a registered letter dispatched before the close of the next business day following such determination.

(6) Records of emission test results and other data needed to determine total emissions shall be retained at the source and shall be made available, for inspection by the Administrator, for a minimum of 2 years.

14. Sections 61.54 and 61.55 are added as follows:

§ 61.54 Sludge sampling.

(a) As an alternative means for demonstrating compliance with § 61.52 (b), an owner or operator may use Method 105 of Appendix B and the procedures specified in this section.

(1) A sludge test shall be conducted within 90 days of the effective date of these regulations in the case of an existing source or a new source which has an initial startup date preceding the effective date; or

(2) A sludge test shall be conducted within 90 days of startup in the case of a new source which did not have an initial startup date preceding the effective date.

(b) The Administrator shall be notified at least 30 days prior to a sludge sampling test, so that he may at his option observe the test.

(c) Sludge shall be sampled according to paragraph (c)(1) of this section, sludge charging rate for the plant shall be determined according to paragraph (c)(2) of this section, and the sludge analysis shall be performed according to paragraph (c)(3) of this section.

(1) The sludge shall be sampled after dewatering and before incineration or drying, at a location that provides a representative sample of the sludge that is charged to the incinerator or dryer. Eight consecutive grab samples shall be obtained at intervals of between 45 and 60 minutes and thoroughly mixed into one sample. Each of the eight grab samples shall have a volume of at least 200 ml but not more than 400 ml. A total of three composite samples shall be obtained within an operating period of 24 hours. When the 24-hour operating period is not continuous, the total sampling period shall not exceed 72 hours after the first grab sample is obtained. Samples shall not be exposed to any condition that may result in mercury contamination or loss.

(2) The maximum 24-hour period sludge incineration or drying rate shall be determined by use of a flow rate measurement device that can measure the mass rate of sludge charged to the incinerator or dryer with an accuracy of ±5 percent over its operating range. Other methods of measuring sludge mass charging rates may be used if they have received prior approval by the Administrator.

(3) The handling, preparation, and analysis of sludge samples shall be accomplished according to Method 105 in Appendix B of this part.

(d) The mercury emissions shall be determined by use of the following equation:

$$E_{Hg}=1 \times 10^{-3} cQ$$

where

E_{Hg}=Mercury emissions, g/day.

c =Mercury concentration of sludge on a dry solids basis, μg/g (ppm).

Q =Sludge charging rate, kg/day.

(e) No changes in the operation of a plant shall be made after a sludge test has been conducted which would potentially increase emissions above the level determined by the most recent sludge test, until the new emission level has been estimated by calculation and the results reported to the Administrator.

(f) All sludge samples shall be analyzed for mercury content within 30 days after the sludge sample is collected. Each determination shall be reported to the Administrator by a registered letter dispatched before the close of the next business day following such determination.

(g) Records of sludge sampling, charging rate determination and other data needed to determine mercury content of wastewater treatment plant sludges shall be retained at the source and made available, for inspection by the Administrator, for a minimum of 2 years.

§ 61.55 Emission monitoring.

(a) Wastewater treatment plant sludge incineration and drying plants. All such sources for which mercury emissions exceed 1600 g/day, demonstrated either by stack sampling according to § 61.53 or sludge sampling according to § 61.54, shall monitor mercury emissions at intervals of at least once per year by use of Method 105 of Appendix B, or the procedures specified in § 61.54(c) and (d). The results of monitoring shall be reported and retained according to § 61.53(d) (5) and (6), or § 61.54(f) and (g).

15. Appendix A is revised to a new reporting format, and sections (I) (C) and (I) (D) are added as follows:

APPENDIX A

National Emission Standards for Hazardous Air Pollutants

Compliance Status Information

I. SOURCE REPORT

INSTRUCTIONS: Owners or operators of sources of hazardous pollutants subject to the National Emission Standards for Hazardous Air Pollutants are required to submit the information contained in Section I to the appropriate U.S. Environmental Protection Agency Regional Office prior to 90 days after the effective date of any standards or amendments which require the submission of such information.

A list of regional offices is provided in §61.04. ____________

A. SOURCE INFORMATION

1. Identification/Location - Indicate the name and address of each source.

1 2 Region 3 4 State 5 8 County 9 13 Source Number 0 0 0 14 16 0 0 17 18 1 19

20 22 AQCR # 23 26 City Code 27 Source Name 46

47 Street Address (Location of Plant) 66 80

Dup 1-18 19 20 City Name 34 State 35 39

40 State Regis. Number 54 55 58 NEDS X Ref.

59 SIC 62 FF 64 8 A/P 65 77 79 Staff 80

Dup 1-18 5 19 CS 30 SIP 31 EC 49 80

2. Contact - Indicate the name and telephone number of the owner or operator or other responsible official whom EPA may contact concerning this report.

Dup 1-18 4 1 19 20 21 Name 43

44 46 Area Code 47 Number 54 80

3\. Source Description - Briefly state the nature of the source (e.g., "Chlor-alkali Plant" or "Machine Shop").

Dup 1-18 4 2 19 20 21 Description 50

51 Continued 79 80

4\. Alternative Mailing Address - Indicate an alternative mailing address if correspondence is to be directed to a location different than that specified above.

Dup 1-18 4 3 19 20 21 Number Street or Box Number 45 80

Dup 1-18 4 4 19 20 21 City 35 37 38 State 41 Zip 44 80

5\. Compliance Status - The emissions from this source ___ can ___ cannot meet the emission limitations contained in the National Emission Standards on or prior to 90 days after the effective date of any standards or amendments which require the submission of such information.

Signature of Owner, Operator or Other Responsible Official

NOTE: If the emissions from the source will exceed those limits set by the National Emission Standards for Hazardous Air Pollutants, the source will be in violation and subject to Federal enforcement actions unless granted a waiver of compliance by the Administrator of the U.S. Environmental Protection Agency. The information needed for such waivers is listed in Section II of this form.

B\. PROCESS INFORMATION. Part B should be completed separately for each point of emission for each hazardous pollutant. [Sources subject to 61.22(1) may omit number 4. below.]

Dup 1-13 14 16 0 0 17 18 5 19 20 SCC 27 28 29 NEDS-X Ref 30 IS 31 SIP

1. Pollutant Emitted - Indicate the type of hazardous pollutant emitted by the process. Indicate "AB" for asbestos, "BE" for beryllium, or "HG" for mercury.

32 33
Pollutant
34 Regulation 48
49 EC

2. Process Description - Provide a brief description of each process (e.g., "hydrogen end box" in a mercury chlor-alkali plant, "grinding machine" in a beryllium machine shop). Use additional sheets if necessary.

50 Process Description 74
80

Dup 1-18 6 1
19 20 21 50
51 79 80

Dup 1-18 6 2
19 20 21 50
51 79 80

3. Amount of Pollutant - Indicate the average weight of the hazardous material named in Item 1 which enters the process in pounds per month (based on the previous twelve months of operation).

Dup 1-18 6 3
19 20
21 27
lbs./mo.
29 36 80

4. Control Devices
   a. Indicate the type of pollution control devices, if any, used to reduce the emissions from the process (e.g., venturi scrubber, baghouse, wet cyclone) and the estimated percent of the pollutant which the device removes from the process gas stream.

Dup 1-18 6 4
19 20
PRIMARY CONTROL DEVICE:
21 43

45 Primary Device Name 64
66 70
Percent Removal
Efficiency
72 79

80

Dup 1-18	6 5 19 20	21	SECONDARY CONTROL DEVICES:	45

47 Secondary Device Name 64	66 70 Percent Removal Efficiency	% EFFIC. 72 79	80	

b. Asbestos Emission Control Devices Only

i. If a baghouse is specified in Item 4a, give the following information:

The air flow permeability in cubic feet per minute per square foot of fabric area.

Air flow permeability = __________ cfm/ft^2

The pressure drop in inches water gauge across the filter at which the baghouse is operated.

Operating pressure drop = __________ inches w.g.

If the baghouse material contains synthetic fill yarn, check whether this material is / / spun / / or not spun.

If the baghouse utilizes a felted fabric, give the minimum thickness in inches and the density in ounces per square yard.

Thickness = _________ inches Density = ________ oz/yd^2

ii. If a wet collection device is specified in Item 4a, give the designed unit contacting energy in inches water gauge.

Unit contacting energy = _________ inches w.g.

C. DISPOSAL OF ASBESTOS-CONTAINING WASTES. Part C should be completed separately for each asbestos-containing waste generation operation arising from sources subject to §61.22(a), (c), (e), and (h).

Dup 1-13	14 16	0 0- 17 18	5 19	20 SCC 27	28 29 NEDS X Ref	30 CS	31 SIP
A B 32 33 Pollutant	34 Regulation 48	49 EC					

1. Waste Generation - Provide a brief description of each process that generates asbestos-containing waste (e.g. disposal of control device wastes).

50 ______ Process Description ______ 79 80

2. Asbestos Concentration - Indicate the average percentage asbestos content of these materials.

Dup 1-18 6 1 19 20 21 ______ ASBESTOS CONCENTRATION: ______ 43 45 ______ 48

% 50 80

3. Amount of Wastes. - Indicate the average weight of asbestos-containing wastes disposed of, measured in kg/day.

Dup 1-18 6 2 19 20 21 ______ 27 29 ______ kg/day ______ 34 80

4. Control Methods - Indicate the emission control methods used in all stages of waste disposal, from collection, processing, and packaging to transporting and deposition.

Dup 1-18 6 3 19 20 21 ______ Primary Control Method ______ 43

45 ______ 79 80

Dup 1-18 6 4 19 20 21 ______ 50

51 ______ 79 80

5. Waste Disposal - Indicate the type of disposal site (sanitary landfill, open, covered) or incineration site (municipal, private) where the waste is disposed of and who operates the site (company, private, municipal). State the name and location of the site (closest city or town, county, state).

Dup 1-18 6 5 19 20 21 ______ TYPE OF SITE: ______ 33 35 ______ 50

51 ______ 79 80

Dup 1-18 6 6 19 20 21 OPERATOR: 29 31 50

51 79 80

Dup 1-18 6 7 19 20 21 LOCATION: 29

31 70

71 79 80

D. WASTE DISPOSAL SITES. Part D should be completed separately for each asbestos waste disposal site subject to section 61.22(l).

Dup 1-13 14 16 0 0 17 18 5 19 20 SCC 27 28 29 NEDS X Ref 30 CS 31 SIP

A B 32 33 Pollutant 34 Regulation 48 49 EC

50 WASTE DISPOSAL SITE 68 80

1. Description - Provide a brief description of the site, including its size and configuration, and the distance to the closest city or town, closest residence, and closest primary road.

Dup 1-18 6 1 19 20 21 SITE DESCRIPTION 37 39 50

51 79 80

Dup 1-18 6 2 19 20 21 DISTANCE: 29 30 TOWN: 34 36 40 K M 42 43

45 RESIDENCE: 54 56 60 K M 62 63 65 ROAD: 69 71 75

K M 77 78 80

2. Inactivation - After the site is inactivated, indicate the method or methods used to comply with the standard and send a list of the actions that will be undertaken to maintain the inactivated site.

Dup 1-18 6 8 COMPLIANCE METHOD/INACTIVE SITE:
19 20 21 52

54 79 80

II. WAIVER REQUESTS

A. WAIVER OF COMPLIANCE. Owners or operators of sources unable to operate in compliance with the National Emission Standards for Hazardous Air Pollutants prior to 90 days after the effective date of any standards or amendments which require the submission of such information may request a waiver of compliance from the Administrator of the U.S. Environmental Protection Agency for the time period necessary to install appropriate control devices or make modifications to achieve compliance. The Administrator may grant a waiver of compliance with the standard for a period not exceeding two years from the effective date of the hazardous pollutant standards, if he finds that such period is necessary for the installation of controls and that steps will be taken during the period of the waiver to assure that the health of persons will be protected from imminent endangerment.

The report information provided in Section I must accompany this application. Applications should be sent to the appropriate EPA regional office.

1. Processes Involved - Indicate the process or processes emitting hazardous pollutants to which emission controls are to be applied.

2. Controls

   a. Describe the proposed type of control device to be added or modification to be made to the process to reduce the emissions of hazardous pollutants to an acceptable level. (Use additional sheets if necessary.)

   b. Describe the measures that will be taken during the waiver period to assure that the health of persons will be protected from imminent endangerment. (Use additional sheets if necessary.)

3. Increments of Progress - Specify the dates by which the following increments of progress will be met.

   Date by which contracts for emission control systems or process modifications will be awarded; or date by which orders will be issued for the purchase of the component parts to accomplish emission control or process modification.

Dup 1-16 0 1 7
17 19 53 54 55 60 61 MO/DY/YR 66 80

- Date of initiation of on-site construction or installation of emission control equipment or process change.

Dup 1-16 0 2 7
17 19 53 54 55 60 61 MO/DY/YR 66 80

- Date by which on-site construction or installation of emission control equipment or process modification is to be completed.

Dup 1-16 0 3 7
17 19 53 54 55 60 61 MO/DY/YR 66 80

- Date by which final compliance is to be achieved.

Dup 1-16 0 4 7
17 19 53 54 55 60 61 MO/DY/YR 66 80

B. WAIVER OF EMISSION TESTS. A waiver of emission testing may be granted to owners or operators of sources of beryllium or mercury pollutants if, in the judgment of the Administrator of the Environmental Protection Agency the emissions from the source comply with the appropriate standard or if the owners or operators of the source have requested a waiver of compliance or have been granted a waiver of compliance.

This application should accompany the report information provided in Section I.

1. Reason - State the reasons for requesting a waiver of emission testing. If the reason stated is that the emissions from the source are within the prescribed limits, documentation of this condition must be attached.

Date

Signature of the owner or operator

APPENDIX B—TEST METHODS

16. Method 105 is added to Appendix B as follows:

* * * * *

METHOD 105. METHOD FOR DETERMINATION OF MERCURY IN WASTEWATER TREATMENT PLANT SEWAGE SLUDGES

1. *Principle and applicability.* 1.1 Principle—A weighed portion of the sewage sludge sample is digested in aqua regia for 2 minutes at 95°C, followed by oxidation with potassium permanganate. Mercury in the digested sample is then measured by the conventional spectrophotometer cold vapor technique. An alternative digestion involving the use of an autoclave is described in paragraph 4.5.2 of this method.

1.2 Applicability—This method is applicable for the determination of total organic and inorganic mercury content in sewage sludges, soils, sediments, and bottom-type materials. The normal range of this method is 0.2 to 5 µg/g. The range may be extended above or below the normal range by increasing or decreasing sample size and through instrument and recorder control.

2. *Apparatus.* 2.1 Analysis—The conventional cold vapor technique(5) is used to analyze the sample.

2.1.1 Atomic Absorption Spectrophotometer[1]—Any atomic absorption unit having an open sample presentation area in which to mount the absorption cell is suitable. Instrument settings recommended by the particular manufacturer should be followed.

2.1.2 Mercury Hollow Cathode Lamp—Westinghouse WL-22847, argon filled, or equivalent.

2.1.3 Recorder—Any multirange, variable-speed recorder that is compatible with the UV detection system is suitable.

2.1.4 Absorption Cell—Standard spectrophotometer cells 10 cm long, having quartz end windows may be used. Suitable cells may be constructed from plexiglass tubing, 2.5 cm O.D. x 11.4 cm (ca. 1" O.D. x 4¼"). The ends are ground perpendicular to the longitudinal axis, and quartz windows [2.5 cm diameter x 0.16 cm thickness (ca. 1" diameter x $\frac{1}{16}$" thickness)] are cemented in place. Gas inlet and outlet ports [also of plexiglass but 0.6 cm O.D. (ca. ¼" O.D.)] are attached approximately 1.3 cm (½") from each end. The cell is strapped to a burner for support and aligned in the light beam to give the maximum transmittance. NOTE: Two 5.1 cm x 5.1 cm (ca. 2" x 2") cards with 2.5 cm (ca. 1") diameter holes may be placed over each end of the cell to assist in positioning the cell for maximum transmittance.

2.1.5 Air Pump—Any peristaltic pump capable of delivering 1 liter of air per minute may be used. A Masterflex pump with electronic speed control has been found to be satisfactory. (Regulated compressed air can be used in an open one-pass system.)

2.1.6 Flowmeter—Capable of measuring an air flow of 1 liter per minute.

2.1.7 Aeration Tubing—Tygon tubing is used for passage of the mercury vapor from the sample bottle to the absorption cell and return. Straight glass tubing terminating in a coarse porous frit is used for sparging air into the sample.

2.1.8 Drying Tube—15 cm long x 1.9 cm diameter (ca. 6" long x ¾" diameter) tube containing 20 grams of the desiccant magnesium perchlorate. The apparatus is assembled as shown in Figure 105-1. In place of the magnesium perchlorate drying tube, a small reading lamp with 60W bulb may be used to prevent condensation of moisture inside the cell. The lamp is positioned so as not to interfere with the measurement and to shine on the absorption cell maintaining the air temperature about 5°C above ambient.

3. *Reagents.* 3.1 Analysis.

3.1.1 Aqua Regia—Prepare immediately before use by carefully adding three volumes of concentrated HCl to one volume of concentrated HNO_3.

3.1.2 Sulfuric Acid, 0.5N—Dilute 14.0 ml of concentrated sulfuric acid to 1.0 liter.

3.1.3 Stannous Sulfate—Add 25 g stannous sulfate to 250 ml of 0.5N sulfuric acid. This mixture is a suspension and should be stirred continuously during use. Stannous chloride may be used in place of the stannous sulfate.

3.1.4 Sodium Chloride—Hydroxylamine Sulfate Solution—Dissolve 12 grams of sodium chloride and 12 grams of hydroxylamine sulfate in distilled water and dilute to 100 ml. Hydroxylamine hydrochloride may be used in place of the hydroxylamine sulfate.

3.1.5 Potassium Permanganate—5% solution, w/v. Dissolve 5 grams of potassium permanganate in 100 ml of distilled water.

3.1.6 Stock Mercury Solution—Dissolve 0.1354 grams of reagent grade mercuric chloride (Assay >95%) in 75 ml of distilled water. Add 10 ml of concentrated nitric acid and adjust the volume to 100.0 ml. 1 ml = 1 mg Hg.

3.1.7 Working Mercury Solution—Make successive dilutions of the stock mercury solution to obtain a working standard containing 0.1 µg per ml. This working standard and the dilutions of the stock mercury solution should be prepared fresh daily. Acidity of the working standard should be maintained at 0.15% nitric acid. This acid should be added to the flask as needed before the addition of the aliquot. Mercuric solutions should not be prepared in plastic containers.

4. *Procedures.* Samples for mercury analysis are subject to contamination from a variety of sources. Extreme care must be taken to prevent contamination. Certain interferences may occur during the analysis procedures. Extreme caution must be taken to avoid inhalation of mercury.

4.1 Sample Handling and Preservation.

4.1.1 Because of the extreme sensitivity of the analytical procedure and the omnipresence of mercury, care must be taken to avoid extraneous contamination. Sampling devices, sample containers, and reagents should be ascertained to be free of significant amounts of mercury; the sample should not be exposed to any condition in the laboratory that may result in contact or airborne mercury contamination. Sample containers to be used for collection and shipment of mercury samples should be properly cleaned before use. These should be rinsed with at least 20% v/v HNO_3 followed by distilled water.

4.1.2 While the sample may be analyzed without drying, it has been found to be more convenient to analyze a dry sample. Moisture may be driven off in a drying oven at a temperature of 60°C. No significant mercury losses have been observed by using this drying step. The dry sample should be pulverized and thoroughly mixed before the aliquot is weighed.

4.2 Interferences.

4.2.1 Interferences that may occur in sludge samples are sulfides, high copper, high chlorides, etc. A discussion of possible interferences and suggested preventative measures to be taken is given in Reference (6) (7).

4.2.2 Volatile materials which absorb at the 253.7 nm will cause a positive interfer-

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[1] Instruments designed specifically for the measurement of mercury using the cold vapor technique are commercially available and may be substituted for the atomic absorption spectrophotometer.

ence. In order to remove any interfering volatile materials, the dead air space in the BOD bottle should be purged with nitrogen before the addition of stannous sulfate.

4.3 Handling Sample Mercury Vapors After Analysis.

4.3.1 Because of the toxic nature of mercury vapor, precaution must be taken to avoid its inhalation. Therefore, a bypass should be included in the analysis system to either vent the mercury vapor into an exhaust hood or pass the vapor through some absorbing media, such as:

(a) equal volumes of 0.1N $KMNO_4$ and 10% H_2SO_4;

(b) 0.25% iodine in a 3% KI solution.

A specially treated charcoal that will absorb mercury vapor is also available from Barnebey and Cheney, E. 8th Ave. and North Cassidy St., Columbus, Ohio 43219, Catalog No. 580-13 or No. 580-22.[3]

4.4 Calibration.

4.4.1 Transfer 0, 0.5, 1.0, 2.0, 5.0 and 10 ml aliquots of the working mercury solution containing 0 to 1.0 μg of mercury to a series of 300-ml BOD bottles. Add enough distilled water to each bottle to make a total volume of 10 ml. Add 5 ml of aqua regia and heat 2 minutes in a water bath at 95°C. Allow the sample to cool and add 50 ml distilled water and 15 ml of $KMnO_4$ solution to each bottle and return to the water bath for 30 minutes. Cool and add 6 ml of sodium chloride-hydroxylamine sulfate solution to reduce the excess permanganate. Add 50 ml of distilled water. Treating each bottle individually, add 5 ml of stannous sulfate solution and immediately attach the bottle to the aeration apparatus. At this point, the sample is allowed to stand quitely without manual agitation. The circulating pump, which has previously been adjusted to a rate of 1 liter per minute, is allowed to run continuously. The absorbance, as exhibited either on the spectrophotometer or the recorder, will increase and reach maximum within 30 seconds. As soon as the recorder pen levels off, approximately 1 minute, open the bypass valve and continue the aeration until the absorbance returns to its minimum value. Close the bypass valve, remove the fritted tubing from the BOD bottle and continue the aeration. Proceed with the standards and construct a standard curve by plotting peak height versus micrograms of mercury.

4.5 Analysis.

4.5.1 Weigh triplicate 0.2g±0.001 g portions of dry sample and place in bottom of a BOD bottle. Add 5 ml of distilled water and 5 ml of aqua regia. Heat 2 minutes in a water bath at 95°C. Cool and add 50 ml distilled water and 15 ml potassium permanganate solution to each sample bottle. Mix thoroughly and place in the water bath for 30 minutes at 95°C. Cool and add 6 ml of sodium chloride-hydroxylamine sulfate to reduce the excess permanganate. Add 55 ml of distilled water. Treating each bottle individually, add 5 ml of stannous sulfate and immediately attach the bottle to the aeration apparatus. With each sample, continue as described in paragraph 4.4.1 of this method.

4.5.2 An alternative digestion procedure using an autoclave may also be used. In this method 5 ml of concentrated H_2SO_4 and 2 ml of concentrated HNO_3 are added to the 0.2 grams of sample. 5 ml of saturated $KMnO_4$ solution are added and the bottle is covered with a piece of aluminum foil. The samples are autoclaved at 121°C and 2.1 kg/cm^2 (ca. 15 psig) for 15 minutes. Cool, make up to a volume of 100 ml with distilled water, and add 6 ml of sodium chloride-hydroxylamine sulfate solution to reduce the excess permanganate. Purge the dead air space and continue as described in paragraph 4.4.1 of this method.

5. *Calculation.* 5.1 Measure the peak height of the unknown from the chart and read the mercury value from the standard curve.

5.2 Calculate the mercury concentration in the sample by the formula:

$$\mu g\ Hg/gm = \frac{\mu g\ Hg \text{ in the aliquot}}{\text{wt. of the aliquot in g}}$$

5.3 Report mercury concentrations as follows: Below 0.1 μg/g; between 0.1 and 1 μg/g, to the nearest 0.01 μg/g; between 1 and 10 μg/g, to nearest 0.1 μg; above 10 μg/g, to nearest μg.

6. *Precision and accuracy.* 6.1 According to the provisional method in reference number 5, the following standard deviations on replicate sediment samples have been recorded at the indicated levels: 0.29 μg/g±0.02 and 0.82 μg/g±0.03. Recovery of mercury at these levels, added as methyl mercuric chloride, was 97 and 94%, respectively.

7. *References.*

1. Bishop, J. N. "Mercury in Sediments," Ontario Water Resources Comm., Toronto, Ontario, Canada, 1971.

2. Salma, M. Private communication, EPA Cal/Nev Basin Office, Alameda, California.

3. Hatch, W. R., and Ott, W. L. "Determination of Sub-Microgram Quantities of Mercury by Atomic Absorption Spectrophotometry," Ana. Chem. *40*, 2085 (1968).

4. Bradenberger, H. and Bader, H. "The Determination of Nanogram Levels of Mercury in Solution by a Flameless Atomic Absorption Technique," Atomic Absorption Newsletter *6*, 101 (1967).

5. Analytical Quality Control Laboratory (AQCL), Environmental Protection Agency, Cincinnati, Ohio, "Mercury in Sediment (Cold Vapor Technique)," Provisional Method, April 1972.

6. Kopp, J. F., Longbottom, M. C. and Lobring, L. B. "Cold Vapor Method for Determining Mercury," Journal AWWA, 64, 1 (1972), pp. 20-25.

7. "Manual of Methods for Chemical Analysis of Water and Wastes," Environmental Protection Agency, EPA-625/2-74-003, pp. 118-138.

[FR Doc.75-27231 Filed 10-14-75;8:45 am]

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[3] Mention of trade names or specific products does not constitute endorsement by the Environmental Protection Agency.

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 61

[AH-FRL 2324-3]

National Emission Standards for Hazardous Air Pollutants; Standards for Radionuclides

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed Rule and Announcement of Public Hearing.

SUMMARY: On November 8, 1979, EPA listed radionuclides as a hazardous air pollutant under the provisions of Section 112 of the Clean Air Act. Pursuant to Section 112, EPA is proposing standards (including appropriate reporting requirements) for sources of emissions of radionuclides in four categories: (1) Department of Energy (DOE) Facilities, (2) Nuclear Regulatory Commission licensed facilities and non-DOE Federal facilities, (3) underground uranium mines, and (4) elemental phosphorous plants.

The Environmental Protection Agency (EPA) has identified several additional source categories that emit radionuclides and has determined there are good reasons for not proposing standards at this time for these categories. They are the following: (1) coal-fired boilers, (2) the phosphate industry, (3) other extraction industries, (4) uranium fuel cycle facilities, uranium mill tailings, management of high level waste, and (5) low energy accelerators.

DATES: Comments may be received on or before May 30, 1983.

Public Hearings. An informal public hearing will be held on April 28, 29, and 30, 1983 in Washington, D.C. The exact time and location of the hearing can be obtained by calling the Office of Radiation Programs at (703) 557-0704. Requests to participate in the informal hearing should be made by April 20, 1983. Written statements may be entered into the record before, during, or within 30 days after the hearing.

ADDRESSES: All written comments should be submitted to the Central Docket Section (A-130), U.S. Environmental Protection Agency, Washington, D.C. 20460, Attention: Docket No. A-79-11. This docket, containing information used by EPA in developing the proposed standards, is available for public inspection between 8:00 a.m. and 4:00 p.m., Monday through Friday at EPA's Central Docket Section, West Tower Lobby, Gallery One, Waterside Mall, 401 M Street SW., Washington, D.C. 20460.

Separate sections of the docket have been established for each category of radionuclide emissions to air. Comments specific to a proposed action should be addressed to the following docket sections:

Section III A—Department of Energy Facilities
Section III B—Nuclear Regulatory Commission Licensed Facilities and non-DOE Federal Facilities
Section III C—Underground Uranium Mines
Section III D—Elemental Phosphorous Plants
Section III E—Coal-fired Boilers
Section III F—Phosphate Industry
Section III G—Other Extraction Industries
Section III H—Uranium Fuel Cycle Facilites, Uranium Mill Tailings, and Management of High Level Waste
Section III I—Low Energy Accelerators

Requests to participate in the informal hearing should be made in writing to Richard J. Guimond, Director, Criteria and Standards Division (ANR-460), U.S. Environmental Protection Agency, Washington, D.C. 20460. All requests for participation should include, at least, an outline of the topics to be addressed in the opening statements and the names of the participants. Presentations should be limited to 15 minutes each.

A Background Information Document has been prepared that contains, for each source category, projected doses and risks to nearby individuals and to populations, descriptions of current control technology, and descriptions and costs of emission control technologies. Single copies of the Background Information Document for the proposed standards may be requested in writing from the Program Management Office (ANR-458), U.S. Environmental Protection Agency, Washington, D.C. 10460, or by calling (703) 557-9351.

FOR FURTHER INFORMATION CONTACT: Terrence A. McLaughlin, Chief, Environmental Standards Branch (ANR-460), U.S. Environmental Protection Agency, Washington, D.C. 20460, (703) 557-8977.

SUPPLEMENTARY INFORMATION:

I. Overview of the Proposed Standards

A. Basic Terms Used in This Notice

All matter is made up of atoms; their nuclei contain protons and neutrons. The number of protons in an atom determines the identity of the element. For example, the element with 6 protons is called carbon. Atoms can contain different numbers of neutrons. The total number of protons and neutrons in an atom is called the atomic weight.

The nuclei of atoms of chemical elements with certain atomic weights are unstable by nature. Such nuclei can disintegrate spontaneously in predictable ways and are said to be radioactive. Atoms with nuclei that disintegrate are called radionuclides. For example, carbon atoms with 8 neutrons disintegrate, whereas carbon atoms with 6 neutrons are stable. The number of disintegrations which will occur in a given amount of time is termed activity; the unit of activity is the curie. One curie equals 37,000,000,000 disintegrations per second.

Some radionuclides are found in nature; others are made in reactors and accelerators. This notice concerns facilities which handle or produce all types of naturally occurring and manmade radionuclides in a manner that results in their being released into the air.

B. Background

In 1977, Congress amended the Clean Air Act (the Act) to address airborne emissions of radioactive materials. Before 1977, these emissions had been either regulated under the Atomic Energy Act or unregulated. Section 122 of the Act required the Administrator of EPA, after providing public notice and opportunity for public hearings (provided by 44 FR 21704, April 11, 1979), to determine whether emissions of radioactive pollutants cause or contribute to air pollution that may reasonably be anticipated to endanger public health. On December 27, 1979, EPA published a **Federal Register** Notice listing radionuclides as hazardous air pollutants under Section 112 of the Act (44 FR 76738, December 27, 1979). To support this determination, EPA published the report titled *Radiological Impact Caused By Emissions of Radionuclides into Air in the United States—Preliminary Report* [EPA 520/7-79-006], Office of Radiation Programs, U.S. Environmental Protection Agency, Washington, D.C. (August 1979).

Section 122(c)(2) of the Act directed that, once EPA listed radionuclides to be regulated under the Act, EPA and the Nuclear Regulatory Commission (NRC) were to enter into an interagency agreement with respect to those facilities under NRC jurisdiction. Such a memorandum of understanding was effected on October 24, 1980, and was subsequently published in the **Federal Register** (45 FR 72980, November 3, 1980). When EPA began developing standards for Department of Energy (DOE) facilities, a similar memorandum of understanding was negotiated with DOE. This memorandum of understanding was signed in October 1982, and a copy has been placed in the Docket for public review.

On June 16, 1981, the Sierra Club filed suit in the U.S. District Court for the Northern District of California pursuant to the citizens' suit provision of the Act (Sierra Club v. Gorsuch, No. 81-2436 WTS). The suit alleged that EPA had a nondiscretionary duty to propose standards for radionuclides under Section 112 of the Act within 180 days after listing them. In March 1982, the Court granted the Sierra Club motion for partial summary judgment on the liability issue, and, on September 30, 1982, the Court ordered EPA to publish proposed regulations establishing emission standards for radionuclides, with a notice of hearing, within 180 days of the date of that order.

EPA is proposing standards for certain sources of radionuclide emissions to air and is proposing not to regulate other sources. To EPA's knowledge, these comprise all source categories that release potentially regulatable amounts of radionuclides to air. The deadline established by the Court for this rulmaking has required EPA to proceed with less information than it would like. As always, EPA invites comments and will consider them carefully to ensure that the Agency's decisions are the best possible ones.

C. Estimates of Health Risk

Agencies can never obtain perfect data but have to make regulatory decisions on the basis of the best information available. Although additional-study may be suggested to clarify the health implications from exposure to radiation at relatively low levels, EPA is concerned about the potential detrimental effects to human health caused by radiation based on the best scientific information currently available. EPA believes its estimates of doses to humans and the potential human health risks constitute an adequate basis for decisionmaking.

The information used by the Agency in estimating the hazards to health due to exposure to radiation is summarized in the following reports: *The Effects on Populations of Exposure to Low Levels of Ionizing Radiation* (1972) and *Health Effects of Alpha Emitting Particles in the Respiratory Tract* (1976) by the BEIR Committee, the report of the United Nations Scientific Committee on the Effects of Atomic Radiation entitled *Sources and Effects of Ionizing Radiation* (1977), and *Publication 26* (1977) by the International Commission on Radiological Protection. These bodies agree that high levels of radiation cause cancer and mutations and that, when formulating radiation protection standards and guidance, it is reasonable to assume that the risks of cancer and mutations are proportional to radiation dose. Background information on the risk associated with radon emissions can be found in an EPA report titled *Indoor Radiation Exposure Due to Radium-226 in Florida Phosphate Lands*, [EPA 520/4-78-013] (1978).

In concert with the recommendations of these reports, even for relatively low doses, EPA has assumed a linear, nonthreshold, dose-effect relationship as a reasonable basis for estimating the public health hazards due to exposure to radiation. This means that any radiation dose is assumed to pose some risk of damage to health and that the risk associated with low doses is directly proportional to the risk that has been demonstrated at higher doses. EPA believes this assumption is reasonable for public health protection in light of presently available information. However, EPA recognizes that the data available preclude neither a threshold for some types of damage below which there are no harmful effects nor the possibility that low doses of gamma radiation may be less harmful to people than the linear model implies.

As used in this notice, the term "dose to an individual" means an estimate of the dose rate in units of dose equivalent per year (rem/y) to the whole body or to a specified body organ due to exposure to radiation at a given level for the person's lifetime (70 years). These dose rates are a measure of, although not directly proportional to, the individual's risk of fatal cancer. The term "lifetime risk to an individual" means an estimate of the potential probability of premature death due to cancer caused by radiation exposure at a given level for the person's lifetime. There are also risks of nonfatal cancer and serious genetic effects, depending on which organs receive the exposure to radiation. The risks of nonfatal cancer and genetic effects cannot be accurately estimated, but neither risk is larger than the fatal cancer risk. EPA considers all these risks when it makes regulatory decisions on limiting emissions by restricting dose rates or exposures to radionuclide concentrations.

As used in this notice, the term "dose to population" means an estimate of the summed dose received by all persons in a population living within a given distance of the source, typically within 80 kilometers, due to a one year release of radionuclides (person-rem per year of operations). A person-rem is a total amount of exposure received by a large group equivalent to one person receiving an exposure of one rem. The term "risk to population" means an estimate of the number of potential fatal cancers that might occur in the population living within a given distance of the emission source, typically within 80 kilometers. The risk is related to the amount of radionuclides that are emitted during a year of operation. Part of the population risk is likely to occur some time after the radionuclides are emitted because: (1) There is a delay between release and exposure as the radionuclides move through environmental pathways and (2) there is a latent period between exposure and the onset of the disease. The dose to populations for a specific organ is related to, although not directly proportional to, the risks of fatal cancer, nonfatal cancer, and serious genetic effects. EPA considers all fatal and nonfatal risks in making regulatory decisions on whether standards are needed to protect the general public. As used in this notice, the term "health effect" means potential fatal cancers. Additional information on risk can be found in the Draft Background Information Document.

EPA must make numerous assumptions when estimating the radiation dose to individuals and population groups and the likely risk this might present to health. The assumptions introduce uncertainties in the estimates of radiation doses and health risks. All individual risk calculations assume that individuals reside at a single location for a 70 year life and are exposed to a constant source of radionuclide emissions for the entire time. factors such as radionuclide uptake by vegetation, consumption of locally produced crops and milk, and meteorology are quite site specific and can influence the actual risk to any given individual. Individual characteristics such as age, physiology, physical activity level, amount of time spent indoors, and eating habits can influence the rate and amount of radionuclides affecting the individual and, thus, the risk of that person.

EPA's risk estimates are "best estimates" considering the above factors. EPA believes that the estimates are within a factor of ten of the actual health risks to individuals if the assumptions are valid for the particular situation under consideration.

D. Summary of the Proposed Standards

EPA is proposing specific standards for sources in four categories: (1) DOE facilities, (2) NRC-licensed facilities and non-DOE Federal facilities, (3) underground uranium mines and (4) elemental phosphorous plants.

An indirect emission standard is proposed for all DOE facilities that will restrict emissions from each site to the amount that would cause an annual dose equivalent to 10 millirem (mrem) to the whole body and 30 mrem to any organ of any individual. This emission standard will keep the radiation doses relatively low both to nearby individuals and to populations living around the sites. In addition, EPA expects these facilities to continue to comply with the current Federal Guidance requirement that emissions be limited to as low as practicable levels and has proposed a reporting requirement to describe emission control technology.

An indirect emission standard is proposed for NRC licensees and non-DOE Federal facilities that will restrict emissions from each site to the amount that would cause an annual dose equivalent of 10 mrem to any organ of any individual. This emission standard will keep radiation doses relatively low to nearby individuals and populations in the vicinity of the site. The term "NRC licensees" includes those facilities licensed by the NRC and by States under agreement with the NRC.

An indirect emission standard is proposed for underground uranium mines that will restrict the increase in annual average concentration of radon-222 at places people can live to 0.2 picocurie per liter (pCi/1). A person living in a house for a long time in an area exposed to this concentration might still be subject to a significant estimated level of risk. However, neither control technology nor other methods to reduce radon emissions from these mines are available at reasonable cost; thus, more restrictive controls are not reasonable. The proposed standard will reduce risk to people living closest to the mines; protection of the health of regional and more distant populations is of less concern because most mines are located in remote areas.

An emission standard is proposed for elemental phosphorous plants that will limit annual emissions of polonium-210 from each site to 1 curie. While other radionuclides are emitted from these plants, polonium-210 is the major contributor to the maximum individual risk. Limiting polonium-210 will control the others. Such a standard will keep radiation doses relatively low to both individuals and populations.

While one of the above standards limits stack emissions directly, the other three limit stack emissions indirectly by specifying dose or concentration limits to be achieved. EPA believes this is a reasonable approach, given the extreme diversity of DOE facilities and NRC licensees and the fact that randon-222 emissions from uranium mines are not amenable to controls. The form of the proposed standards follows well developed and widely accepted practices in radiation protection. The use of procedures developed primarily to control chemicals would, in this context, be unworkable.

E. Basis for the Proposed Standards

In the Federal Register of May 18, 1960, President Eisenhower directed Federal agencies to follow the Radiation Protection Guidance of the Federal Radiation Council (FRC). When EPA was established, the Federal Radiation Council was abolished, and its responsibilities were transferred to EPA. EPA has considered this Guidance in establishing emission standards under Section 112 of the Clean Air Act, and the Agency's approach is compatible with it. For the purposes of this rulemaking, key elements of the Guidance are:

1. There should not be any man-made radiation exposure without the expectation of benefit resulting from such exposure.
2. The term "Radiation Protection Guide" should be adopted for Federal use. This term is defined as the radiation dose which should not be exceeded without careful consideration of the reasons for doing so; every effort should be made to encourage the maintenance of radiation doses as far below this guide as practicable.
3. For the individual in the population, the basic Radiation Protection Guide for annual whole body dose in 0.5 rem. This Guide applies when the individual whole body doses are known. As an operational technique, where the individual whole body doses are not known, a suitable sample of the exposed population should be developed whose Protection Guide for annual whole body dose will be 0.17 rem per capita per year.
4. There can be no single permissible or acceptable level of exposure without regard to the reason for permitting the exposure. It should be general practice to reduce exposure to radiation, and positive efforts should be carried out to fulfill the sense of these recommendations. It is basic that exposure to radiation should result from a real determination of its necessity.
5. There can be different Radiation Protection Guides with different numerical values, depending upon the circumstances.
6. The Federal agencies shall apply these Radiation Protection Guides with judgment and discretion to assure that reasonable probability is achieved in the attainment of the desired goal of protecting man from the undesirable effects of radiation. The Radiation Protection Guides provide a general framework for the radiation protection requirements. It is expected that each Federal agency, by virtue of its immediate knowledge of its operating problems, will use these Guides as a basis upon which to develop detailed standards tailored to meet its particular requirements.

EPA believes that the following points in these guides are of particular importance: (1) There should be benefits from exposure to radiation; (2) Exposures should be kept as low as practicable; and (3) It is appropriate to have different standards with different values, depending on the circumstances.

These Guides apply to Federal agencies to the extent that they are not incompatible with more specific legislative directives. The Clean Air Act directs EPA to establish emission standards for hazardous pollutants and directs EPA to propose these standards at a level which, in the Administrator's judgment, will protect the public health with an ample margin of safety. Congress did not describe the degree of protection that provides an ample margin of safety, nor did it describe what factors the Administrator should consider in making these judgments. Therefore, EPA considers those factors it believes are necessary to make reasonable judgments on whether standards are needed and, if so, at what level they should be established.

If a hazardous pollutant under review has been shown to possess a threshold level below which no deterimental health effects are likely, it might be relatively easy to establish an emission standard. For example, the Agency might select an appropriate safety factor, divide the threshold level by this factor, and establish an emission standard that corresponds to the reduced level. This regulatory strategy would provide reasonable assurance that no detrimental effects would result from exposure to the hazardous pollutant.

This approach is not feasible or reasonable for radionuclides. This is because the risk of cancer from exposure to radiation has not been shown to have a threshold level. Consequently, if EPA applied the approach previously described, the Agency would likely conclude that the standard should be established at zero emissions. They only way to meet such a standard would be to close all facilities emitting radionuclides because it is impossible to reduce radionuclide emissions to zero through control technology. If this approach were adopted, society would be harmed greatly since it would have to forgo the benefits of industries that emit radionuclides. Therefore, to allow society to continue to benefit from these activities, EPA must establish emission standards for radionuclides at a level that may present some human health risk. The Agency is not aware of any single level of risk that would be generally acceptable or consititute an ample margin of health protection. Some argue that an increase in cancer risk not exceeding one in 1000 due to a specific cause is acceptable, whereas others argue that an increase in risk of one in one million is unacceptable. EPA believes it should adopt an approach that will allow those various factors that influence society's health and well being to be weighed in assessing each source category. To accomplish this, EPA has decided to consider the following factors in making its judgments:

1. The radiation dose and risk to nearby individuals;
2. The cumulative radiation dose and risk to populations in the vicinity of the source;
3. The potential for radiation emissions and risk to increase in the future;
4. The availability, practicality, and cost of control technology to reduce emissions; and
5. The effect of current standards under the Act or other applicable legislative authorities.

By considering these factors, EPA will be able to provide public health protection that is consistent with the intent of the Federal Radiation Protection Guides and Clean Air Act.

The first three factors are used to assess the likely impact of emissions on the health of individuals and large populations and to estimate the potential for significant emissions in the future. The fourth factor enables EPA to assess whether state-of-the-art control technologies are currently in use and whether there are any practical means of reducing emissions through control technology or other control strategies. The last factor allows EPA to assess whether regulations or standards that have been established to control particulates or other pollutants are also minimizing releases of radionuclides.

The dose and risk to the individuals nearest a site are often the primary considerations when evaluating the need to control emissions of radionuclides. Controlling maximum individual dose assures that people living nearest a source are not subjected to unreasonably high risk. Further, protecting individuals usually provides an adequate level of protection to populations living further away from the source. Estimating the maximum individual dose and risk allows a comparison of the potential impact of one source to other sources.

EPA believes that cumulative population dose and risk also need to be examined. The cumulative radiation dose and risk to surrounding populations are determined by adding together all of the individual doses and risks that everyone within a certain radius (usually 80 km) of an emission source receives. This factor can sometimes be more important than the maximum individual risk in deciding whether controls are needed, particularly if an extremely large population may be exposed. The aggregate dose and population risk can be of such magnitude that it would be reasonable to require a reduction in the total risk even though, if the maximum individual dose were considered alone, one might conclude that no further controls are needed.

In addition, EPA believes that the potential for emissions and risk to increase in the future needs to be considered even though the current projected maximum individual and population risks are very low. An emission standard might be appropriate because the facilities now, or may in the future, handle large quantities of radionuclides that could escape into the air if improperly controlled. Alternatively, when the amount handled by a facility is small or is decreasing, and there is no potential for large releases now or in the future, standards may not be needed.

The availability and practicality of control technology are important in judging how much control of emissions is warranted. For this rulemaking, EPA believes that the standard should be established at a level that will require best available technology with allowance for variation in emissions, once a determination is made that additional controls are necessary. Additional actions, such as requiring development of new technology, closure of a facility, or other extreme measures may be considered if significant emissions remain after best available technology is in place or if there are significant emissions and there is no applicable control technology. EPA is defining best available technology as that which, in the judgment of the Administrator, is the most advanced level of controls adequately demonstrated, considering economic, energy, and environmental impacts. The technological and economic impacts associated with retrofits are considered when determining best available technology for existing sources.

Finally, EPA believes it is reasonable to consider whether other EPA standards are achieving approximately the same goal as the Act, i.e., protecting public health with an ample margin of safety. In cases where other standards are providing comparable control for radionuclides, EPA believes it is appropriate not to propose redundant standards under the Act. There would be no benefits because the public health would already be protected with an ample margin of safety, but there could be unnecessary costs associated with implementing an additional standard.

EPA considered each of the relevant factors in making determinations for each source category that was reviewed. These factors were not quantitatively balanced through the use of formulas to derive emission limits. Rather, they were qualitatively weighed before deciding whether a standard was needed and, if so, what level of control was suitable. The consideration of these factors as they apply to each source category is detailed in the portion of this preamble devoted to that source category.

EPA requests comments on the appropriateness of the factors it has selected for consideration. Should some factors be added or deleted? Should more emphasis be placed on some factors than others? How should the cost-effectiveness, cost-benefits, or affordability of controls be considered when establishing appropriate emission standards to provide an ample margin of safety? EPA also requests comments on whether the factors were appropriately applied to the nine source categories that were reviewed.

It is the intent of the Act that control technology or operational practices be used to control emissions. Buying land to expand the size of the site or building higher stacks to reduce exposure to nearby individuals may not be used where other emission control devices or operational procedures are reasonably available. However, there are radionuclides, principally radon, which present significant risks and for which emission controls may not always be reasonably available. As a last resort in such cases, EPA has decided to propose standards achievable through dispersion techniques.

II. Department of Energy Facilities (DOE)

A. General Description

DOE administers many facilities that emit radionuclides to air. These facilities are Government owned but are managed and operated for DOE by private contractors. Operations at these facilities include research and development, production and testing of nuclear weapons, enrichment of uranium and production of plutonium and other fissile materials for nuclear weapons, reactors, and other purposes, and processing, storing, and disposing of radioactive wastes. These facilities are on large sites, some of which cover hundreds of square miles in mostly remote locations, and are located in about 20 different states. Some of the smaller facilities resemble typical industrial sites and are located in suburban areas.

Each facility differs in emission rates, site size, nearby population densities, and other parameters that directly affect the dose from radionuclide emissions. Many different kinds of radionuclides are emitted to air. Six sites have multipurpose operations spread over very large areas. About a dozen sites are primarily research and development facilities, located in more populated areas. Reactor and accelerator operations at these sites may release radioactive noble gases and tritium; other operations may release small amounts of other radionuclides. Several facilities are primarily engaged in weapons development and production and may release small amounts of tritium and cretain long-lived radionuclides. Finally, two sites are dedicated entirely to gaseous diffusion plants that enrich uranium for use in utility electric power reactors and for defense purposes. They primarily emit uranium.

B. Estimates of Dose and Risk

At 15 of the 25 DOE facilities, which are considered as a group in the Background Information Document because of their relatively small health impact, the doses to the nearby individuals ar estimated to be considerably less than 1 millirem per year (mrem/y). The collective dose to the populations living around the sites is also low, no higher than about 10 person-rem as the result of 1 year of site operation. The health risk associated with this group is correspondingly low. The maximum lifetime risk to the most exposed individual is estimated to be less than 10 in 1,000,000 and the impact on the population is estimated to be less than 1 potential health effect per 100 years of operation. These estimates were developed using methods and assumptions discussed in Unit I.C. of this notice.

A second group of 13 facilities, those with the largest emissions of radionuclides, were studied in more detail. They included the following major sites: Argonne National Laboratory, Brookhaven National Laboratory, Feed Materials Production Center, Fermi National Accelerator Laboratory, Hanford Reservation, Idaho National Engineering Laboratory, Lawrence Livermore Laboratory, Los Alamos National Laboratory, Oak Ridge Reservation, Paducah Gaseous Diffusion Plant, Portsmouth Gaseous Diffusion Plant, Rocky Flats Plant, and the Savannah River Plant.

The highest doses to individuals are projected for Los Alamos national Laboratory (about 9 mrem/y to all organs), Oak Ridge Reservation (about 50 mrem/y to lung and 8 mrem/y to the bone) the Paducah Gaseous Diffusion Plant (about 7 mrem/y to bone and 5 mrem/y to the lung), the Portsmouth Gaseous Diffusion Plant (about 11 mrem/y to bone, 7 mrem/y to lung and 2 mrem/y to thyroid), Feed Materials Production Center (about 88 mrem/y to lung and 26 mrem/y to bone), and Savannah River Plant (about 2 mrem/y to most organs and 5 mrem/y to the thyroid). The corresponding doses to large populations ranged up to about 200 person-rem to the lung per year of site operations. The corresponding maximum lifetime risk to the most exposed individual is estimated to be less than about 2 in 10,000, while the total risk to populations surrounding all 13 sites is estimated to be less than 1 potential health effect per 15 years of operation.

All risk estimates for DOE facilities were developed using methods and assumption discussed in Unit I.C. of this notice. It is important to recognize that the actual risk to specific individuals may differ greatly from these estimates because the circumstances involving the actual exposure may differ significantly from the assumptions used to make the estimates.

C. Emission Control Technology

Emissions from DOE facilities are, in general well controlled as part of a long-standing DOE program of systematically upgrading emission controls when practical. High-efficiency filters, usually in series when large amounts of radionuclides are processed, are used to control particulate emissions. At some facilities, there are processes that discharge radioactive noble gases and tritium mixed with large volumes of air. For these cases, control technologies to remove the boble gases and tritium are usually not feasible.

At the Oak Ridge site, the highest doses to nearby individuals are mostly caused by uranium-234 and uranium-238 emissions from the Y-12 plant, a facility that has fabrication operations using enriched uranium. Particulate emissions from this facility are controlled by scrubbers, prefilters, cloth bag filters, or high-efficiency particulate filters. At the Feed Materials Production Center, the highest projected doses to nearby individuals are due to emissions of uranium-234 and uranium-238 from fabrication operations using uranium. There is also high exposure to radon decay products due to wastes containing radium-226 that are stored on this site. Particulate emissions are controlled by cloth bag filters or scrubbers but can be reduced further by additional high-efficiency filters or improved scrubbers. Waste tanks can be sealed to prevent the escape of radon.

D. The Proposed Standard

EPA is proposing that emissions of radionuclides from DOE facilities be restricted to the amount that would cause a dose equivalent rate of 10 mrem/y to the whole body and 30 mrem/y to any organ of any individual living nearby. For most practical purposes, compliance with this standard would be determined by calculating the doese to persons assumed to be living at the site boundary.

Consistent with the principles embodied in Federal Radiation Guidance to keep exposure to radiation as low as practical, it is EPA's intent that facilities subject to the DOE standard shall use best available technology even if compliance is possible with a lesser degree of control. This means that operators should periodically evaluate radionuclide emissions to air and reduce them to as low a level below the standard as is reasonably possible. This also means that the facilities now well controlled to levels considerably below the proposed standard should not relax their emission controls and that new facilities should use best available emission controls.

To determine if the standard is being implemented in a manner that keeps exposure as low as practicable, EPA is proposing a reporting requirement. DOE shall submit to EPA a concise annual report which includes the results of monitoring emissions, dose calculations, and discussions of DOE's programs for maintaining airborne releases of radionuclides as low as practicable. Much of this information is currently being collected; for example, emission data are reported by DOE's effluent information systems and annual site reports describe recent and planned improvements in emission controls. Therefore, EPA believes the burden of this reporting is reasonable. This information will be reviewed by EPA in carrying out its compliance responsibilities.

The proposed emission standards of 10 mrem/y whole body and 30 mrem/y to any organ were selected by considering highest existing emissions from those major DOE facilities where best available technology is used and considering the level to which emissions would be reduced by applying additional controls to other facilities. Uniform standards for DOE facilities could not be set lower than these values because emissions from some major DOE facilities cannot, as a practical matter, be reduced further without closing major operations at the facilities. These DOE facilities provide substantial benefits in the areas of electrical power generation and national defense. The consequence of a more restrictive standard would be to eliminate some of these beneficial activities. Consequently, the risks associated with the proposed standard are not unreasonable. Those few DOE facilities, tending to have emissions greater than this proposed limit can, in EPA's judgment, reduce their emissions using available technology or work practices. EPA believes that the proposed standard would be met if the following plants upgraded their control technology: (1) Oak Ridge Y-12 plant ($10 million capital costs) (2) Feed Materials Production Center ($15 million capital costs).

The dose allowed by the proposed standard is a factor of 50 lower than the current upper limits now used by DOE. These current upper limits are based on the 1960 recommendations of the Federal Radiation Council, although the Federal Radiation Council admonished Federal agencies to establish standards that would reduce emissions to as low as practical below the upper limits. Actual public exposure to radiation due to releases from DOE facilities has been far below the 1960 Federal Guidance levels because of the DOE practice of limiting emissions to as low as practicable levels. Since the proposed standard is much more restrictive than the 1960 guidance, it will limit radiation doses to low levels. In practice, EPA expects that most DOE facilities will operate well below the proposed standard.

EPA estimates the actual lifetime individual risk associated with the proposed standard to be at the most about 2 in 50,000 when facilities are complying with the standard. EPA believes that the proposed standard and the reporting requirement will protect the public living around DOE facilities with an ample margin of safety. The uncertainty associated with estimates of radiation does and risk is discussed in Unit I.C. and II.B of this notice.

EPA requests comments on the proposed values and the methodology used in arriving at them.

E. Alternatives to the Proposed Standard

EPA considered proposing emission limits in units of curies per year (Ci/y) for each radionuclide, with secondary corrections for particle size, lung clearance class, and other such factors. This approach was rejected because it would require very detailed and complex emission limits for each DOE facility to be as protective of public health as the proposed standard. In EPA's judgment, this would be so complex and difficult as to be infeasible.

The Agency considered proposing higher values than the proposed dose limit. We believe that many of these facilities are achieving the proposed standard at current operating levels. For the few cases where additional controls are needed to meet the standard, the technology appears available and effective and is not unreasonably expensive to purchase or operate. The protection offered by the proposed standard appears achievable, and we have not identified any good reason for accepting a lesser degree of protection.

Lower values were considered. Such limits, would be extremely costly or could force the closure of major operations of benefit to the country, possibly at several sites. The possible small additional reduction of dose and risk to a few individuals is not sufficient to justify such severe action.

Emission limits that would control dose to the general population rather than individuals were considered. In particular, EPA considered emission limits for long-half-life radionuclides such as tritium, carbon-14, krypton-85, and iodine-129. These kinds of radionuclides may cause population doses that are more significant than the doses these radionuclides cause to nearby individuals. EPA decided not to propose this kind of standard. For DOE facilities, population doses from these radionuclides are small; the highest of these small doses are caused by emissions of tritium for which control technologies are not effective. Consequently, proposing emission standards for long-half-life radionuclides at existing DOE facilities would not serve a useful purpose.

Different emission limits were considered for existing and new DOE facilities and for specific groups of DOE facilities, rather than setting uniform standards for all DOE facilities. Such a strategy would permit more restrictive standards for certain DOE facilities, although not for all of them, at the cost of having to develop a much more complex standard. Rather than do this, EPA will rely on existing Federal Guidance to all Federal agencies to ensure that exposures are kept as far below the proposed standard as practicable and has added a reporting requirement to this end. This should provide, in practice, the same measure of emission control. EPA requests comments on the desirability of setting separate standards for different categories of DOE facilities.

EPA considered the alternative of proposing the standard in the form of a risk-equivalent, whole-body dose, using methodology similar to that recently recommended by the International Commission on Radiation Protection. The principal advantage is one of equity; that is, the emissions from each facility are limited on the basis of causing equivalent levels of risk. A disadvantage of this alternative is that the proposed standard would have to be reduced from 10 mrem/y to about 5 mrem/y to maintain a comparable degree of protection with the 30 mrem/y limit to any organ. Some sources could not meet such a standard using currently available technology. The Agency particularly requests comment on the use of the whole-body, risk-equivalent dose method as an approach to selecting emission standards.

EPA considered requiring the proposed standard to be met at a site boundary in all cases, even if there are good reasons why people are not likely to be at that location, but decided not to because this would be unrealistic. EPA requests comments on where the standard should apply.

F. Implementation of the Proposed Standards

The standards will be implemented by DOE pursuant to the Memorandum of Understanding between EPA and DOE. EPA will provide oversight to ensure that implementation procedures are appropriate. The standard should be implemented using pathway and dose calculations based on EPA's codes or, alternatively, on modeling techniques which, in EPA's judgment, are as suitable for particular applications as the EPA codes.

II. NRC Licensed Facilities and Non-DOE Federal Facilities

A. General Description

This category of facilities encompasses a wide range of activities including research and test reactors, shipyards, the radiopharmaceutical industry, and other industrial facilities. For purposes of this proposed rule, EPA excludes facilities that are part of the uranium fuel cycle. The category includes both facilities licensed by NRC and facilities licensed by a State under an agreement with NRC. These facilities number in the tens of thousands and are located in all 50 states. The principal differences among these various types of activities are their emission characteristics and rates, their sizes, and the population densities of the surrounding areas. The following discussion provides illustrative examples.

There are a wide variety of designs of research and test reactors, and they operate over a range of power levels from near zero to approximately 10 megawatts. They emit primarily argon-41 and tritium at rates ranging from less than 1 Ci/y of each radionuclide up to several thousand Ci/y of argon-41 and several hundred Ci/y of tritium. They are most often located at or near universities.

The radiopharmaceutical industry currently produces about 65 different radioncul‌ides for a variety of uses in hospitals and clinics. In most cases, emissions of iodine-125 and iodine-131 cause the highest organ (thyroid) doses to nearby individuals because: (1) They are emitted in the largest quantities, (2) environmental pathways bring them into contact with man, and (3) the thyroid concentrates iodine. Emissions occur at radiopharmaceutical manufacturing sites, hospitals, and sewage treatment plants receiving hospital wastewater.

There are many other industrial uses of a number of different radionuclides that result in emissions to air, including the manufacture of industrial gauges, static eliminators, radiographic devices, and certain commercial products (e.g., self-illuminating watches and smoke detectors). Most of the industrial uses of radionuclides involve production of sealed (encapsulated) sources. Once their manufacture is completed, these sealed sources do not emit radionuclides.

B. Estimates of Dose and Risk

The vast majority of NRC licensed facilities and non-DOE Federal facilities emit relatively small quantities of radionuclides, which cause correspondingly low doses to people living nearby. Most such facilities cause maximum radiation doses of less than 1 mrem/y; the total dose to the population living around a site rarely exceeds 1 or 2 person-rem per year of operations. The maximum corresponding lifetime risks of such exposures are estimated to be less than 1 in 50,000 for the individuals receiving the highest doses, and the total risk to the population surrounding a typical facility should be less than about 1 health effect per 500 years of operation.

These estimates were developed by using methods and assumptions discussed in Unit I.C. of this notice. It is important to recognize that the actual risk to specific individuals may differ greatly from these estimates because the circumstances involving the actual exposure may differ significantly from the assumptions used to make the estimates.

C. Control Technology

Some NRC-licensed facilities emit argon-41 and tritium mixed with large volumes of air. For this type of facility, virtually all of the dose is caused by argon-41. Demonstrated treatment technology to reduce argon-41 emissions is not available because argon is a noble gas and cannot be filtered or easily trapped. However, design features, operating procedures, and equipment maintenance can be used to minimize formation of argon-41 in these reactors. For example, since air contains a small percentage of argon-40, areas in which air is exposed to neutrons generated by the reactor are sources of argon-41 when argon-40 absorbs a neutron during reactor operation. In some situations, these areas can be purged with an inert gas to reduce the amount of argon-40 available before starting up the reactor. In other cases, sealing air leaks will reduce the amount of argon-41 that would be produced.

Most facilities emitting dust to which radionuclides are attached use conventional particulate removal technology, such as fabric filters, electrostatic precipitators, scrubbers, or high-efficiency particulate air filters.

D. The Proposed Standards

EPA is proposing that emissions of radionuclides from NRC-licensed facilities and non-DOE Federal facilities be limited to that amount that would cause a dose equivalent of 10 mrem/y to any organ of any individual living nearby. Uranium fuel cycle facilities and all particle accelerators are specifically not covered by this standard for reasons discussed Unit VII of this notice.

In proposing this standard, EPA examined emission levels from facilities in this category and estimated the dose these emissions cause for people living nearby. The highest doses are caused by research and test reactors emitting principally argon-41. The dose associated with the operation of these facilities is low and cannot be significantly reduced without major redesign and and reengineering of these facilities. Therefore, EPA has decided to proposed a standard at a level that can be met by existing facilities if they continue to use good management and operational controls to limit their emissions.

EPA believes that the proposed standard protects public health with an ample margin of safety. EPA estimates the risk associated with the proposed standard to be the same as for current practice for the individual receiving the highest dose. The uncertainty associated with estimates of risk is discussed in Units. I.C. and III. B. of this notice.

EPA requests comments on the proposed standards and the methodology used in deriving it.

E. Alternatives to the Proposed Standard

The Agency considered higher and lower dose limits than the one being proposed. Higher values were rejected because the proposed standard is currently being met by all facilities in this group. A lower limit was rejected because the dose associated with these emissions is very low and EPA does not believe it is reasonable to set a lower standard and force these facilities to close or reduce their hours of operations.

EPA considered not proposing a standard for this category of facility because the dose from the operations is generally very low. The Agency rejected this alternative because of the potential impact of new facilities or modifications to existing facilities; a standard will ensure that no facilities will emit radionuclides at unreasonably high levels.

EPA also considered requiring that these facilities submit reports documenting that their emissions are as low as practicable, as is being proposed for DOE facilities. Such a requirement would impose a very large paperwork burden on government and industry. Facilities in this category number in the tens of thousands. For EPA to implement such a requirement for this category would require monitoring and reporting by thousands of facilities and e substantial effort on the part of NRC or EPA to review the reports. This considerable effort would help ensure that emissions remain very low. However, because the risk associated with the proposed standard is already low. EPA does not believe the paperwork burden on government and industry is justified. Furthermore, EPA expects that facilities in this category will, in practice, keep emission levels as low as practicable, both to ensure compliance with the proposed standard and as a matter of good radiation protection principles when dealing with hazardous materials.

F. Implementation of the Proposed Standards

For NRC licensed facilities, NRC will implement the standards subject to EPA oversight to ensure there is compliance with the standard, as is specified in a Memorandum of Understanding between EPA and NRC (45 FR 72980). Implementation will follow the established NRC practice, which is based on a review of control measures used by licensees and their effectiveness as determined by generic assessments.

For non-DOE Federal facilities, EPA will ensure compliance with the standards. EPA's implementation will use the models AIRDOS-EPA and RADRISK to perform pathway analysis and to calculate dose equivalents.

IV. Underground Uranium Mines

A. General Description

Uranium mining involves the handling of large quantities of ore containing uranium-238 and its decay products. The concentrations of these radionuclides in ore may be up to 1,000 times their concentration in other rocks and soils. After mining, the ore is shipped to a uranium mill where the uranium is separated for subsequent use in nuclear power reactors.

Uranium mining is generally carried out by either surface (open pit) or underground mining methods, depending on the depth of the ore deposit. In 1981, there were 167 underground mines and 50 open pit mines in operation in the United States. These mines accounted for about 80 percent of the uranium produced in this country.

All uranium mining in the United States now takes place in western States. In general, the mines are located in relatively remote, low population areas. In 1981, about 70 percent of domestic uranium ore production took place in New Mexico, Wyoming, and Texas.

EPA has evaluated radionuclide emissions from uranium mining activities. These evaluations show that radon-222 is the most significant radionuclide emitted to air. Radon-222 is released to air from underground mines in relatively high concentration through a series of ventilation shafts installed at appropriate locations along the mine haulage ways. These ventilation shafts provide sufficient air exchange in the working areas of the mine to keep the miners' exposures to radon decay products below the permissible limits. A recent study of 27 underground mines showed that radon-222 emissions to air from individual vents ranged from 2 to 9,000 Ci/y with an average of 900 Ci/y. The number of vents per mine ranged from 2 to 15 with an average of 6 vents per mine. The radon-222 released through these ventilation shafts can cause significant increases in the radon-222 concentration in ambient air in the vicinity of the mine vents.

EPA's evaluation of releases of radon-222 from uranium mines shows that radon-222 is released from surface mines in considerably smaller quantities and in more dilute concentrations than from underground mines. Therefore, radon-222 emissions from surface mines causes only small increases in the radon-222 concentrations in ambient air near the mines and concerns for the health of people near uranium mines is greatest for people living near underground mines.

B. Estimates of Exposure and Risk

Individuals living near underground uranium mines can be exposed to high levels of radon-222. This exposure generally occurs in structures built around the mines. Radon-222 enters the building and decays into other radionuclides which become attached to dust particles in the air. The concentration of these radionuclides build up in the air within the structures. EPA estimated the potential detriment to human health because of radon-222 emissions from uranium mines using the general assumptions discussed in Unit I.C. of this notice. It is important to recognize that the actual risk to individuals may differ greatly from these estimates because the circumstances involving the exposure may differ significantly from the assumptions used to make the estimates. Further, people need to be occupying a structure and not just standing outdoors for these estimates to be applicable.

It is estimated that an individual living 500 meters in the predominant wind direction from a large underground uranium mine will be exposed to a radon-222 concentration of 1 to 2 picocuries per liter (pCi/1) above background. Continuous exposure to *indoor* radon decay product concentrations (0.007–0.014 working level (WL)) produced by this radon-222 level might result in an increased lifetime risk of 1 to 2 in 100, although in areas where there are many mine vents clustered relatively close together, the risks could be as high as an order of magnitude greater. (A working level is a unit used to measure exposure to radon decay products).

Collective exposures for populations living near uranium mines are relatively low because these mines generally are located in low population areas. For example, the population risk due to radon-222 emissions from a large underground mine is estimated to be extremely small (about 1 health effect per 30 years of operation of the mine). Consequently, for underground uranium mines, the exposure to the general population is of considerably less public health concern than the exposure for the people that live very close to the mine vents.

C. Control Technology

There are no radon-222 emission control systems now in use in underground uranium mines. However, several methods for reducing the radon-222 concentration in mine air are available and have been used or tested for controlling radon-222 decay product concentrations in the mine itself. These methods, which primarily involve preventing radon-222 from entering the mine air through the use of sealants on the mine walls, bulkheading or backfilling the mined-out stopes, and mine pressurization can also reduce the radon-222 emissions to the outside air. EPA has carried out engineering evaluations of the cost and effectiveness of some of these methods in a hypothetical mine. These evaluations showed that such control methods would be relatively costly and not very effective. The study predicted radon-222 emission reductions from 14 to 49 percent at costs from $0.30 to $4.70 dollars per ton of ore mined.

Based on available information, EPA has concluded that no practical technology now exists for achieving satisfactory reductions in radon-222 emissions to air from underground uranium mines. The most effective procedure for limiting exposure to individuals is to provide for greater dispersion of the released radon-222. The Act indicates a preference for avoiding this type of control action to reduce health risks. However, in this situation, traditional emission control methods do not appear to be sufficiently effective in reducing the human health risks posed by release of radon-222 from underground uranium mine vents.

D. The Proposed Standard

EPA is proposing a standard that will limit the annual average radon-222 concentration in air due to emissions from an underground mine to 0.2 pCi/1 above background in any unrestricted area. An unrestricted area is defined to be any area not under the control of the mine owner or a government agency. Under this proposed standard, for a typical, large underground mine using the modeling assumptions previously described, we estimate the lifetime risk to an individual will be on the order of about 1 in 500. For a case in which many mines are located close together, studies which estimate the hazard based on a lifetime exposure show that the potential risks would be higher. However, uranium mines have a limited useful lifetime, usually 5 to 15 years, which limits the period when radon-222 would be released. Further, several other assumptions used in these studies, such as the period of occupancy of the structure, are likely to be less severe in real cases. These factors are expected to make the actual remaining risk to individuals less than 1 in 500, possibly by one or two orders of magnitude, depending on the specific circumstances.

EPA chose a standard of 0.2 pCi/1 because higher values did not provide sufficient protection of public health, particularly when many mines are located close together. Values lower than the proposed standard were judged to be impractical because of the cost and difficulty in controlling additional land and the expense associated with other control measures compared to their effectivenss. EPA believes that the risks associated with the proposed standard are not unreasonable in comparison to the cost of additional control.

The standard can be met by one of the following procedures: (1) Reducing the percentage of time the mine operates, (2) increasing the effective height of the release, and (3) controlling additional land. EPA expects that the least expensive way to meet the standard is for the the mine operator to control the land around the mine so that people do not live in houses on the land. EPA believes that, on the average, compliance with the proposed standard can be achieved by controlling land within 2 kilometers of the mine vents. The cost to meet the standard by purchasing surrounding land and structures is estimated to be about 4 million dollars per year. This estimate was determined from an evaluation of the cost to control land within 2 kilometers of 29 large mines representing about 90% of the underground uranium mine or production

Based on 1981 production values, this cost represents a $0.30 per pound increase in the cost of producing uranium. This represents a 1% increase in production costs. Although the costs for the smaller mines accounting for the remaining ore production are not included in the estimate, these costs will be relatively small because the radon-222 emissions from these mines are expected to be small.

Owners and operators of underground uranium mines will be required to keep records of radon-222 emissions and radon-222 concentration projections consistent with other actions under the Act.

EPA requests comments on the proposed concentration limit of 0.2 pCi/1. EPA believes that the proposed standard is the most practical and effective way to limit the potential risk to individuals due to radon-222 emissions from underground uranium mines.

E. Alternative Standards

The development of standards for uranium mines is more difficult and complicated than for other sources emitting radionuclides into air. Therefore, the Agency requests public comment on other possible options for standards. In particular, comments are requested on appropriate limits, cost, feasibility, and significance for public health for the following options:

Option 1: Land Control Standard. This type of standard would establish an exclusion area of fixed distance from a mine vent. This area would be under the control of the mine owner or a government agency to prevent excessive exposure to individuals.

Option 2: Work Practice Standard. This standard would include requirements for use of one or more of the following techniques to reduce radon emissions: bulkheading worked-out stopes (including the use of charcoal absorbers on bleeder pipes), backfilling worked-out stopes, and using sealants on mine walls.

Option 3: Emission Standard. This type of standard would establish an emission limit in curies per year of radon-222 from a mine vent as a function of the distance from the vent to the nearest unrestricted area. The emission limit would be set at a value that would keep the radon-222 concentration in ambient air in unrestricted areas below some predetermined value above background.

V. Elemental Phosphorus Plants

A. General Description

About 10 percent of the phosphate rock mined in the United States is used to produce elemental phosphorus. Elemental phosphorus is used primarily for the production of high-grade phosphoric acid, phosphate based detergents, and organic chemicals. In 1977, approximately 285,000 metric tons of elemental phosphorus were produced from 4 million metric tons of phosphate rock.

Phosphate rock contains appreciable quantities of uranium and its decay products. The uranium concentration of phosphate rock ranges from about 20 to 200 parts per million (ppm), which is 10 to 100 times higher than the uranium concentration in most natural rocks and soil (2 ppm). The significant radionuclides present in phosphate rock are uranium-238, uranium-34, thorium-230, radium-226, radon-222, lead-210, and polonium-210. Because phosphate rock contains elevated concentrations of these radionuclides, handling and processing this material can, via dust particles, release radionuclides into the air. More importantly for elemental phosphorus plants, heating the phosphate rock to high temperatures in calciners and electric furnaces can volatilize lead-210 and polonium-210, resulting in the release of large quantities of these radionuclides in to the air.

There are eight elemental phosphorus plants in the United States; these plants are located in Florida, Idaho, Montana, and Tennessee. EPA measurements at three of these plants show that polonium-210 and lead-210 are the radionuclides released from these plants in largest quantities. Most of these emissions occur in calciner stack exhausts. Based on these measurements, it is estimated that a large plant processing phosphate rock containing 25 picocuries per gram of uranium-238 and its decay products and using low energy scrubbers on its calciner exhausts would release about 4 curies of polonium-210 and 2 curies of lead-210 per year into the air. Several of the presently operating elemental phosphorus plants may be releasing comparable quantities of polonium-210 and lead-210, and these emissions would represent the largest quantity of alpha-emitting radionuclides released as particulates into the air by any type of facility in the United States.

B. Estimates of Dose and Risk

The most significant hazard associated with radionuclide emissions to air from elemental phosphorus plants is the radiation dose received by individuals living near those plants. EPA estimates that the radionuclide emssions, primarily polonium-210 and lead-210, from a large elemental phosphorus plant will cause radiation doses of 45 mrem/y to the kidney and 36 mrem/y to the lung of the most exposed individual living near the plant. The lifetime risk to the maximally exposed individual associated with these doses is estimated to be about 1 in 10,000.

The risks to the populations living near elemental phosphorus plants are relatively low. EPA estimates that the potential health risk to the population living around a large plant is about 1 health effect per 100 years of plant operation and that the total risk from radionuclide emissions from all elemental phosphorus plants is about 1 health effect per 20 years of operation.

These estimates were developed using methods and assumptions discussed in Unit I.C. of this notice. It is important to recognize that the acutal risk to specific individuals may differ greatly from these estimates because the circumstances involving the exposure may differ significantly from the assumptions used to make the estimates.

C. Control Technology

Particulate emissions from calciner exhausts at elemental phosphorus plants are controlled through the use of wet scrubbers. Most plants use either spray towers or low-energy venturi scrubbers. Such systems are estimated to control particulate emissions to about 0.5 to 1.0 pound per ton of rock processed and are about 80 to 90 percent efficient for removal of polonium-210. One plant operates with two venturi-like scrubbers in series. Such a system should control particulate emissions to about 0.1 pound per ton of rock processed and is about 98 percent efficient for removal of polonium-210.

EPA has estimated the cost of installing high-energy venturi scrubbers on calciner stacks at large elemental phosphorus plants now operating with spray towers or low-energy scrubbers. The capital cost per plant for installing these scrubbers is about $3 million, and the annual operating cost is $1.5 million. A high-energy venturi scrubber is expected to be at least 98 percent efficient for polonium-210 removal and to reduce the emissions of this radionuclide for a large plant to less than 1 Ci/y. Lead-210 will be controlled at least as well because the scrubbers will remove lead with at least equal efficiency.

D. The Proposed Standard

EPA is proposing that the emissions of polonium-210 in the calciner off-gases at elemental phosphorus plants be limited to 1 Ci/y. EPA believes the use of best available technology at these facilities can achieve this standard. Limiting the polonium-210 emissions also effectively limits the lead-210 and other radionuclide emissions in the calciner off-gases. this standard will keep the radiation doses to individuals living near these plants to less than 10 mrem/y to the lung and to less than 15 mrem/y to the kidney. The lifetime risk associated with these doses is less than 3 in 100,000. EPA believes this will protect the individuals living nearby with an ample margin of safety. The assumptions and uncertainties associated with estimates of risk are discussed in Units I.C. and V.B. of this notice.

Complete information is not available on the polonium-210 emissions from all elemental phosphorous plants. Therefore, some uncertainty exists regarding the number of plants that would need to retrofit emission control systems. However, based on presently available information, EPA estimates that no more than two plants would need to install additional control systems to meet the proposed standard. These would be the large-capacity plants processing high-radionuclide-content phosphate rock. Installation of high-energy venturi scrubbers on the calciner exhausts of two plants would result in a capital expenditure of about $6 million and annual operating costs of $3 million per year.

Under the proposed standard, owners or operators of elemental phosphorus plants will be required to (a) measure the polonium-210 emissions from their calciner stacks and to report the results of these tests to EPA and (b) continuously monitor the pressure drop across their calciner scrubbers and to maintain records of these measurements for a minimum of two years.

EPA requests comments on the proposed values and the methodology used in arriving at them.

E. Alternatives to the Proposed Standard

The Agency considered proposing higher or lower values then 1 Ci/y. Higher values did not seem justified because they would either not significantly reduce the radiation doses to individuals living near these plants or would cost just as much to implement as the proposed standard. Lower values were also considered, but available information indicates that additional control technology is not feasible to meet lower levels.

The Agency also considered a standard expressed as curies/metric ton of phosphate rock processed. However, this type of standard may require emmission control retrofit by one or more additional plants even though their emissions of polonium-210 would be significantly less than 1 Ci/y. Since the primary purpose of the standard is to limit the annual radiation doses to the most exposed individual living near these plants, the Agency concluded that an annual emission limit, rather than an emission limit per unit of rack processed, is the more appropriate form of the standard.

VI. Sources for Which Standards Are Not Proposed

EPA has identified several source categories that emit radionuclides to air for which standards are not being proposed. These emissions comprise radionuclides that occur naturally in the environment but are released to air due to industrial processes. In addition to these sources, EPA is not proposing emission standards for uranium fuel cycle facilities, uranium mill tailings, management of high level radioactive wastes, and low energy accelerators. The reasons for these decisions are discussed in the following paragraphs. Additional supporting information may be found in the Docket and in the Background Information Document.

Estimates of risk used in this analysis were developed using methods and assumptions discussed in Unit I.C. of this notice. It is important to recognize that the actual risk to specific individuals may differ greatly from the estimates because the circumstances involving the actual exposure may differ greatly from the assumptions used to make the estimates.

A. Coal-Fired Boilers

Large, coal-fired boilers are used by utilities and industry to generate electricity and by industry to make process steam and to heat water for space heaters and industrial processes. When these boilers are operating, trace amounts of uranium, radium, thorium, and decay products of these radionuclides that are present in coal become incorporated into the fly ash and are emitted along with the particulates into the air. Technology that removes particulates will, therefore, also limit radionuclide emissions.

Particulate emissions from new utility boilers are controlled under Section III of the Act (43 FR 42154, September 19, 1978, revised by 44 FR 33613, June 11, 1979). These New Source Performance Standards (NSPS) require utility boilers constructed after September 19, 1978, to have best available technology that limits particulate emissions to 13 nanograms per Joule (ng/J) (0.03 pound/million Btu). To meet this emission standard, electrostatic precipitators (ESPs) or fabric filter systems are usually installed. Doses from utility boiler radionuclide emissions under NSPS are low, less than 1 mrem/y to any organ, and there is no practical way to reduce them further since best available technology is already being used. Further reduction in emissions would require a second fabric filter or ESP in series with the first; this would be unreasonably expensive for the emission reduction achieved. Thus, radionuclide emission standards for new utility boilers would be either redundant or, if more restrictive, prohibitively expensive.

Particulate emissions from new large industrial boilers are controlled by NSPS that limit particulate matter to 43 ng/J (0.1 pound/million Btu). EPA plans to propose NSPS for smaller industrial boilers also; draft proposed limits have been circulated for comment. These standards should reduce particulate emissions to low levels and should correspondingly reduce doses to nearby individuals from radionuclide emissions to less than 1 mrem/y to any organ. With NSPS in place, radionuclide standards for industrial boilers would be redundant.

Existing utility and industrial boilers are regulated for particulate emissions by State Implementation Plans (SIPs) required by the Act. Limits vary for specific plants, but, in general, SIPs require large boilers located in populated areas to be well controlled with ESPs. Preliminary information indicates that retrofitting existing utility boilers to further reduce radionuclide emissions would cost approximately $15 billion for capital improvements and $3 billion a year to operate them. Total retrofitting of the industry with best available technology would reduce the estimated potential health effects by about 1 to 2 per year. For industrial boilers, the costs are about $3 billion for capital improvements and $0.7 billion to operate them. Total retrofitting of the industry with best available technology would reduce the estimated potential health effects by about 1 every three years. For both utility and industrial boilers, the costs are judged to be unreasonable in comparison to the reduction in dose and risk that would result.

The amount of radionuclides that could potentially be emitted by coal-fired boilers is strictly limited by the amount of uranium and thorium in the incoming coal. EPA has no reasons, therefore, to expect that massive releases of radionuclides will occur or that current emission rates will increase significantly. Under the current Federal and State regulatory programs, emissions should slowly decrease as old boilers are replaced.

In summary, EPA is not proposing standards for coal-fired boilers because existing emission controls that limit particulate releases also limit radionuclide releases. The risks to nearby individuals and the total risks to populations after application of controls already required are not large when compared to the cost of additional control technology. There is no potential for emissions to increase due to the limited amounts or radionuclides within the coal; rather, overall emissions will decrease with time as old plants are replaced with new ones with improved emission controls as required by the NSPS for particulate emissions.

EPA did consider the possibility that boilers may be using coal with radionuclide content that is significantly above average or that existing boilers may be operating in a manner that causes elevated emissions of radionuclides. If this is the case, there could be a subcategory of coal-fired boilers for which it would be appropriate to issue an emission standard. EPA requests comments and information on whether these situations do exist, their causes, their significance to public health, whether emission standards are needed, and what emission levels would be appropriate.

B. Phosphate Industry

The phosphate industry processes phosphate rock to produce fertilizers, detergents, animal feeds and other products. The production of fertilizer uses approximately 80 percent of the phosphate rock mined in the United States. Diammonium phosphate and triple superphosphate are the phosphate fertilizers produced in the largest quantities. Phosphate deposits contain large quantities of natural radioactivity, principally uranium-238 and members of its decay series. Uranium concentrations in phosphate deposits range from 10 to 100 times the concentration of uranium in other natural rocks and soils.

The processing of phosphate rock in dryers, grinders, and fertilizer plants results in the release of radionuclides into the air. As with coal-fired boilers, control techniques that remove particulates will also control radionuclide emissions and risks. Particulate emissions from the process exhausts of these plants are already well controlled, and the doses to individuals and populations from the radionuclides contained in the particulates are less than 15 mrem/y to any organ.

Particulate emissions from new or modified phosphate rock dryer and grinder facilities are already regulated by NSPS under Section 111 of the Act (47 FR 16582, April 16, 1982). To meet these standards, high-energy scrubbers of high-energy ESPs are usually installed on dryers, and fabric filters are installed on grinders. Particulate emissions from existing dryers and grinders are regulated under SIPs. About 20 percent ot the existing dryers already have controls equivalent to NSPS; the remaining dryers either employ low-energy or medium-energy scrubbers. About 75 percent of the existing grinders already have controls equivalent to NSPS; the remaining grinders use the equivalent of medium-energy scrubbers.

To retrofit all existing phosphate rock dryers with best available technology would require a capital expenditure of $44 million and an increase of $3 million in annual operating costs. This would reduce the maximum individual bone dose from 15 mrem/y to 3 mrem/y and avoid 1 health effect in 50 years of operations. To retrofit all existing phosphate grinders with best available technology would require a capital expenditure of $4 million but would not increase the annual operating cost. This would reduce the maximum individual bone dose from 1 mrem/y to 0.2 mrem/y and avoid 1 health effect in 500 years of operations.

Phosphate fertilizer plants use wet-scrubber systems on their process exhausts. These controls are needed to comply with NSPS (40 CFR Part 60, Subparts T through X) or SIPs for fluoride emissions. About 75 percent of the existing industry production capacity is controlled by both primary and secondary scrubbers. Scrubbers used to control fluoride emissions are also effective controls for particulate emissions.

To retrofit all existing fertilizer plants with secondary scrubbers on their diammonium phosphate and triple superphosphate process stacks would require capital costs of $14 million and would result in an increase of $1.5 million in annual operating costs. This would reduce the maximum individual bone dose from 2 mrem/y to 1 mrem/y and would avoid 1 health effect in 500 years of operations.

In summary, EPA is not proposing standards for phosphate rock dryers and grinders or phosphate fertilizer plants, because (1) the bone dose to individuals represent a small hazard to health compared to a similar dose to most other organs, (2) the potential for increased emissions is not present due to the limited amount of radionuclides in the phosphate rock, (3) other Clean Air Act standards require controls that also reduce radionuclide emissions, and (4) the cost to further reduce radionuclide emissions is unreasonably large compared to the additional protection achieved.

About 25 percent of the phosphate rock used for fertilizer production is treated in calciners rather than dryers to remove organic matter prior to processing. Since calciners operate at significantly higher temperatures than dryers, this may result in the volatilization and release to air of significant quantities of polonium-210, similar to the emissions from elemental phosphorus plants. Radionuclide emission studies are being planned for phosphate rock calciner plants. However, no radionuclide emission data are available for calciners, and, therefore, EPA is unable to determine at this time that standards are needed for these facilities. EPA requests comments and information on these emissions, their significance to public health, whether emission standards are needed, and what limits would be appropriate.

C. Other Extraction Industries

Almost all industrial operations involving removal and processing of soils and rocks to recover valuable commodities release some radionuclides into the air. EPA has carried out studies of airborne radioactive emissions from such mining, milling, and smelting operations.

The industries studied include iron, copper, zinc, clay, limestone, fluorspar, and bauxite. These are relatively large industries and are, therefore, considered to have the greatest potential for emitting radioactive materials into the air.

Although the analysis of data from these stidies is not complete, the information available to the Agency at the present time shows that the radiation doses to individuals and populations from radionuclide emissions from these types of facilities are small and would not be reduced at reasonable cost. Therefore, EPA is not proposing standards for these parts of the extraction industry.

D. Uranium Fuel Cycle Facilities, Uranium Mill Tailings, and Management of High Level Waste

The Uranium Fuel Cycle (UFC) consists of operations associatd with production of electric power for public use by light-water-cooled reactors using uranium fuel. It includes light-water-cooled nuclear power plants and facilities that mill the uranium ore, enrich uranium, and fabricate and reprocess uranium fuel. EPA has promulgated emission standards for normal operations of the UFC under the Atomic Energy Act (40 CFR Part 190). These standards limit the annual dose equivalent to body organs of nearby individuals to 25 mrem/y (75 mrem/y for the thyroid) and limit the emissions of krypton-85, iodine-129, and other long-half-life, alpha-emitting, transuranium radionuclides. As a practical matter, the EPA standards and their implementation by the NRC require the use of best available technology, which keeps doses to individuals and populations to low levels. The estimated individual risk associated with 25 mrem/y to all organs for a lifetime is about 1 in 2000.

Uranium mill tailings remain after uranium ore is processed to remove the uranium. Altogether, there are many thousands of acres of these tailings at both inactive and active uranium mill sites, mosely in the Southwest. Large amounts of radon-222 are emitted to air from the piles due to the radium-226 remaining in the tailings after the uranium is removed. Congress addressed this problem through the Uranium Mill Tailings Radiation Control Act of 1978 (Pub. L. 95-604). Under this authority, EPA has active programs to promulgate standards requiring remedial actions that will, among other objectives, prevent these tailings from being moved and prevent radon from escaping after the piles become inactive. Standards have been promulgated for inactive mill sites and will soon be proposed for active mill sites.

The highly radioactive liquid or solid wastes from reprocessing spent nuclear fuel, or the spent fuel elements themselves if they are disposed of without reprocessing, are called "high level wastes". Over the last several years, the Federal government has intensified its program to develop and demonstrate a permanent disposal method for high level waste. As part of this effort, EPA has proposed standards to limit radiation exposure of members of the public from management of this waste prior to disposal (47 FR 58196, December 29, 1982). These proposed standards would limit the annual dose equivalent to any member of the public to 25 mrem/y to the whole body, 75 mrem/y to the thyroid, or 25 mrem/y to any other organ. Waste managment operations are also to be conducted so as to reduce exposures below these levels to the extent that this is reasonably achievable.

EPA is not proposing additional radionuclide standards for UFC facilities, uranium mill tailings, and high level wastes because the Agency believes that EPA standards established (or to be established) under other applicable authorities will protect public health with an ample margin of safety in the same way as an emission standard established under Section 112 of the Act.

E. Low Energy Accelerators

Accelerators, which impart energy to charged particles such as electrons, alpha particles, and protons, are used for a wide variety of applications, including radiography, activation analysis, food sterilization and preservation, radiation therapy, and research. There are over 1,200 accelerators in use in the United States, not including accelerators owned by DOE. This number has been growing at a rate of approximately 65 machines per year.

Accelerators other than those owned by the DOE operate at low energy levels (i.e., less energy is imparted to the particles). These machines emit very small quantities of radionuclides (specifically, carbon-11, carbon-14, nitrogen-13, oxygen-15, and argon-41) because they operate at relatively low energies. In addition, those accelerators using tritium targets may emit a small quantity of tritium, typically less than 1 Ci/y. The quantity of radionuclides produced is so small that the doses and health risks associated with those emissions are extremely low, generally several orders of magnitude less than other sources discussed in the proposed rule. Further, there is no practical way to reduce them. EPA is not proposing standards for accelerators because of the low doses, less than 1 microrem/y to nearby individuals, and because there is no potential for the doses from existing or new facilities to exceed this level significantly.

F. Request for Comments

EPA requests comments on its proposed decisions not to issue standards for radionuclide emissions from the categories of sources just described. These decisions will be reconsidered if additional information becomes available indicating that doses and risks are significantly greater, costs are significantly lower, or controls are more available than those on which EPA based its decisions.

If the Administrator decides not to issue standards for particular source categories, such decisions are likely to be accompanied by determinations that these decisions are of nationwide scope and effect under the terms of section 307(b) of the Act.

VIII. Miscellaneous

A. Docket

The Docket is an organized and complete file of all information considered by EPA in the development of these proposed standards. The Docket allows interested persons to identify and locate documents so that they can effectively participate in the rulemaking process. It also serves as the record for judicial review.

A transcript of the hearing and all written statements will be placed in the Docket and will be available for inspection and copying during normal working hours.

B. Executive Order 12291

Under Executive Order 12291, issued February 17, 1981, EPA must judge whether a rule is a "major rule" and, therefore, subject to the requirement that a Regulatory Impact Analysis be prepared. EPA has detemined that this rule is not a major rule as that term is defined in Section 1(b) of the Executive Order.

EPA concluded that the rule is not major under the criteria of section 1(b) because the annual effect of the rule on the economy will be less than $100 million. It will not cause a major increase in costs or prices for any sector of the economy or for any geographic region. Also, it will not result in any significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States enterprises to compete with foreign enterprises in domestic or foreign markets.

This proposed rule was submitted to the Office of Management and Budget (OMB) prior to publication, as required by the Executive Order.

List of Subjects in 40 CFR Part 61

Air pollution control, Asbestos, Beryllium, Hazardous materials, Mercury, Vinyl chloride, Radionuclides.

C. Paperwork Reduction Act

The Paperwork Reduction Act of 1980 (Pub. L. 96–511) (PRA) requires that the Office of Management and Budget review reporting and recordkeeping requirements that constitute "information collection" as defined. Assuming, without deciding, that some or all of the proposed reporting and recordkeeping requirements constitute information collection within the meaning of the PRA, the PRA requires the Office of Management and Budget to review information collection activities to determine whether they are "necessary for the proper performance of the functions of the Agency" (section 3508).

This proposal, if promulgated, would impose reporting and recordkeeping requirements for one Federal agency and on owners and operators of elemental phosphorus plants and underground uranium mines.

EPA requests comments on the reasonableness of the information collection requirements and on the costs involved as compared to other means of compliance determinations.

D. Regulatory Flexibility Analysis

Section 603 of the Regulatory Flexibility Act, 5 U.S.C. 603, requires EPA to prepare and make available for comment an "initial regulatory flexibility analysis" in connection with any rulemaking for which there is a statutory requirement that a general notice of proposed rulemaking be published. The "initial regulatory analysis" describes the effect of the proposed rule on small business entities.

However, Section 604(b) of the Regulatory Flexibility Act provides that Section 603 "shall not apply to any proposed * * * rule if the head of the Agency certifies that the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities."

EPA believes that virtually all small businesses covered by this proposed rule are already meeting the proposed standards. Therefore, this rule will have little or no impact on small businesses.

For the preceding reasons, I certify that this rule, if promulgated, will not have significant economic impact on a substantial number of small entities.

Dated: March 29, 1983.

Lee Thomas,

Acting Administrator.

It is proposed to amend Part 61 of chapter I of title 40 of the Code of Federal Regulations as follows:

1. By adding to the table of sections the following items:

Subpart K—National Emission Standards for Radionuclide Emissions from Department of Energy Facilities

Sec.
61.120 Designation of facilities.
61.121 Definitions.
61.122 Standard.
61.123 Emission monitoring and test procedures.
61.124 Compliance and reporting.

Subpart L—National Emission Standard for Radionuclide Emissions From Facilities Licensed by the Nuclear Regulatory Commission and Federal Facilities Not Covered by Subpart K

61.130 Applicability.
61.131 Definitions.
61.132 Standard.

Subpart M—National Emission Standard for Radionuclide Emissions From Underground Uranium Mines

61.140 Applicability.
61.141 Definitions.
Sec.
61.142 Standard.
61.143 Emission tests.
61.144 Reporting.

Subpart N—National Emission Standard for Radionuclide Emissions From Elemental Phosphorous Plants

61.150 Applicability.
61.151 Definitions.
61.152 Standard.
61.153 Emission tests.
61.154 Test methods and procedures.
61.155 Monitoring of Operations.

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Appendix B—Test Methods

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Method 111—Determination of polonium-210 emissions from stationary sources.

Authority: Sec. 112 and 301(a), Clean Air Act, as amended [42 U.S.C. 7412, 7601(a)].

2. By adding the following Subpart K:

Subpart K—National Emission Standards for Radionuclide Emissions From Department of Energy Facilities

§ 61.120 Designation of facilities.

The provisions of this subpart apply to radiation dose equivalent values received by members of the public as the result of operations at facilities that are owned or operated by the Department of Energy and that emit radionuclides to air.

§ 61.121 Definitions.

(a) "Whole body" means all human organs, organ systems, and tissues exclusive of the integumentary system (skin) and cornea.

(b) "Organ" means any human organ or tissue exclusive of the integumentary system (skin) and the cornea.

(c) "Radionuclide" means any nuclide that emits radiation.

(d) "Dose equivalent" means the product of absorbed dose and appropriate factors to account for differences in biological effectiveness due to the quality of radiation and its distribution in the body. The unit of the dose equivalant is the rem.

§ 61.122 Standard.

Emissions of radionuclides to air from operations of Department of Energy facilities shall not exceed those amounts that cause a dose equivalent rate of 10 mrem/y to whole body or 30 mrem/y to any organ of any member of the public.

§ 61.123 Emission monitoring and test procedures.

To determine compliance with the standard, radionuclide emissions shall be determined and dose equivalent values to members of the public calculated using EPA approved sampling procedures, codes AIRDOSE-EPA and RADRISK, or other procedures which EPA has determined to be suitable.

§ 61.124 Compliance and reporting.

DOE shall submit to EPA an annual report which includes the results of monitoring emissions from points subject to this standard and dose calculations for each site. The report shall also describe the DOE program for maintaining airborne radionuclide releases as low as practicable below the standard, including a discussion of current controls, new control equipment installed during the year, and a discussion of new controls that are under consideration.

3. By adding the following Subpart L:

Subpart L—National Emission Standards for Radionuclide Emissions From facilities Licensed by the Nuclear Regulatory Commission and Federal Facilities Not Covered by Subpart K

§ 61.130 Applicability.

The provisions of this subpart apply to NRC-licensed facilities and to facilities owned or operated by any Federal agency other than the Department of Energy, except that this subpart does not apply to facilities regulated under 40 CFR Part 190 or to any accelerator.

§ 61.131 Definitions.

(a) "Agreement State" means and State with which the Atomic Energy Commission or the Nuclear Regulatory Commission has entered into an effective agreement under subsectin 274(b) of the Atomic Energy Act of 1954, as amended.

(b) "Dose equivalent" means the product of absorbed dose and appropriate factors to account for differences in biological effectiveness due to the quality of radiation and its distribution in the body. The unit of the dose equivalent is the rem.

(c) "NRC/licensed facility" means any facility licensed by the Nuclear Regulatory Commission or any Agreement State to receive title to, receive, possess, use, transfer, or deliver any source, by-product, or special nuclear material.

(d) "Organ" means any human organ or tissue exclusive of the integumentary system (skin) and the cornea.

(e) "Radionuclide" means any nuclide that emits radiation.

§ 61.132 Standard.

(a) Emissions of radionuclides to air from facilities subject to this subpart shall not exceed those amounts that cause a dose equivalent rate of 10 mrem/y to any organ of any member of the public.

(b) This standard shall be implemented using pathway and dose equivalent calcuations based on EPA's codes AIRDOSE-EPA and RADRISK or modeling techniques which, in EPA's judgment, are as suitable for particular applications as the EPA codes.

4. By adding the following Subpart M:

Subpart M—National Emission Standard for Radionuclide Emission From Underground Uranium Mines

§ 61.140 Applicability.

The provisions of this subpart are applicable to owners or operators of underground uranium mines.

§ 61.141 Definitions.

(a) "Unrestricted area," as used in this subpart, means an area not under the control of the mine owner or operator or a governmental agency for the purpose of restricting the use or establishment of structures for residential purposes.

(b) "Mine vent" means a shaft extending from the working areas of an underground uranium mine to the earth's surface for the purpose of discharging ventilation air from the mine to the earth's atmosphere.

(c) "Curie" is a unit of radioactivity equal to 37 billion nuclear transformations (decays) per second.

§ 61.142 Standard.

The radon-222 emissions to air from the mine vents of an underground uranium mine shall not result in an increase in the annual average randon-222 concentration in air in an unrestricted area in excess of 0.2 pCi/1.

§ 61.143 Emission tests.

(a) Unless a waiver of emission testing is obtained under 61.13, each mine owner or operator subject to 61.142 shall measure the radon-222 emissions from each of his mine vents:

(1) Within 90 days of the effective date of this rule, and annually thereafter, in the case of an existing source or a new source which has an initial startup date preceding the effective date of this rule; or

(2) Within 90 days of startup, and annually thereafter, in the case of a new source that did not have an initial startup date proceding the effective date.

(b) The Administrator shall be notified at least 30 days prior to an emission test so that EPA may, at its option, observe the test.

(c) Each emission test shall consist of three runs. The tests shall be conducted during normal operating and ventilation conditions. The average of all three runs shall apply in computing the emission rate.

(d) For use in calculating radon-222 concentrations in unrestricted areas under § 61.144, the annual emissions from each mine vent shall be determined by multiplying the radon-222 concentration measured in the air emitted from the mine vent by the total volume of air discharged through the vent over a one year period based on continuous operation of the ventilation system.

(e) Records of emission test results and other data needed to determine total emissions shall be retained at the source and made available for inspection by the Administrator for a minmium of 2 years.

§ 61.144 Reporting.

(a) Each owner or operator of a source subject to the requirements of § 61.142 shall calculate the average annual radon-222 concentration in air at the nearest unrestricted area to each of the mine vents from his mine using the following equation:

$$C_j=0.1\sum_i Q_i\,(X_{ij})^{-1.72}$$

Where

C_j= radon-222 concentration in picocuries per liter (pCi/1) at location j due to all vents from the mine.
Q_i= radon emission rate in kilocuries per year from vent i.
X_{ij}= distance in kilometers from mine vent i to location j.

(b) Rather than use the method prescribed in paragraph (a), an owner or operator of a mine may, subject to the approval of the Administrator, use dispersion factors based on site specific meteorology.

(c) The calculations performed under paragraph (a) or (b) shall be reported to the Administrator within 30 days of completion of the emission tests required under § 61.143.

5. By adding the following Subpart N:

Subpart N—National Emission Standard for Radionuclide Emission From Elemental Phosphorus Plants

§ 61.150 Applicability.

The provisions of this subpart are applicable to owners and operators of nodulizing kilns and electric furnaces at elemental phosphorus plants.

§ 61.151 Definitions.

(a) "Elemental phosphorus plant" means any facility that processes phosphate rock to produce elemental phosphorus using pyrometallurgical techniques.

(b) "Nodulizing kiln" means a unit in which phosphate rock is heated to convert it to a nodular form.

(c) "Electric furnace" means a unit in which the phosphate rock is heated with silica and coke to reduce the phosphate to elemental phosphorus.

(d) "Curie" is a unit of radioactivity equal to 37 billion nuclear transformations (decays) per second.

§ 61.152 Standard.

Emissions of polonium-210 to air from sources subject to this subpart shall not exceed 1 curie in a calendar year.

§ 51.153 Emission tests.

(a) Unless a waiver of emission testing is obtained under § 61.13, each owner or operator required to comply with § 61.152 shall test emissions from his source within the following time limits:

(1) Within 90 days of the effective date of this rule in the case of an existing source or a new source that has an initial startup date preceding the effective date of this rule; or

(2) Within 90 days of startup in the case of a new source that did not have an initial startup date preceding the effective date of this rule.

(b) The Administrator shall be notified at least 30 days prior to an emission test so that EPA may, at its option, observe the test.

(c) Each emission test shall consist of three runs. The phosphate rock processing rate during each test shall be recorded. The averge of all three runs shall apply in computing the emission rate. For determining compliance with the emission standard of § 61.152, the annual polonium-210 emissions shall be determined by multiplying the polonium-210 emission rate in curies per metric ton of phosphate rock processed by the annual phosphate rock processing rate in metric tons. In determining the annual phosphate rock processing rate, the values used for operating hours and operating capacity shall be values that will maximize the expected production rate. If the owner or operator of a source subject to this subpart changes his operation in a way that could change his emissions of polonium-210, he may determine his compliance with the requirements of this subpart on the basis of calculations using data from previous emission tests.

(d) All samples shall be analyzed, and polonium-210 emissions shall be determined within 30 days after the source test. All determinations shall be reported to the Administrator by a registered letter dispatched before the close of the next business day following such determination.

(e) Records of emission test results and other data needed to determine total emissions shall be retained at the source and made available for inspection by the Administrator for a minimum of 2 years.

§ 61.154 Test methods and procedures.

(a) Each owner or operator of a source required to test emissions under § 61.153, unless an eqivalent or alternate method has been approved by the Administrator, shall use the following test methods:

1. Test Method 1 of Appendix A to Part 60 shall be used to determine sample and velocity traverses;
2. Test Method 2 of Appendix A to Part 60 shall be used to determine velocity and volumetric flow rate;
3. Test Method 5 of Appendix A to Part 60 shall be used to collect particulate matter containing the polonium-210;
4. Test Method 111 of Appendix B to this part shall be used to determine the polonium-210 emissions.

§ 61.155 Monitoring of operations.

(a) The owner or operator of any source subject to this subpart using a wet scrubbing emission control device shall install, calibrate, maintain, and operate a monitoring device for the continuous measurement of the pressure loss of the gas stream through the scrubber. The monitoring device must be certified by the manufacturer to be accurate within ± 250 pascals (± 1 inch of water). Records of these measurements shall be maintained at the source and made available for inspection by the Administrator for a minimum of two years.

(b) For the purpose of conducting an emission test under § 61.153, the owner or operator of any source subject to the provisions of this subpart shall install, calibrate, maintain, and operate a device for measuring the phosphate rock feed to any affected nodulizing kiln. The measuring device used must be accurate to within ± 5 percent of the mass rate over its operating range.

Appendix B—[Amended]

6. By adding the following test method of Appendix B:

Method 111—Determination of Polonium-210 Emissions From Stationary Sources

Performance of this method should not be attempted by persons unfamiliar with the use of equipment for measuring radioactive disintegration rates.

1.0 Applicability and Principle

1.1 *Applicability.* This method is applicable to the determination of polonium-210 emissions in particulate samples collected in stack gases.

1.2 *Principle.* A particulate sample is collected from stack gases as described in Method 5 of Appendix A to 40 CFR Part 60. The polonium-210 in the sample is put in solution, deposited on a metal disc and the radioactive disintegration rate measured. Polonium in acid solution spontaneously deposits on surfaces of metals which are more electropositive than polonium. This principle is routinely used in the radiochemical analyses of polonium-210 (reference 1).

2.0 Apparatus

2.1 Alpha-counter photomultiplier tube, (5 cm), with associated electronics to record pulses.

2.2 Constant temperature bath at 85°C.

2.3 Polished nickel discs, 3.8 cm diameter, 0.6 mm thick.

2.4 Silver activated zinc sulfide screen.

2.5 Beakers, 400 ml, 150 ml.

2.6 Hot plate, electric.

2.7 Fume hood.

2.8 Teflon beakers, 150 ml.

Teflon is a registered trademark of DuPont Co.

3.0 Reagents

3.1 *Analysis.*

3.1.1 Ascorbic acid, reagent grade.

3.1.2 Distilled water.

3.1.3 Hydrochloric acid 12*M*, concentrated reagent grade.

3.1.4 Hydrofluoric acid 28*M*, reagent grade.

3.1.5 Nitric acid 16*M*, concentrated reagent grade.

3.1.6 Perchloric acid 12*M*, 72 percent reagent grade.

3.1.7 Sodium hydroxide 18*M*. Dissolve 720 g of sodium hydroxide pellets in distilled water and dilute to 1 liter.

3.1.8. Trichloroethylene.

3.2. *Standard solution.* Prepare calibrated solution of polonium-210 from supplier of this radionuclide. Known aliquots are to be used to establish efficiency of deposition.

4.0 Procedure

4.1 *Sample Preparation.*

4.1.1 Place filter collected by EPA Method 5 Part 60 in Teflon beaker, add 30 ml hydrofluoric acid and evaporate to dryness on hot plate in hood.

4.1.2 Repeat step 4.1.1 until glass fiber filter has been digested.

4.1.3 Add 100 ml 16*M* nitric acid to residue in Teflon beaker and evaporate to dryness. Do not overheat.

4.1.4 Add 50 ml 16*M* nitric acid to residue from step 4.1.3 and heat to 80°C.

4.1.5 Decant acid solution into glass beaker and add 10 ml 12*M* perchloric acid.

4.1.6 Heat acid mixture to perchloric acid fumes.

4.1.7 Adjust volume to 60 ml with distilled water and neutralize with 18*M* sodium hydroxide.

4.1.8 Dilute to 100 ml with distilled water and adjust solution to 0.5*M* in HCl by adding 4 ml 12*M* hydrochloric acid.

4.2 *Sample Analysis.* Analyze the solution for polonium-210 using any published method which involves the spontaneous electrodeposition of polonium-210, including the method described below:

4.2.1 Add 200 ml of ascorbic acid and heat solution to 85°C in constant temperature bath.

4.2.2 Melt a thin coating of polyethylene on the unpolished side of disc to prevent deposition. Adhesion of the polyethylene to the disc is enhanced by sanding the nickel surface with garnet paper.

4.2.3 Clean polished side with trichloroethylene, hydrochloric acid, and distilled water.

4.2.4 Suspended nickel disc in the solution using glass or plastic hook.

4.2.5 Maintain disc in solution for 3 hours while stirring the solution.

4.2.6 Remove nickel disc, rinse with distilled water and dry at room temperature.

4.3 Measurement of Polonium-210.

4.3.1 Position deposition side of nickel disc adjacent to zinc sulfide screen on photomultiplier tube and count pulses.

4.3.2 Establish background count rate by measuring counts over clean nickel discs.

4.3.3 Determine procedure efficiency by adding calibrated aliquots of polonium-210 to acid solution with clean filter and following procedure through radioassay step.

4.3.4 Determine counter efficiency by carefully evaporating known aliquots of polonium-210 on nickel disc and measuring count rate, comparing count rate to known disintegration rate as fraction.

5.0 Calculations

5.1 Calculate the curies of polonium-210 in the sample using the following equation:

$$A = \frac{C_T - C_B}{2.22 \times 10^{+12} (E_C)(E_P)(T)(D)}$$

A=Curies of polonium-210 in sample.
C_T=total sample counts for counting period.
C_B=background counts for counting period.
E_P=procedure efficiency.
E_C=counting efficiency.
T=counting time in minutes.
D=decay correction.

5.1.1 Decay Correction

$$\text{Decay correction } (D) = e - \frac{0.693(T)}{t_{1/2}}$$

T=time in days from midpoint of collection time to the counting time.
$t_{1/2}$=radiological half life of polonium-210, 138.4 days.

5.2 Procedure for Calculating Emissions.

Calculate the polonium-210 emission per metric ton of rock processed using the following equation:

$$E = \frac{AQ_S}{V_t M}$$

E=Curies of polonium-210 per metric ton of rock processed.
A=Curies of polonium-210 in sample from 5.1.
Q_S=Volumetric flow rate of effluent stream in m^3/h.
V_t=Total volume of air sampled in m^3.
M=Rock processing rate during sampling in metric tons/hr.

6.0 References

1. Blanchard, Richard L., Rapid Determination of Lead-210 and Polonium-210 in Environmental Samples by Deposition on Nickel, Anal. Chem., *38*, 189 (1966).

[FR Doc. 83-8726 Filed 4-5-83; 8:45 am]
BILLING CODE 6560-50-M

4

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 61

[AD-FRL-3072-7]

National Emission Standards for Hazardous Air Pollutants; Review and Revision of the Standards for Mercury

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final Rule; Review.

SUMMARY: Today's action promulgates revisions to the national emission standards for the hazardous air pollutant mercury [Chemical Abstract Service (CAS) Registry Number 7439-97-6]. Revisions were proposed in the **Federal Register** on December 26, 1984. These revisions add monitoring, reporting, and one-time emission testing requirements to the standards for mercury-cell chlor-alkali plants and allow an owner or operator the option of developing and submitting for approval a plant-specific monitoring plan. The revisions also allow the owner or operator of any facility affected by 40 CFR Part 61, Subpart E, up to 15 days to verify the validity of source test data prior to reporting the results to the Administrator.

EFFECTIVE DATE: March 19, 1987. These revisions become effective upon promulgation and apply to all new and existing affected facilities.

Under section 307(b)(1) of the Clean Air Act, judicial review of the actions taken by this notice is available *only* by the filing of a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit within 60 days of today's publication. Under section 307(b)(2) of the Clean Air Act, the requirements that are the subject of today's notice may not be challenged later in civil or criminal proceedings brought by EPA to enforce these requirements.

ADDRESSES: *Review Documents.* The document summarizing emissions information gathered during the review of the standards may be obtained from the EPA Library (MD-35), Research Triangle Park, North Carolina 27711, telephone number (919) 541-2777. Please refer to "Review of National Emission Standards for Mercury," EPA-450/3-84-014b.

The document summarizing current information on the potential health effects associated with mercury exposures may be obtained from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161, telephone number (703) 487-4650 (NTIS stock number PB-85-123925). Refer to "Mercury Health Effects Update," EPA-600/8-84-019F, August 1984. The price of the document, including shipping, is $19.95.

Docket. Docket No. A-82-41, containing information considered by EPA in developing the revisions, is available for public inspection and copying between 8:00 a.m. and 4:00 p.m., Monday through Friday, at EPA's Central Docket Section, West Tower Lobby, Gallery 1, Waterside Mall, 401 M Street, SW., Washington, DC 20460. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: *Policy issues:* Ms. Dianne Byrne or Mr. Gil Wood, Standards Development Branch, Emission Standards and Engineering Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541-5578 *Technical issues:* Mr. John Copeland or Dr. James Crowder, Industrial Studies Branch, Emission Standards and Engineering Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541-5601.

SUPPLEMENTARY INFORMATION:

I. Summary of Review and Revisions

The national emission standards for mercury limit emissions from mercury ore processing facilities, sludge incineration and drying plants, and mercury-cell chlor-alkali plants. During its review of the standards, the EPA identified two areas in which revisions were warranted. The first area pertains to the appropriate amount of time, following completion of performance tests, that should be provided for reporting the results of those tests to the Administrator. The standards allowed 30 days following completion of the performance tests for the samples to be analyzed and emissions to be determined and required that the results be reported on the day after the determination was made. These revisions change that requirement. An owner or operator is now allowed 15 days after the determination of emissions to notify the Administrator of the test results. The additional 2 weeks are to provide time for the results to be reviewed and verified at the source before they are sent to the Administrator.

The second area in which revisions to the standards were warranted pertains to the monitoring and recordkeeping requirements for chlor-alkali plants. Compliance data for the hydrogen and end box ventilation streams at mercury-cell chlor-alkali plants indicated that, while many plants emit at levels just below the standard during normal operations, excess emissions have occurred during periods of control systems failures. To ensure that control systems are properly operated and maintained on a continuous basis, specific monitoring, recordkeeping, and reporting requirements have been added to the standards as well as a requirement for a one-time performance test. These requirements were fully described in the preamble to the proposed revisions (49 FR 50146, December 26, 1984).

In response to comments received on the proposed requirements, an alternative monitoring/recordkeeping/reporting provision has been added to the standards. This alternative allows each owner or operator of a mercury-cell chlor-alkali plant the option of developing and submitting for approval a plant-specific monitoring plan. To be approved, an alternative monitoring plan must adhere to the guidelines that are provided in the regulation.

The proposed standards required each owner or operator of a mercury-cell chlor-alkali plant that uses housekeeping practices to comply with the standard for cell room ventilation systems to maintain daily records of all leaks or spills of mercury in the cell room. These requirements have not changed.

As explained in the preamble to the proposed revisions and in the background document for the promulgated standards, the review of the standards did not indicate a need to revise the emission limits for the three source categories that are covered by the standards or to regulate additional sources of mercury emissions under these standards at this time.

II. Summary of Impacts of the Revisions

Extending the time limit for the submission of test data is intended to improve the quality of test results that are submitted and should have no environmental, economic, cost or energy impacts.

The addition of monitoring, recordkeeping, and reporting requirements for mercury-cell chlor-alkali plants will benefit the environment by encouraging plant operators to adopt the best practices for operating and maintaining process equipment and control devices. The additional reduction in mercury emissions has not been quantified. The average yearly cost to each plant during the first 3 years that the revisions are in effect would be approximately $9,000. Most of this cost is attributable to the one-time performance test.

III. Public Participation

Prior to proposal of the revisions, interested parties were advised by public notice in the Federal Register (48 FR 50606, November 2, 1983) of a meeting of the National Air Pollution Control Techniques Advisory Committee to discuss recommended revisions to the mercury standard. This meeting was held on November 29, 1983. The meeting was open to the public, and each attendee was given an opportunity to comment on the standards recommended for proposal.

The proposed revisions were published in the Federal Register on December 26, 1984 (49 FR 50146). The preamble to the proposed revisions discussed the availability of the review document, which summarized the emissions information gathered during the review, and of the health effects document, which summarized current information on potential health effects associated with mercury exposures. Public comments were solicited at the time of proposal, and copies of the documents were distributed to interested parties.

To provide interested persons the opportunity for oral presentation of data, views, or arguments concerning the proposed standards, the opportunity for a public hearing was provided. However, a public hearing was not requested. The public comment period was from December 26, 1984, to March 13, 1985. Ten comment letters were received concerning issues relative to the proposed revisions and to the conclusions drawn as a result of the review. The comments have been carefully considered and, where determined to be appropriate by the Administrator, changes have been made in the proposed revisions.

IV. Major Comments Received and Changes to the Proposed Revisions

The Agency received two major comments on the proposed monitoring and recordkeeping requirements for mercury-cell chlor-alkali plants. Chlor-alkali plant representatives commented that the standards should allow submittal (to the Administrator) of plant-specific compliance plans as an alternative to the proposed monitoring requirements. Various reasons supporting such a provision were provided by the commenters (and are summarized in section 2.1 of the review document). In response to these comments, the standards were revised to provide for the option of submittal of alternative plant-specific monitoring plans. Owners and operators who elect to submit such plans must adhere to the seven guidelines stated in § 61.55(c) of the regulation. The monitoring plan must ensure not only compliance with the emission limits but also proper operation and maintenance of emissions control systems.

Several commenters believed that the requirement to record all incidences of mercury leaks or spills should be changed to require recording only incidences of unpredictable or significant leaks or spills that require immediate corrective actions. While the Agency agrees that the leaks or spills of primary interest are those that are "significant," neither the Agency nor representatives from several chlor-alkali companies could offer an acceptable definition of a "significant" leak or spill. Without such a definition, the commenters' request could not be adopted.

One major comment was received in the area of EPA's evaluation of indirect exposures to mercury emissions. The commenter claimed that the Agency's ambient air guideline of 1.0 microgram of mercury per cubic meter of air was based solely on the health effects of inhaled mercury and ignored exposures to mercury emissions that are deposited on land, water, or other surfaces. This commenter believed a re-evaluation of the ambient guideline level was warranted and that the re-evaluation should take into account total human exposures to mercury, including deposited mercury in its more toxic methylated forms.

As stated in section 2.5 of the review document, the Agency considered mercury exposures from dietary ingestion as well as from inhalation in setting the ambient air guideline level. The guideline level also includes a safety factor of ten. However, the effects of mercury emissions on other environments (such as drinking water) and the accumulation of methyl mercury in food (primarily fish) were not fully addressed in the NESHAP review. The EPA is presently reviewing available information concerning these effects, and studies are currently underway to gather the necessary data. These include studies of biochemical mechanisms (for example, the biochemical cycling of mercury) and health and environmental effects (for example, the bioaccumulation of methylmercury in fish) from the deposition of mercury. A preliminary report of the results of studies addressing the bioaccumulation of mercury in fish (the primary source of ingested mercury) is scheduled for 1989 with an integrated report on mercury bioaccumulation scheduled for 1992. As the results of these studies become available, the Agency will take action as appropriate. However, at this time, the Agency does not have a sufficient basis for revising the ambient guideline level.

One commenter believed the Agency should re-evaluate its decision not to regulate mercury emissions from power plants. This commenter believed the Agency should revise its calculations of mercury emissions to include coals with higher mercury contents than those assumed in the calculations. The commenter referred to reports of mercury concentrations in some American coals as high as 1.6 parts per million (ppm), a level four times higher than the concentration that was used in the Agency's analysis. He stated that the Agency cannot conclude that the ambient guideline will not be exceeded until an analysis of the ambient concentrations expected from plants burning high-mercury coals is completed.

The commenter also objected to EPA's approach to regulating toxic emissions from coal-fired boilers. He stated that by analyzing toxic components of boiler emissions one-by-one, there is a strong bias against control since only a fraction of the total health risk is compared with the total control cost. The commenter believed that EPA should abandon this approach and should require the use of particulate control techniques to capture all toxic emissions, including mercury.

To examine the potential for mercury emissions from coal-fired power plants to exceed the ambient air guideline, the Agency reviewed the data on the mercury content of coals available in the United States (Docket item IV-B-1). The highest mercury level reported for the 48 contiguous states is 8 parts per million (ppm) for subbituminous coal and 3.3 ppm for bituminous coal with an average of 0.1 ppm for subbituminous coal and 0.21 ppm for bituminous coal. The worst case estimates for a large 4000 megawatt (MW) coal-fired power plant firing 8 ppm subbituminous coal is 870 pounds of mercury per day. According to dispersion estimates, a 4000 MW plant emitting 790 pounds of mercury per day would cause a maximum ground level concentration of 1.0 $\mu g/m^3$. This indicates that in the extreme case a large coal-fired power plant could emit mercury at levels high enough to exceed the ambient guideline. However, typically, mercury emissions from coal-fired power plants are expected to be well below the ambient guideline level.

The Agency is currently studying the combined effect of identified trace element (including mercury) emissions from fossil-fuel combustion. For mercury, estimates are being made of nationwide emissions and of maximum concentrations associated with four sectors of coal burning: utility, industrial, commercial, and residential combustors. The results of this study will be used to determine the need and appropriate mechanism for regulating mercury emissions from fossil-fuel combustion.

Another major comment received pertained to mercury emissions from synthetic fuel processes. The commenter stated that there are data indicating that mercury emissions from oil shale retort operations can equal or exceed emissions from the currently regulated source categories. He believed these data demonstrate the need to set a national emission standard for mercury emissions from oil shale retorting and the need to examine the potential for mercury emissions from other synthetic fuel processes that are under active consideration.

At the present time there is only one retort plant in operation in the United States that is capable of processing more than 100 tons per day of raw shale to produce crude oil. Estimates of mercury emissions from this operation indicate that ambient mercury levels would be less than 0.04 $\mu g/m^3$, a level well below the ambient guideline level of 1.0 $\mu g/m^3$ (Docket item IV-A-2).

Construction of new retort operations or startup of existing plants that have been shut down is not anticipated in the near future. Furthermore, projections of mercury emissions from hypothetical commercial-scale operations indicate that emissions from a large size facility would still be below the ambient guideline level (Docket item IV-A-2).

In view of the low level of emissions from the oil shale retort that is currently in operation and the lack of anticipated growth in this industry in the near future, oil shale retorting operations are not being added as a source category to be regulated by the current mercury NESHAP. If oil shale retort operations become economically feasible, the Agency will review its decision not to regulate mercury emissions from these operations under these standards.

V. Administrative

The docket is an organized and complete file of all the information considered by EPA in the development of this rulemaking. The docket is a dynamic file, since material is added throughout the rulemaking development. The docketing system is intended to allow members of the public and industries involved to readily identify and locate documents so that they can effectively participate in the rulemaking process. Along with the statement of basis and purpose of the proposed and promulgated standards and EPA responses to significant comments, the contents of the docket, except for interagency review materials, will serve as the record in case of judicial review [section 307(d)(7)(A)].

As prescribed by section 112, the promulgation of these standards was preceded by the Administrator's earlier determination that mercury is a hazardous air pollutant. This determination was based on the finding that previously unregulated mercury emissions might cause or contribute to an increase in serious irreversible, or incapacitating reversible, illness. The intent of the standards is to protect the public health with an ample margin of safety. In accordance with section 117 of the Act, publication of these promulgated standards was preceded by consultation with appropriate advisory committees, independent experts, and Federal departments and agencies.

This regulation will be reviewed again 5 years from the date of this promulgation. This review will include an assessment of such factors as the need for integration with other programs, the existence of alternative control methods, enforceability, improvements in emission control technology, and reporting requirements.

Information collection requirements associated with this regulation (those included in 40 CFR Part 61, Subpart A and Subpart E) have been approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* and have been assigned OMB control number 2060-0097.

Under Executive Order 12291, EPA is required to judge whether a regulation is a "major rule" and therefore subject to the requirements of a regulatory impact analysis (RIA). The Agency has determined that this regulation would result in none of the adverse economic effects set forth in Section 1 of the Order as grounds for finding a regulation to be a "major rule." This regulation will not have an annual effect on the economy of $100 million or more, result in a major increase in costs or prices, or have significant adverse effects on competition, employment, investment productivity, or innovation. The Agency has, therefore, concluded that this regulation is not a "major rule" under Executive Order 12291.

The Regulatory Flexibility Act of 1980 requires the identification of potentially adverse impacts of Federal regulations upon a substantial number of small business entities. The Act specifically requires the completion of a Regulatory Flexibility Analysis in those instances where small business impacts are possible. None of the companies affected by these revisions meets the Small Business Administration definition of a small business, and thus, no regulatory flexibility analysis was required.

Pursuant to the provisions of 5 U.S.C. 605(b), I hereby certify that this rule will not have a significant economic impact on a substantial number of small entities.

List of Subjects in 40 CFR Part 61

Air pollution control, Asbestos, Beryllium, Hazardous substances, Mercury, Radionuclides, Reporting and recordkeeping requirements, Vinyl chloride.

Dated: March 11, 1987.

Lee M. Thomas,
Administrator.

PART 61—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

For reasons set out in the preamble, 40 CFR Part 61, Subpart E, is amended as set forth below.

1. The authority citation for Part 61 continues to read as follows:

Authority: 42 U.S.C. 7412, 7414, and 7601(a).

2. Section 61.53 is amended by revising paragraphs (a)(4), (b)(4), (c)(4), and (d)(5) to read as follows:

§ 61.53 Stack sampling.

(a) * * *

(4) All samples shall be analyzed and mercury emissions shall be determined within 30 days after the stack test. Each determination shall be reported to the Administrator by a registered letter dispatched within 15 calendar days following the date such determination is completed.

* * * * *

(b) * * *

(4) All samples shall be analyzed and mercury emissions shall be determined within 30 days after the stack test. Each determination shall be reported to the Administrator by a registered letter dispatched within 15 calendar days following the date such determination is completed.

* * * * *

(c) * * *

(4) An owner or operator may carry out approved design, maintenance, and housekeeping practices. A list of approved practices is provided in

Appendix A of "Review of National Emission Standards for Mercury," EPA-450/3-84-014a, December 1984. Copies are available from EPA's Central Docket Section, Docket item number A-84-41, III-B-1.

(d) * * *

(5) All samples shall be analyzed and mercury emissions shall be determined within 30 days after the stack test. Each determination shall be reported to the Administrator by a registered letter dispatched within 15 calendar days following the date such determination is completed.

* * * * *

3. Section 61.54 is amended by revising paragraph (f) to read as follows:

§ 61.54 Sludge sampling.

* * * * *

(f) All sludge samples shall be analyzed for mercury content within 30 days after the sludge sample is collected. Each determination shall be reported to the Administrator by a registered letter dispatched within 15 calendar days following the date such determination is completed.

* * * * *

4. Section 61.55 is amended by revising the title and paragraph (a) and by adding paragraphs (b), (c), and (d) as follows:

§ 61.55 Monitoring of emissions and operations.

(a) Wastewater treatment plant sludge incineration and drying plants. All the sources for which mercury emissions exceed 1,600 g per 24-hour period, demonstrated either by stack sampling according to § 61.53 or sludge sampling according to § 61.54, shall monitor mercury emissions at intervals of at least once per year by use of Method 105 of Appendix B or the procedures specified in § 61.53 (d) (2) and (4). The results of monitoring shall be reported and retained according to § 61.53(d) (5) and (6) or § 61.54 (f) and (g).

(b) Mercury cell chlor-alkali plants—hydrogen and end-box ventilation gas streams.

(1) The owner or operator of each mercury cell chlor-alkali plant shall, within 1 year of the date of publication of these amendments or within 1 year of startup for a plant with initial startup after the date of publication, perform a mercury emission test that demonstrates compliance with the emission limits in § 61.52, on the hydrogen stream by Reference Method 102 and on the end-box stream by Reference Method 101 for the purpose of establishing limits for parameters to be monitored.

(2) During tests specified in paragraph (b)(1) of this section, the following control device parameters shall be monitored, except as provided in paragraph (c) of this section, and recorded manually or automatically at least once every 15 minutes:

(i) The exit gas temperature from uncontrolled streams;

(ii) The outlet temperature of the gas stream for the final (i.e., the farthest downstream) cooling system when no control devices other than coolers and demisters are used;

(iii) The outlet temperature of the gas stream from the final cooling system when the cooling system is followed by a molecular sieve or carbon adsorber;

(iv) Outlet concentration of available chlorine, pH, liquid flow rate, and inlet gas temperature of chlorinated brine scrubbers and hypochlorite scrubbers;

(v) The liquid flow rate and exit gas temperature for water scrubbers;

(vi) The inlet gas temperature of carbon adsorption systems; and

(vii) The temperature during the heating phase of the regeneration cycle for carbon adsorbers or molecular sieves.

(3) The recorded parameters in paragraphs (b)(2)(i) through (b)(2)(vi) of this section shall be averaged over the test period (a minimum of 6 hours) to provide an average number. The highest temperature reading that is measured in paragraph (b)(2)(vii) of this section is to be identified as the reference temperature for use in paragraph (b)(6)(ii) of this section.

(4)(i) Immediately following completion of the emission tests specified in paragraph (b)(1) of this section, the owner or operator of a mercury cell chlor-alkali plant shall monitor and record manually or automatically at least once per hour the same parameters specified in paragraphs (b)(2)(i) through (b)(2)(vi) of this section.

(ii) Immediately following completion of the emission tests specified in paragraph (b)(1) of this section, the owner or operator shall monitor and record manually or automatically, during each heating phase of the regeneration cycle, the temperature specified in paragraph (b)(2)(vii) of this section.

(5) Monitoring devices used in accordance with paragraphs (b)(2) and (b)(4) of this section shall be certified by their manufacturer to be accurate to within 10 percent, and shall be operated, maintained, and calibrated according to the manufacturer's instructions. Records of the certifications and calibrations shall be retained at the chlor-alkali plant and made available for inspection by the Administrator as follows: Certification, for as long as the device is used for this purpose; calibration for a minimum of 2 years.

(6)(i) When the hourly value of a parameter monitored in accordance with paragraph (b)(4)(i) of this section exceeds, or in the case of liquid flow rate and available chlorine falls below the value of that same parameter determined in paragraph (b)(2) of this section for 24 consecutive hours, the Administrator is to be notified within the next 10 days.

(ii) When the maximum hourly value of the temperature measured in accordance with paragraph (b)(4)(ii) of this section is below the reference temperature recorded according to paragraph (b)(3) of this section for three consecutive regeneration cycles, the Administrator is to be notified within the next 10 days.

(7) Semiannual reports shall be submitted to the Administrator indicating the time and date on which the hourly value of each parameter monitored according to paragraphs (b)(4)(i) and (b)(4)(ii) of this section fell outside the value of that same parameter determined under paragraph (b)(3) of this section; and corrective action taken, and the time and date of the corrective action. Parameter excursions will be considered unacceptable operation and maintenance of the emission control system. In addition, while compliance with the emission limits is determined primarily by conducting a performance test according to the procedures in § 61.53(b), reports of parameter excursions may be used as evidence in judging the duration of a violation that is determined by a performance test.

(8) Semiannual reports required in paragraph (b)(7) of this section shall be submitted to the Administrator on September 15 and March 15 of each year. The first semiannual report is to be submitted following the first full 6 month reporting period. The semiannual report due on September 15 (March 15) shall include all excursions monitored through August 31 (February 28) of the same calendar year.

(c) As an alternative to the monitoring, recordkeeping, and reporting requirements in paragraphs (b)(2) through (8) of this section, an owner or operator may develop and submit for the Administrator's review and approval a plant-specific monitoring plan. To be approved, such a plan must ensure not only compliance with the emission limits of § 61.52(a) but also proper operation and maintenance of emissions control systems. Any site-specific monitoring plan submitted must, at a minimum, include the following:

(1) Identification of the critical parameter or parameters for the hydrogen stream and for the end-box ventilation stream that are to be monitored and an explanation of why the critical parameter(s) selected is the best indicator of proper control system performance and of mercury emission rates.

(2) Identification of the maximum or minimum value of each parameter (e.g., degrees temperature, concentration of mercury) that is not to be exceeded. The level(s) is to be directly correlated to the results of a performance test, conducted no more than 180 days prior to submittal of the plan, when the facility was in compliance with the emission limits of § 61.52(a).

(3) Designation of the frequency for recording the parameter measurements, with justification if the frequency is less than hourly. A longer recording frequency must be justified on the basis of the amount of time that could elapse during periods of process or control system upsets before the emission limits would be exceeded, and consideration is to be given to the time that would be necessary to repair the failure.

(4) Designation of the immediate actions to be taken in the event of an excursion beyond the value of the parameter established in 2.

(5) Provisions for reporting, semiannually, parameter excursions and the corrective actions taken, and provisions for reporting within 10 days any significant excursion.

(6) Identification of the accuracy of the monitoring device(s) or of the readings obtained.

(7) Recordkeeping requirements for certifications and calibrations.

(d) Mercury cell chlor-alkali plants—cell room ventilation system.

(1) Stationary sources determining cell room emissions in accordance with § 61.53(c)(4) shall maintain daily records of all leaks or spills of mercury. The records shall indicate the amount, location, time, and date the leaks or spills occurred, identify the cause of the leak or spill, state the immediate steps taken to minimize mercury emissions and steps taken to prevent future occurrences, and provide the time and date on which corrective steps were taken.

(2) The results of monitoring shall be recorded, retained at the source, and made available for inspection by the Administrator for a minimum of 2 years.

(Approved by the Office of Management and Budget under control number 2060-0097)

5. Section 61.56 is added to Subpart E to read as follows:

§ 61.56 Delegation of authority.

(a) In delegating implementation and enforcement authority to a State under section 112(d) of the Act, the authorities contained in paragraph (b) of this section shall be retained by the Administrator and not transferred to a State.

(b) Authorities which will not be delegated to States: Sections 61.53(c)(4) and 61.55(d). The authorities not delegated to States listed are in addition to the authorities in the General Provisions, Subpart A of 40 CFR Part 61, that will not be delegated to States (§§ 61.04(b), 61.12(d)(1), and 61.13(h)(1)(ii)).

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PREPARED BY THE

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Pennsylvania has made significant strides in controlling utility emissions of sulfur dioxide. Of the 9 scrubbers in Pennsylvania, 6 are within 25 miles of downtown Pittsburgh. Yet with all this behind us, the State as a whole is still one of the top 5 emitters of SO_2 in the Nation.

Because of the unique character of the State we had a number of problems with the President's bill. Some utilities that had already installed scrubbers were not given credit for previous efforts, or worse, due to the economic conditions for previous efforts, or worse, due to the economic conditions in the baseline years, they would not be given enough credit to run their clean plants. In addition, a utility that had hoped to shut down several old small units as a part of its compliance realized that it would not be able to use the allowances generated by the shutdown, and the plants that did need to do more to clean their emissions found that the bill's date and reduction targets limited their options in a way that would cost their customers much more money.

Each of these problems is now addressed. The provisions on baselines and credits for clean utilities will enable clean plants to run effectively. The trading and allowance provisions adopted in the committee will allow more flexibility for dirty plants. And many of the technical problems with the bill have been cleaned up including the removal of one clean plant in Pennsylvania that had mistakenly been added to the list of 107 plants for first phase reductions.

I would especially like to thank the conference committee for adopting several amendments, amendments I offered to promote development and use of clean coal technologies. With these additions, cleaning up the air and developing our Nation's most abundant form of domestic fossil energy are compatible. One amendment expanded the number of technologies eligible for special incentives from the five in the President's bill to any other boiler technology that achieves better pollution control of more than one pollutant and is more efficient than conventional boilers with a conventional scrubber.

My second amendment would allow a utility to comply using clean coal technology at a new site if the old plant is retired. This provision prevents the locking in of a utility at a site that should be abandoned or is too small when it repowers. Without this flexibility, the bill may discourage what is a commonsense compliance option.

Third, I offered an amendment that allows a utility which has tried and failed to comply with a clean coal technology to switch to another technology without penalty.

Finally, I want to thank the conference committee and particularly Mr. Dingell and Mr. Sharp for assisting my local utility, Duquesne Light and General Public Utilities costing western Pennsylvania 2,000 jobs.

It is a real tribute to many Members of Congress and to the President that this Clean Air Act bill is before the House after a 10-year stalemate. As a 12-year member of a core group that pressed to strengthen the law, I am pleased to have been a part of this historic effort to give us, our children, and our grandchildren cleaner air. There could hardly be a more basic commodity than the air we breathe. This is a big step toward preserving it--and preserving the planet.

Mr. OXLEY. Mr. Speaker, after more than a year of debate which culminates over a decade of work, we are about to cast the final vote on a major rewrite of the Clean Air Act. In 1977 when the Clean Air Act was last amended, it was assumed that Congress would amend this measure on a regular basis. However, for over 10 years, we could not narrow our differences, find middle ground, and pass a comprehensive clean air bill.

Last July, President Bush helped break the stalemate when he introduced the bill before us which includes provisions addressing industrial and automobile emissions, air toxics, and acid rain. Few environmental bills have been this complex or have the potential for disruption to our economy as this one. It pitted the environment against the economy, the East against the West, and one industry against another. To reconcile these issues, the conference committee had to make many difficult decisions.

I have been among the most skeptical about this bill because I wanted to ensure fairness to my home State of Ohio, particularly regarding the need for further acid rain controls and the benefits of those controls. Further, I wanted to provide clarity with the American people as to the costs of the bill. Conservative estimates indicate Americans will pay between $25 and $50 billion a year for cleaner air. To achieve this goal of improved health and welfare for our constituents, we will be asking them to pay the price through job losses, higher consumer product prices, high utility rates; in other words through changed life styles.

While this final bill is far from perfect, I believe we have come a long way toward the President's goal of balance and reasonableness. Underlying President Bush's clean air legislation was the desire to not only protect human health but to improve the quality of life of all Americans. It is my belief that this landmark legislation represents our best effort to negotiate a balance between the multitude of interests we represent and ensure that as a result, Americans will be better off, not worse off.

I am particularly pleased that we could blunt the impact on Ohio by including in the final agreement a provision which gives 200,000 additional allowances to Ohio, Indiana, and Illinois in phase I, and 50,000 new allowances to nine Midwestern States in phase II. We were also able to provide some assistance for two unique problems in my home State, the Zimmer plant, currently under construction, and Ohio Edison's small units which are the most costly and difficult to retrofit with scrubbers.

One of the key components of President Bush's bill was the concept of allowing the market to encourage reductions in pollution. This provision also caused divisions between the Midwest and the other States. To eliminate the argument that the Midwest would hoard allowances, and not give access to utilities in other States, I am happy to say that my proposal for auctioning allowances which was a part of the acid rain compromise adopted during consideration by the Energy and Commerce Committee has been retained by the conference. This mechanism will provide money to Midwest utilities faster and will also help to ensure that allowances are available to utilities across [sic]

Mr. Speaker, throughout the development of this legislation, we have worked to ensure that environmental progress does not jeopardize economic growth. We have added new environmental control requirements, but we have also tried to maintain flexibility in the permitting and review provisions of the bill, so that needed industrial modernization projects do not languish through months or years of permitting delay.

Of necessity, many of these issues have been left to EPA's discretion in implementing the legislation. This is true for such significant issues as the modification/de minimis provisions of section 182(c) (6)-(8) in title I; modification permit procedure provisions in section 112(g)(3); the so-called WEPCo issue in the acid rain title; and the permit flexibility provision of section 502. We fully anticipate that in addressing these issues after enactment, EPA will recognize the need for flexibility. This is not only a matter of economic importance; it serves important environmental purposes. We have presented industry with a tremendous challenge; we cannot take away from them the tools in terms of modernization and process changes, that will allow them to meet the challenge.

We have been careful to provide this flexibility in each of the title relating to stationary sources:

In title I, we have left the current netting and bubbling provisions unaffected in all but serious, severe and extreme areas. And even in those areas while we have lowered the de minimis threshold to 25 tons, we have tied the de minimis provisions of section 182(c)(6) to the modification provisions of section 182(c) (7) and (8).

In title III, we have included modifications as a separate category for review purposes, thus ensuring that existing sources can modify without triggering new source MACT. Just as importantly, we have structured the modification provisions so that sources need not await lengthy permit revisions or modifications before undertaking plant modifications.

In title IV, we have deleted all general provisions relating to the WEPCO modification issue. We did not in the contemplation that EPA will develop reasonable, revised Wepco regulations that will allow plants to add pollution control equipment, switch to cleaner fuels, and refurbish old facilities without running afoul of NSPS or PSD modifications issues.

In title V, we have explicitly provided permitting authorities with broad discretion to allow plant revisions without requiring permit modifications or revisions.

Mr. Speaker, following President Bush's lead, the final bill includes provisions which will require the use of clean fuels. Cleaner fuels will provide significant environmental benefit without putting even more stringent controls on automobiles. I am particularly pleased by the clean fuels program that struck a balance between oil and gas refiners, farmers, and the environment. The oxygenated fuels program will allow for the use of MTBE and ethanol as additives to achieve the required level of oxygen. The program will result in an increased demand of 600 million gallons of ethanol, creating a market for some 240 million bushels of corn. In turn, increased demand for corn will increase farm income and lower Federal farm program costs.

While title III addresses 189 toxic air pollutants and the control of those pollutants, I wish to focus on the provisions of the utility air toxics study, section 112(n) of the act as added by the conference agreement. With respect to air toxics generally, the Senate and House bills included provisions that differed substantially with respect to scientific studies, timing, and regulatory requirements. The House provision required that the EPA Administrator perform a 3-year study of the hazards to public health reasonably anticipated to occur as a result of emissions by electric utility steam generating units and report the results of that study to the Congress.

On the other hand, the Senate provision was the result of a complex, and ultimately unsatisfactory, set of negotiations. Unlike the House provision, scientific studies were not to serve as the basis for regulation, but simply were to be included in the docket of the regulatory process leading to regulations. Under the Senate provision, regulations for the control of particulates and mercury would have had to be promulgated no sooner or later than 5 years after enactment.

Rather than accept the Senate provision, the conference favored an approach that adopted the basic House provision. The provision did contain two constructive elements found in the Senate provision; a direction to the National Institute of Environmental Health Sciences to conduct a study on a mercury threshold below which adverse effects on human health are not expected to occur and the requirement that EPA study mercury emissions from all sources. The conferees agreed to the House provisions 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.

As we all know, the utility industry has been singled out for regulation under the acid rain provisions. The utility industry may also face additional controls for NO_x emissions for ozone control, and revised PM-10 controls. All of these programs will result in substantial reductions in emissions of conventional and potentially hazardous air pollutants. Even without all of these reductions in air pollution, the health risks from emissions of hazardous air pollutants from powerplants are vanishingly small, as EPA has repeatedly recognized.

Under the existing section 112 of the Clean Air Act, EPA has addressed the question whether additional regulation of powerplants is necessary to control air toxic emissions to protect the public health. EPA, thus far, has studied several substances for which emissions data and some indicator of toxicity exist: arsenic, beryllium, cadmium, hexavalent chromium, formaldehyde, and radionuclides. EPA found that additional regulation of emissions of these substances from powerplants was unnecessary. For some other substances listed in S. 1630, such as mercury and other volatile substances, little scientific evidence exists about either emissions rates or effects on public health or welfare. Under the conference agreement adopting the approach that the House included in its bill, these and other scientific issues will be examined, and regulations will be imposed only if warranted by the scientific evidence.

As I noted, the conferees changed only slightly the provision approved by the House. The changes to this provision, and other parts of the bill, clarified the nature of the studies to be conducted on emissions from powerplants and specifically exempted utility units from the provisions of section 112(c)(6), which addresses regulation of seven specified categories of substances.

In addition, section 112(n) provides that the Administrator shall regulate electric utility steam generating units if he finds, based on the studies, that regulation is appropriate and necessary. Under the conference agreement, if the Administrator regulates fossil fuel fired electric utility steam generating units by adopting any major source standard or any area source standard under section 112 for those units, he may do so only in compliance with subsection (n).

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 provisions of the act and any other Federal, State, or local regulation and voluntary emission reductions--have been demonstrated to cause a significant threat of serious adverse effects on the public health.

In sum, I believe that the conference committee produced a utility air toxics provision that will provide amply protection of the public health while avoiding the imposition of excessive and unnecessary costs on residential, industrial, and commercial consumers of electricity.

My next points are directed at title IV, the acid rain provisions. The conferees have decided to add 200,000 phase I and phase II allowances to the acid rain title, reflecting methodological errors by EPA. These additional allowances are a result of three basic errors that were made in calculating the emission reductions which would occur under the legislation. These mistakes are summarized below.

First, EPA underestimated 1980 utility emissions by failing to use the currently applicable sulfur-to-SO_2 conversion factor during coal combustion. In 1980, EPA assumed that 95 percent of the sulfur was emitted as SO_2, while the balance was retained in bottom ash, rejected in pulverizers, or captured by precipitators. In 1982, EPA revised its "Compilation of Air Pollutant Emission Factors (AP-42)" to indicate it estimated that 97.5 percent of the sulfur in boilers is emitted as SO_2. The 97.5 percent conversion factor was used in the 1985 emissions inventory. Had 97.5 percent been used in 1980, as advocated by NAPAP and DOE, emissions in 1980 would have been at least 180,000 tons higher.

Second, EPA, DOE, and NAPAP underestimated 1980 utility emissions by failing to account for scrubber operability in 1980. Each agency implicitly assumed that at scrubbed units, 31 GW in 1980, the scrubber operated 100 percent of the time that boilers operated, even though contemporaneous EPA contractor reports show that this was not the case. Scrubbers averaged only 80 percent operability in 1980, meaning that 20 percent of the time the boiler operated with uncontrolled emissions. This situation reflected the immaturity of scrubber technology. Had EPA accounted for this fact, EPA's emission estimate would have been 370,000 tons higher than it was.

Third, EPA underestimated 1980 nonutility emissions through reliance on a faulty data base. Using NAPA data--which is supported by DOE, was thoroughly peer reviewed, and conforms to the 1985 NAPAP emissions inventory--it is clear that actual 1980 nonutility emission were 400,000 tons greater in 1980 than EPA has acknowledged.

While these errors in aggregate represent nearly 1 million tons, it was a political decision to limit the size of additional allowance to 200,000 tons. It is important to remember that these extra allowances do not breach the goal set forth in the acid rain title to achieve a 10-million-ton reduction in SO_2 emissions from 1980 levels by the year 2000.

To achieve the most cost-effective SO_2 reductions, the bill contains a market based sulfur dioxide allowance trading system. I wish to address for a moment the importance of this system. If implemented as intended, these provisions can result in savings for electric utility customers while helping attain a substantial reduction of SO_2 by utilities. It has been estimated that 20 to 40 percent of the costs incurred under the traditional command and control approach to regulation, will be saved under the allowance system. The range of savings, however, depends upon the freedom granted utilities to buy and sell allowances. It is essential that we not stifle this new form of market with excessive or variable regulatory controls.

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The PRESIDING OFFICER. Without objection, it is so ordered.

(See exhibit 1.) [Exhibit 1 appears on p. 785.]

Mr. BURDICK. Mr. President, we agree that the utilization of a multipollutant control technology should not necessarily include replacement of the boiler to qualify as repowering technology.

Section 402(1) is intended to make clear that technologies eligible for repowering need not necessitate the replacement of the boiler. However, it is intended that all of the criteria are met, that "improvements in efficiency" not necessarily be equivalent to increases in efficiency, and the "multiple combustion emissions" to be controlled extend beyond the acid rain precursors and address other pollutions regulated under the act. Control approaches which string together otherwise separate processes--for instance scrubbers and electrostatic precipitators--should not qualify under the criteria of "controlling multiple combustion emissions simultaneously."

During the Senate consideration of S. 1630, the committee accepted an amendment to the definition of the term "repowering."

The amendment added a set of decision criteria so technologies other than those originally listed could qualify for the phase II time extension. This amendment is intended to encourage innovative technologies that can prevent or otherwise address many combustion pollutants (SO_2, NO_x and trace elements) simultaneously and in an integrated manner.

The intent of adding the criteria was to allow innovative technology, which may or may not require boiler replacement, to qualify if the criteria were met.

The House committee amended H.R. 3030 in a similar manner.

I am pleased the conference report carries this provision, based on the Senate language, and I am confident that new technology will be developed. This is particularly important to me for the future of the lignite coal mining industry in my State.

The conference report includes a number of provisions that will assure that industry and the Government, through the Federal Clean Coal Program, continue to move these technologies into the commercial marketplace as quickly as feasible.

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 mercury. The Senate bill required mercury reductions from coal-fired units. The Senate provision could not be sustained by the scientific facts. What little is known of mercury 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 mercury 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.

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CLEAN AIR ACT, AMENDMENTS

P.L. 101-549, see page 104 Stat. 2399

DATES OF CONSIDERATION AND PASSAGE

Senate : April 3, October 27, 1990
House: May 23, October 26, 1990

Senate Report (Environment and Public Works Committee) No. 101-228, Dec. 20, 1989
[To accompany S. 1630]

House Report (Energy and Commerce Committee) No. 101-490(I), May 17, 1990
[To accompany H.R. 3030]

House Report (Ways and Means Committee) No. 101-490(II), May 21, 1990
[To accompany H.R. 3030]

House Report (Public Works and Transportation Committee) No. 101-490(III), May 21, 1990
[To accompany H.R. 3030]

House Conference Report No. 101-952, Oct. 26, 1990
[To accompany S. 1630]

Cong. Record Vol. 136 (1990)

The Senate bill was passed in lieu of the House bill. The Senate Report (this page) is set out below, and the House Conference Report (page 3867) and the President's Signing Statement (page 3887-1) follow.

SENATE REPORT NO. 101-228

[page iii]

CONTENTS

Section 112 of the Clean Air Act adopted in 1970 requires EPA to list each hazardous air pollutant which is likely to cause an increase in death or serious illness. Within a year after listing EPA is to establish emissions standards which would apply to sources of the listed pollutant "providing an ample margin of safety to protect public health."

In the 18 years of administering section 112, EPA has listed only 8 pollutants: mercury, beryllium, asbestos, vinyl chloride, benezene, radionuclides, inorganic arsenic and coke oven emissions. No standard has been promulgated for coke oven emissions and for many of the other pollutants only a few of the source categories emitting the substance are actually regulated. For instance, mercury is a listed substance, but mercury emissions from powerplant boilers (exempt from standards) are contributing to high mercury levels in the flesh of fish taken in the Great Lakes region.

While EPA has listed only eight substances for regulation, a handful of States with active air toxics programs developed on their own have set standards for 708 substances. In 1983 and upon his return to EPA, William Ruckelshaus committed to make decisions within one year on approximately 25 toxic air pollutants that had been under review since 1977. Subsequently EPA decided that 14 of the substances did not require regulation, that 10 may be listed at some point in the future, and that 1 (coke oven emissions) was to be listed.

In 1985 EPA announced a new air toxics strategy shifting the focus from the regulation of hazardous air pollutants under section 112, to actions under other laws and by the States. The 1985 strategy elevated concern for emissions from the small, area sources like automobiles, dry cleaners, and small combustion units. One action announced in the strategy has been completed—a new source performance standard for wood stoves, but few of the other elements proposed have been implemented.

In 1987 the Court of Appeals for the District of Columbia reviewed decisions made by EPA with respect to vinyl chloride emissions. As with actions on other standards, EPA had considered cost in a decision to withdraw vinyl chloride standards that had been proposed during the later 1970s. The Court found that cost cannot be considered when establishing a safe level of exposure to toxic air pollutants. It is only in determining the margin of safety that EPA is authorized to consider cost and other factors. Because cost had

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been considered in several of the other hazardous air pollutant standards established by the Agency, five of the seven standards that had been issued may be reconsidered. The first proposed revisions for radionuclides were issued in the fall of 1989.

Recently, EPA began consideration of a new air toxics strategy that would again shift the focus of the program, this time from individual polllutants to source categories. The Agency has screened some 900 pollutants and 360 source categories to establish priorities for regulation, identifying 27 source categories as high-priorities for review. But the legal status of such a policy is in doubt, since the current law requires pollutants rather than source categories to be listed and also requires all sources of every listed pollutant to be controlled. Regulation of high priority source categories would necessarily trigger actions on other sources of lower priority hampering the efficiency of a program already short on resources.

Considering this record of false starts and failed opportunities, several conclusions are warranted:

I. Routine and episodic releases of hundreds of noncriteria air pollutants pose a significant threat to public health in the United States.

II. The risk of adverse health effects, principally excess cancers, from exposurse to toxic air pollutants is not distributed evenly across the population. Americans living within the vicinity of concentrated industrial activity or in heavily polluted urban areas may face relatively high risks.

III. Air toxics may also be causing significant environmental damage through deposition and run-off to surface waters, bioaccumulation in the food chain, or disruption of climatic or atmospheric processes.

IV. The Environmental Protection Agency has not made sufficient use of the existing authorities available under section 112 of the Clean Air Act to protect public health.

V. To some extent the statutory language itself may be responsible for the slow pace of the Nation's air toxics program as it requires emissions standards which provide an ample margin of safety to protect public health even for carcinogenic air pollutants where no level of exposure may be considered safe. If interpreted to require standards prohibiting emissions, regulations under section 112 would be potentially very costly for some source categories or pollutants.

VI. The regulatory time frames included in the existing law requiring the proposal of emissions standards within 180 days of listing a pollutant as hazardous and promulgation of standards 180 days later are unrealistic.

VII. A recent court decision nullified basic premises used by the Agency in the standard-setting process for hazardous air pollutants. Although listing and regulatory decisions had been scheduled for several other pollutants in the near-term, this decision is likely to cause additional significant delay as the Agency reassesses its basic policies.

VIII. Some measures proposed by the Agency in its 1985 air toxics strategy offer promise for addressing non-traditional sources of toxic air emissions. However, those proposals are not currently recognized within the structure of section 112 and have no other statutory authorization.

There is now a broad consensus that the program to regulate hazardous air pollutants under section 112 of the Clean Air Act should be restructured to provide EPA with authority to regulate industrial and area source categories of air pollution (rather than the pollutants) with technology-based standards in the near term.

In light of these conclusions, the reported legislation makes fundamental changes in the basic provisions of section 112 of the Clean Air Act. The bill establishes a list of 191 air pollutants and a mandatory schedule for issuing emissions standards for the major sources of these pollutants. The standards are to be based on the maximum reduction in emissions which can be achieved by application of best available control technology. These new, technology-based standards will become the principal focus of activity under section 112. Authority to issue health-based standards is preserved in modified form to be used for especially serious pollution problems.

This approach to regulation of toxic pollutants is not without precedent. It follows the general model which has been employed since the mid-1970's to control toxic effluents discharged to surface waters by major industrial point sources.

Under the 1972 amendments to the Clean Water Act, industrial dischargers were given two deadlines to control *conventional* pollutants (biological oxygen demand, suspended solids, and acidity): 1) by July 1, 1977 each facility was required to meet emissions limitations reflecting "best practicable control technology currently available" (so-called BPT limits); and 2) by July 1, 1983 each facility was to meet emissions limitations set according to "best available technology economically achievable" (BAT).

Toxic pollutants under the 1972 Act were to be treated differently. The Administrator was to publish a list of toxic pollutants within 90 days and within a year promulgate effluent standards that would provide an "ample margin of safety" to protect the most affected (aquatic) organisms. Thus, the structure of this authority to regulate toxic discharges to surface waters was very similar to the current structure of section 112 of the Clean Air Act.

During the five-year period following passage of the 1972 Clean Water Act, EPA promulgated standards for only six toxic pollutants. In 1975 the Environmental Defense Fund and the Natural Resources Defense Council brought suit against the Agency for failure to list more toxics and to promulgate standards as mandated by the Act. In June 1976, EPA and the plantiffs entered into a consent decree that established a new formula for the development of effluent standards for toxic water pollutants. This agreement created a list of 120 priority pollutants and required EPA to promulgate effluent guidelines based on best available control technology for each pollutant and each industrial category not later than December 31, 1980. Industrial dischargers were to be in compliance with these standards by July 1, 1983, the same deadline as established by the Act for BAT control of conventional pollutants. There were 14,000 dischargers divided into 21 industrial categories and 399 subcategories potentially subject to these new toxics standards.

CERTIFICATE OF SERVICE

I hereby certify that on this 3rd day of August, 2007, two copies of the foregoing Errata were served by first-class mail, postage prepaid to the following persons:

Jon M. Lipschultz
Eric G. Hostetler
Wendy Lynn Blake
U.S. Department of Justice
Environment and Natural Resources Division
PO Box 23986
L'Enfant Plaza Station
Washington, DC 20026-3986
For Respondent EPA

Jean P. Reilly, Deputy Attorney General
Christopher D. Ball, Deputy Attorney General
Christine F. Lewis, Deputy Attorney General
Jung W. Kim, Deputy Attorney General
Amy C. Donlon, Deputy Attorney General
R.J. Hughes Justice Complex
25 Market Street, PO Box 093
Trenton, New Jersey 08625

Patrick C. Lynch, Attorney General
Terence J. Tierney, Asst. Attorney General
150 South Main Street,
Providence, RI 02903

Bill Lockyer, Attorney General
Susan Durbin, Deputy Attorney General
California Department of Justice
1300 I Street
PO Box 944255
Sacramento, California 94244-2550

Alan F. Hoffman
Asst. Attorney General's Office
State of Michigan
Box 30217
Lansing, MI 48909
For Michigan DEQ

Lawrence E. Long, Attorney General
Roxanne Giedd, Deputy Attorney General
500 East Capitol Street
Pierre, SD 57501-5070

Richard Blumenthal, Attorney General
Matthew Levine, Assistant Attorney General
PO Box 120
55 Elm Street
Hartford, Connecticut 06141-0120

G. Steven Rowe, Attorney General
Gerald Reid, Assistant Attorney General
Department of the Attorney General
State House Station #6
Augusta, Maine 04333-0006

Martha Coakley, Attorney General
William L. Pardee, Asst. Attorney General
Environmental Protection Division
1 Ashburton Place, Suite 1813
Boston, Massachusetts 02108

Kelly A. Ayotte, Attorney General
Maureen D. Smith, Asst. Attorney General
Office of the Attorney General
33 Capitol Street
Concord, New Hampshire 03301-6397

Gary King, Attorney General
Christopher D. Coppin, Special Counsel
Stephen R. Farris, Assistant Attorney General
Karen Fisher, Assistant Attorney General
New Mexico Attorney General's Office
PO Drawer 1508
Santa Fe, New Mexico 87504

Andrew M. Cuomo, Attorney General
Peter Lehner, Assistant Attorney General
Jared Snyder, Assistant Attorney General
Jacob Hollinger, Assistant Attorney General
Environmental Protection Bureau
The Capitol
Albany, New York 12224

William H. Sorrell, Attorney General
Kevin O. Leske, Assistant Attorney General
Office of the Attorney General
109 State Street
Montpelier, Vermont 05609-1001

Susan Shinkman, Chief Counsel
Robert A. Reiley, Assistant Counsel
Richard Mather, Sr., Deputy Chief Counsel
Penn. Dept. of Env. Protection
PO Box 8464
Harrisburg, PA 17105

Patrick Crank, Attorney General
Nancy Vehr, Assistant Attorney General
123 Capitol Building
Cheyenne, WY 82002

Kathy Kinsey
Judah Prero
Assistant Attorneys General
Maryland Department of the Environment
1800 Washington Blvd., Suite 6048
Baltimore, Maryland 21230

M. Jane Brady, Attorney General
Valerie Csizmadia, Deputy Attorney General
102 West Water Street, Third Floor
Dover, DE 19904

J.B. Van Hollen, Attorney General
Thomas J. Dawson, Asst. Attorney General
State of Wisconsin
PO Box 7857
Madison, WI 53707-7857

Ann Alexander, Attorney General
Gerald T. Karr
State of Illinois
188 West Randolph Street, 20th Floor
Chicago, IL 60601

Lori Swanson, Attorney General
Allan C. Williams, Assistant Attorney General
State of Minnesota
445 Minnesota Avenue
Bremer Tower, Suite 900
St. Paul, MN 55101-2127

Milt E. Belcher, Assistant Attorney General
Alabama Attorney General's Office
11 South Union Street
Montgomery, Alabama 36130-0152

Steve Carter, Attorney General
Thomas M. Fisher, Solicitor General
State of Indiana
302 West Washington Street
Indianapolis, IN 46204-2770

Wayne Stenehjem, Attorney General
Lyle Witham, Asst. Attorney General
State of North Dakota
600 East Boulevard Avenue
Bismarck, ND 58505-2210

Jon C. Bruning, Attorney General
2115 State Capitol
Lincoln, NE 68509-8920

Paul M. Seby, Special Assistant Attorney General
McKenna, Long & Aldridge LLP
1875 Lawrence St., Suite 200
Denver, CO 80202

Douglas Jonathan Luckerman
Law Office of Douglas J. Luckerman
20 Outlook, Drive
Lexington, MA 02421
For Aroostook Band of Mimac Indians, Houlton Band of Maliseet Indians, Penobscot Indian Nation, the Passamaquoddy Tribe at Pleasant Point, and the Passamaquoddy Tribe at Indian Township

Riyaz A. Kanji
KANJI & KATZEN, PLLC
101 North Maine Street
Suite 555
Ann Arbor, Michigan 48104
For National Congress of American Indians and certain Individual Treaty Tribes

Scott Edwards, Esq., Legal Director
Waterkeeper Alliance
50 South Buckhout Street
Irvington, New York 10533
914.674.0622, ext. 13
For Chesapeake Bay Foundation and Waterkeeper Alliance

Mark J. Rudolph
Senior Counsel
Office of Legal Services
West Virginia Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304

Bradford Kuster, Esq.
New Hampshire Advocacy Center
27 North Main Street
Concord, NH 03301-4930
For Conservation Law Foundation

James Samuel Pew
Earthjustice Legal Defense Fund
1625 Massachusetts Avenue, NW
Suite 702
Washington, DC 20036
For Environmental Defense, National Wildlife

Ann Brewster Weeks
Jonathan Frederick Lewis
18 Tremont Street, Suite 530
Boston, MA 02108
For Natural Resources Council of Maine, Ohio Environmental Council and U.S. PIRG

Federation, and Sierra Club

Jon Pirie Devine, Jr.
Natural Resources Defense Council
1200 New York Avenue, NW, Suite 400
Washington, DC 20005
For Natural Resources Defense Council

Ralph S. Tyler, III, City Solicitor
Shari T. Wilson
Dawn S. Lettman
Joshua Neal Auerbach
Baltimore City Department of Law
100 Holliday Street
Suite 101, City Hall
Baltimore MD 21202
For the City of Baltimore

Neal John Cabral
Stewart Todd Leeth
McGuireWoods
One James Center, 901 East Cary Street
Richmond, VA 23219-4030
For American Coal for Balanced Mercury Regulation, Alabama Coal Association, Coal Operators & Associates, Inc., Maryland Coal Association, Ohio Coal Association, and Pennsylvania Coal Association

James B. Vasile
Brian Randel Gish
Davis, Wright Tremaine LLP
1500 K Street
Suite 450
Washington, DC 20005-1272
For Alaska Industrial Development and Export Authority

Charles Knauss
Robert Zener
BINGHAM MCCUTCHEON LLP
2020 K Street, NW
Washington, DC 20006
For Producers for Electric Reliability

Jon A. Mueller
Chesapeake Bay Foundation
6 Herndon Ave.
Annapolis, MD 21403

John Duval Walke
Natural Resources Defense Council
1200 New York Avenue, NW
Suite 400
Washington, DC 20005
For Natural Resources Defense Council; Ohio Environmental Council

Carol A. Fizpatrick
Bart E. Cassidy
Manko, Gold & Katcher
40 City Avenue, Suite 500
Bala Cynwyd, PA 19004
For ARIPPA

Judith Ellen Rivlin
Grant F. Crandall
United Mine Workers of America
8315 Lee Highway
Fairfax, VA 22301-2215
For United Mine Workers of America

Peter Glaser
Troutman and Sanders LLP
401 9th Street, NW, Suite 1000
Washington, DC 20004-2134
For the National Mining Association

Leah Walker Casey
Carter, Conboy, Case, Blackmore
Maloney & Laird, PC
20 Corporate Woods Boulevard
Albany, NY 12211-2362
For Adirondack Mountain Club

Peter H. Wyckoff
Pillsbury Winthrop Shaw Pittman LLP
2300 N Street, NW
Washington, DC 20037
For Duke Energy Indiana, Inc., Duke Energy Kentucky, Inc., and Duke Energy Ohio, Inc.

Harold Patrick Quinn, Jr.
National Mining Association
101 Constitution Avenue, NW
Suite 500 East
Washington, DC 20001

John Timothy Suttles, Jr.
Southern Environmental Law Center
200 West Franklin Street
Suite 330
Chapel Hill, NC 27516
For Physicians for Social Responsibility, American Nurses Assoc. and the American Public Health Assoc.

William M. Bumpers
Debra J. Jezouit
Baker Botts, L.L.P.
1299 Pennsylvania Ave., NW
Washington, DC 20004-2400
For PPL Corporation, PSEG Fossil LLC, NRG Inc., and Florida Power & Light Company

Henri D. Bartholomot
Edison Electric Institute
701 Pennsylvania Avenue, NW
Washington, DC 20004
For the Edison Electric Institute

Joseph C. Stanko
David G. Scott
Hunton & Williams LLP
1900 K Street,
Washington, DC 20006
For West Associates

Daniel J. Popeo
Paul D. Kamenar
Washington Legal Foundation
2009 Massachusetts Avenue, NW
Washington, DC 20036

Lee B. Zeugin

Lee B. Zeugin