ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 60 and 63

[EPA–HQ–OAR–2002–0051; FRL–8898–1]

RIN 2060–AO15

National Emission Standards for Hazardous Air Pollutants From the Portland Cement Manufacturing Industry

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: EPA is proposing amendments to the current National Emission Standards for Hazardous Air Pollutants (NESHAP) from the Portland Cement Manufacturing Industry. These proposed amendments would add or revise, as applicable, emission limits for mercury, total hydrocarbons (THC), and particulate matter (PM) from kilns and in-line kiln/raw mills located at a major or an area source, and hydrochloric acid (HCl) from kilns and in-line kiln/raw mills located at major sources. These proposed amendments also would remove the following four provisions in the current regulation: the operating limit for the average hourly recycle rate for cement kiln dust; the requirement that cement kilns only use certain type of utility boiler fly ash; the opacity limits for kilns and clinker coolers; and the 50 parts per million volume dry (ppmvd) THC emission limit for new greenfield sources. EPA is also proposing standards which would apply during startup, shutdown, and operating modes for all of the current section 112 standards applicable to cement kilns.

Finally, EPA is proposing performance specifications for use of mercury continuous emission monitors (CEMS), which specifications would be generally applicable and so could apply to sources from categories other than, and in addition to, portland cement, and updating recordkeeping and testing requirements.

DATES: Comments must be received on or before July 6, 2009. If any one contacts EPA by May 21, 2009 requesting to speak at a public hearing, EPA will hold a public hearing on May 26, 2009. Under the Paperwork Reduction Act, comments on the information collection provisions are best assured of having full effect if the Office of Management and Budget (OMB) receives a copy of your comments on or before June 5, 2009.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ– OAR–2002–0051, by one of the following methods:

• *http://www.regulations.gov:* Follow the on-line instructions for submitting comments.

• *E-mail: a-and-r-docket@epa.gov.*

• *Fax:* (202) 566–9744.

• *Mail:* U.S. Postal Service, send comments to: EPA Docket Center (6102T), National Emission Standards for Hazardous Air Pollutant From the Portland Cement Manufacturing Industry Docket, Docket ID No. EPA– HQ–OAR–2002–0051, 1200 Pennsylvania Ave., NW., Washington, DC 20460. Please include a total of two copies. In addition, please mail a copy of your comments on the information collection provisions to the Office of Information and Regulatory Affairs, Office of Management and Budget (OMB), *Attn:* Desk Officer for EPA, 725 17th St., NW., Washington, DC 20503.

• *Hand Delivery:* In person or by courier, deliver comments to: EPA Docket Center (6102T), Standards of Performance (NSPS) for Portland Cement Plants Docket, Docket ID No. EPA–HQ–OAR–2007–0877, EPA West, Room 3334, 1301 Constitution Avenue, NW., Washington, DC 20004. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information. Please include a total of two copies.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OAR–2002– 0051. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http:// www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *http:// www.regulations.gov* or e-mail. The *http://www.regulations.gov* Web site is an ''anonymous access'' system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through *http:// www.regulations.gov,* your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

Docket: All documents in the docket are listed in the *http:// www.regulations.gov* index. Although listed in the index, some information is not publicly available, *e.g.,* CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *http:// www.regulations.gov* or in hard copy at the EPA Docket Center, National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry Docket, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Docket Center is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: Mr. Keith Barnett, Office of Air Quality Planning and Standards, Sector Policies and Programs Division, Metals and Minerals Group (D243–02), Environmental Protection Agency, Research Triangle Park, NC 27711, *telephone number:* (919) 541–5605; *fax number:* (919) 541–5450; *e-mail address: barnett.keith@epa.gov.*

SUPPLEMENTARY INFORMATION: The information presented in this preamble is organized as follows:

I. General Information

A. Does this action apply to me?

Categories and entities potentially regulated by this proposed rule include:

Category	NAICS code [1]	Examples of regulated entities
Industry	327310	Portland cement plants.
Federal government	....	Not affected.
State/local/tribal government	....	Portland cement plants.

[1] North American Industry Classification System.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. To determine whether your facility would be regulated by this proposed action, you should examine the applicability criteria in 40 CFR 63.1340 (subpart LLL). If you have any questions regarding the applicability of this proposed action to a particular entity, contact the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

B. What should I consider as I prepare my comments to EPA?

Do not submit information containing CBI to EPA through *http://www.regulations.gov* or e-mail. Send or deliver information identified as CBI only to the following address: Roberto Morales, OAQPS Document Control Officer (C404–02), Office of Air Quality Planning and Standards, Environmental Protection Agency, Research Triangle Park, NC 27711, Attention Docket ID No. EPA–HQ–OAR–2002–0051. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD–ROM that you mail to EPA, mark the outside of the disk or CD–ROM as CBI and then identify electronically within the disk or CD–ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI

must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

C. Where can I get a copy of this document?

In addition to being available in the docket, an electronic copy of this proposed action is available on the Worldwide Web (WWW) through the Technology Transfer Network (TTN). Following signature, a copy of this proposed action will be posted on the TTN's policy and guidance page for newly proposed or promulgated rules at *http://www.epa.gov/ttn/oarpg.* The TTN provides information and technology exchange in various areas of air pollution control.

D. When and where would a public hearing occur?

If anyone contacts EPA requesting to speak at a public hearing by May 21, 2009, a public hearing will be held on May 26, 2009. To request a public hearing contact Ms. Pamela Garrett, EPA, Office of Air Quality Planning and Standards, Sector Policy and Programs Division, Energy Strategies Group (D243–01), Research Triangle Park, NC 27711, telephone number 919–541–7966, *e-mail address: garrett.pamela@epa.gov* by the date specified above in the **DATES** section. Persons interested in presenting oral testimony or inquiring as to whether a public hearing is to be held should also

contact Ms. Pamela Garrett at least 2 days in advance of the potential date of the public hearing.

If a public hearing is requested, it will be held at 10 a.m. at the EPA Headquarters, Ariel Rios Building, 12th Street and Pennsylvania Avenue, Washington, DC 20460 or at a nearby location.

II. Background Information

A. What is the statutory authority for these proposed amendments?

Section 112(d) of the Clean Air Act (CAA) requires EPA to set emissions standards for Hazardous Air Pollutants (HAP) emitted by major stationary sources based on performance of the maximum achievable control technology (MACT). The MACT standards for existing sources must be at least as stringent as the average emissions limitation achieved by the best performing 12 percent of existing sources (for which the administrator has emissions information) or the best performing 5 sources for source categories with less than 30 sources (CAA section 112(d)(3)(A) and (B)). This level of minimum stringency is called the MACT floor. For new sources, MACT standards must be at least as stringent as the control level achieved in practice by the best controlled similar source (CAA section 112(d)(3)). EPA also must consider more stringent "beyond-the-floor" control options. When considering beyond-the-floor options, EPA must consider not only the maximum degree of reduction in

emissions of HAP, but must take into account costs, energy, and nonair environmental impacts when doing so.

Section 112(k)(3)(B) of the CAA requires EPA to identify at least 30 HAP that pose the greatest potential health threat in urban areas, and section 112(c)(3) requires EPA to regulate, under section 112(d) standards, the area source[1] categories that represent 90 percent of the emissions of the 30 "listed" HAP ("urban HAP"). We implemented these listing requirements through the Integrated Urban Air Toxics Strategy (64 FR 38715, July 19, 1999).[2]

The portland cement source category was listed as a source category for regulation under this 1999 Strategy based on emissions of arsenic, cadmium, beryllium, lead, and polychlorinated biphenyls. The final NESHAP for the Portland Cement Manufacturing Industry (64 FR 31898, June 14, 1999) included emission limits based on performance of MACT for the control of THC emissions from area sources. This 1999 rule fulfills the requirement to regulate area source cement kiln emissions of polychlorinated biphenyls (for which THC is a surrogate). However, EPA did not include requirements for the control of the non-volatile metal HAP (arsenic, cadmium, beryllium, and lead) from area sources in the 1999 rule or in the 2006 amendments. To fulfill our requirements under section 112(c)(3) and 112(k), EPA is thus proposing to set emissions standards for these metal HAP from portland cement manufacturing facilities that are area sources (using particulate matter as a surrogate). In this proposal, EPA is proposing PM standards for area sources based on performance of MACT.

Section 112(c)(6) requires EPA to list, and to regulate under standards established pursuant to section 112(d)(2) or (d)(4), categories of sources accounting for not less than 90 percent of emissions of each of seven specific HAP: alkylated lead compounds; polycyclic organic matter; hexachlorobenzene; mercury; polychlorinated byphenyls; 2,3,7,8-tetrachlorodibenzofurans; and 2,3,7,8-tetrachloroidibenzo-p-dioxin. Standards established under CAA 112(d)(2) must reflect the performance of MACT. "Portland cement manufacturing: non-hazardous waste kilns" is listed as a source category for regulation under section 112(d)(2) pursuant to the section 112(c)(6) requirements due to emissions of polycyclic organic matter, mercury, and dioxin/furans (63 FR 17838, 17848, April 10, 1998); see also 63 FR at 14193 (March 24, 1998) (area source cement kilns' emissions of mercury, dibenzo-p-dioxins and dibenzo-p-furans, polycyclic organic matter, and polychlorinated biphenyls are subject to MACT).

Section 129(a)(1)(A) of the Act requires EPA to establish specific performance standards, including emission limitations, for "solid waste incineration units" generally, and, in particular, for "solid waste incineration units combusting commercial or industrial waste" (section 129(a)(1)(D)).[3] Section 129 defines "solid waste incineration unit" as "a distinct operating unit of any facility which combusts any solid waste material from commercial or industrial establishments or the general public." Section 129(g)(1). Section 129 also provides that "solid waste" shall have the meaning established by EPA pursuant to its authority under the [Resource Conservation and Recovery Act]. Section 129(g)(6).

In *Natural Resources Defense Council* v. *EPA,* 489 F. 3d 1250, 1257–61 (D.C. Cir. 2007), the court vacated the Commercial and Industrial Solid Waste Incineration Units (CISWI) Definitions Rule, 70 FR 55568 (Sept. 22, 2005), which EPA issued pursuant to CAA section 129(a)(1)(D). In that rule, EPA defined the term "commercial or industrial solid waste incineration unit" to mean a combustion unit that combusts "commercial or industrial waste." The rule defined "commercial or industrial waste" to mean waste combusted at a unit that does not recover thermal energy from the combustion for a useful purpose. Under these definitions, only those units that combusted commercial or industrial waste and were not designed to, or did not operate to, recover thermal energy from the combustion would be subject to section 129 standards. The DC Circuit rejected the definitions contained in the CISWI Definitions Rule and interpreted the term "solid waste incineration unit" in CAA section 129(g)(1) "to unambiguously include among the incineration units subject to its standards any facility that combusts any commercial or industrial solid waste material at all—subject to the four statutory exceptions identified in [CAA section 129(g)(1).]" *NRDC* v. *EPA,* 489 F.3d 1250, 1257–58.

In response to the Court's remand and vacatur of the CISWI Definitions rule, EPA has initiated a rulemaking to define which secondary materials are "solid waste" for purposes of subtitle D (non-hazardous waste) of the Resource Conservation and Recovery Act when burned in a combustion unit. See Advance Notice of Proposed Rulemaking, 74 FR 41 (January 2, 2009) (soliciting comment on whether certain secondary materials used as alternative fuels or ingredients are solid wastes within the meaning of Subtitle D of the Resource Conservation and Recovery Act). That definition, in turn, would determine the applicability of section 129(a).

This definitional rulemaking is relevant to this proceeding because some portland cement kilns combust secondary materials as alternative fuels. However, there is no federal regulatory interpretation of "solid waste" for EPA to apply under Subtitle D of the Resource Conservation and Recovery Act, and EPA cannot prejudge the outcome of that pending rulemaking. Moreover, EPA has imperfect information on the exact nature of the secondary materials which portland cement kilns combust, such as information as to the provider(s) of the secondary materials, how much processing the secondary materials may have undergone, and other issues potentially relevant in a determination of whether these materials are to be classified as solid wastes. See 74 FR at 53–59. EPA therefore cannot reliably determine at this time if the secondary materials combusted by cement kilns are to be classified as solid wastes. Accordingly, EPA is basing all determinations as to source classification on the emissions information now available, as required by section 112(d)(3), and will necessarily continue to do so until the solid waste definition discussed above is promulgated. The current data base classifies all portland cement kilns as section 112 sources (*i.e.* subject to regulation under section 112). EPA notes, however, that the combustion of secondary materials as alternative fuels did not have any appreciable effect on the amount of HAP emitted by any source.[4]

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[1] An area source is a stationary source of HAP emissions that is not a major source. A major source is a stationary source that emits or has the potential to emit 10 tons per year (tpy) or more of any HAP or 25 tpy or more of any combination of HAP.

[2] Since its publication in the Integrated Urban Air Toxics Strategy in 1999, EPA has amended the area source category list several times.

[3] CAA section 129 refers to the Solid Waste Disposal Act (SWDA). However, this act, as amended, is commonly referred to as the Resource Conservation and Recovery Act (RCRA).

[4] Development of the MACT Floors for the Proposed NESHAP for Portland Cement. April 15, 2009.

B. Summary of the National Lime Association v. EPA Litigation

On June 14, 1999 (64 FR 31898), EPA issued the NESHAP for the Portland Cement Manufacturing Industry (40 CFR part 63, subpart LLL).[5] The 1999 final rule established emission limitations for PM as a surrogate for non-volatile HAP metals (major sources only), dioxins/furans, and for greenfield[6] new sources total THC as a surrogate for organic HAP. These standards were intended to be based on the performance of MACT pursuant to sections 112(d)(2) and (3). We did not establish limits for THC for existing sources and non-greenfield new sources, nor for HCl or mercury for new or existing sources. We reasoned that emissions of these constituents were a function of raw material concentrations and so were essentially uncontrolled, the result being that there was no level of performance on which a floor could be based. EPA further found that beyond the floor standards for these HAP were not warranted.

Ruling on petitions for review of various environmental groups, the DC Circuit held that EPA had erred in failing to establish section 112(d) standards for mercury, THC (except for greenfield new sources) and hydrochloric acid. The court held that ''[n]othing in the statute even suggests that EPA may set emission levels only for those * * * HAPs controlled with technology.'' *National Lime Ass'n* v. *EPA,* 233 F. 3d 625, 633 (DC Cir. 2000). The court also stated that EPA is obligated to consider other pollution-reducing measures such as process changes and material substitution. *Id.* at 634. Later cases go on to hold that EPA must account for levels of HAP in raw materials and other inputs in establishing MACT floors, and further hold that sources with low HAP emission levels due to low levels of HAP in their raw materials can be considered best performers for purposes of establishing MACT floors. See, *e.g., Sierra Club* v. *EPA* (Brick MACT), 479 F. 3d 875, 882–83 (DC Cir. 2007).[7]

C. EPA's Response to the Remand

In response to the *National Lime Ass'n* mandate, on December 2, 2005, we proposed standards for mercury, THC, and HCl. (More information on the regulatory and litigation history may be found at 70 FR 72332, December 2, 2005.) We received over 1,700 comments on the proposed amendments. Most of these comments addressed the lack of a mercury emission limitation in the proposed amendments. On December 20, 2006 (71 FR 76518), EPA published final amendments to the national emission standards for these HAP. The final amendments contain a new source standard for mercury emissions from cement kilns and kilns/in-line raw mills of 41 micrograms per dry standard cubic meter, or alternatively the application of a limestone wet scrubber with a liquid-to-gas ratio of 30 gallons per 1,000 actual cubic feet per minute of exhaust gas. The final rule also adopted a standard for new and existing sources banning the use of utility boiler fly ash in cement kilns where the fly ash mercury content has been increased through the use of activated carbon or any other sorbent unless the cement kiln seeking to use the fly ash can demonstrate that the use of fly ash will not result in an increase in mercury emissions over its baseline mercury emissions (*i.e.,* emissions not using the mercury-laden fly ash). EPA also issued a THC standard for new cement kilns (except for greenfield cement kilns that commenced construction on or before December 2, 2005) of 20 parts per million (corrected to 7 percent oxygen) or 98 percent reduction in THC emissions from uncontrolled levels. EPA did not set a standard for HCl, determining that HCl was a pollutant for which a threshold had been established, and that no cement kiln, even under worst-case operating conditions and exposure assumptions, would emit HCl at levels that would exceed that threshold level, allowing for an ample margin of safety.

D. Reconsideration of EPA Final Action in Response to the Remand

At the same time we issued the final amendments, EPA on its own initiative made a determination to reconsider the new source standard for mercury, the existing and new source standard banning cement kiln use of certain mercury-containing fly ash, and the new source standard for THC (71 FR 76553, December 20, 2006). EPA granted reconsideration of the new source mercury standard both due to substantive issues relating to the

performance of wet scrubbers and because information about their performance in the industry had not been available for public comment at the time of proposal but is now available in the docket. We also committed to undertake a test program for mercury emissions from cement kilns equipped with wet scrubbers that would enable us to resolve these issues. We further explained that we were granting reconsideration of the work practice requirement banning the use of certain mercury-containing fly ash in cement kilns to allow further opportunity for comment on both the standard and the underlying rationale and because we did not feel we had the level of analysis we would like to support a beyond-the-floor determination. We granted reconsideration of the new source standard for THC because the information on which the standard was based arose after the period for public comment. We requested comment on the actual standard, whether the standard is appropriate for reconstructed new sources (if any should occur) and the information on which the standard is based. We specifically solicited data on THC emission levels from preheater/precalciner cement kilns. We stated that we would evaluate all data and comments received, and determine whether in light of those data and comments it is appropriate to amend the promulgated standards.

EPA received comments on the notice of reconsideration from two cement companies, three energy companies, three industry associations, a technical consultant, one State, one environmental group, one ash management company, one fuels company, and one private citizen. As part of these comments, one industry trade association submitted a petition to withdraw the new source MACT standards for mercury and THC and one environmental group submitted a petition for reconsideration of the 2006 final action. A summary of these comments is available in the docket for this rulemaking.[8]

In addition to the reconsideration discussed above, EPA received a petition from Sierra Club requesting reconsideration of the existing source standards for THC, mercury, and HCl, and judicial petitions for review challenging the final amendments. EPA granted the reconsideration petition. The judicial petitions have been

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[5] Cement kilns which burn hazardous waste are a separate source category, since their emissions of many HAP differ from portland cement kilns' as a result of the hazardous waste inputs. Rules for hazardous waste-burning cement kilns are found at subpart EEE of part 63.

[6] For purposes of the 1999 rule a new greenfield kiln is a kiln constructed after March 24, 1998, at a site where there are no existing kilns.

[7] In the remainder of the opinion, the court in *National Lime Ass'n* upheld EPA's standards for particulate matter and dioxin (on grounds that petitioner had not properly raised arguments in its opening brief), upheld EPA's use of particulate matter as a surrogate for HAP metals, and remanded for further explanation EPA's choice of an analytic method for hydrochloric acid.

[8] Summary of Comments on December 20, 2006 Final Rule and Notice of Reconsideration. April 15, 2009.

combined and are being held in abeyance pending the results of the reconsideration.

In March 2007 the DC Circuit court issued an opinion (*Sierra Club* v. *EPA,* 479 F. 3d 875 (DC Cir. 2007) (*Brick MACT*)) vacating and remanding section 112(d) MACT standards for the Brick and Structural Clay Ceramics source categories. Some key holdings in that case were:

• Floors for existing sources must reflect the average emission limitation achieved by the best-performing 12 percent of existing sources, not levels EPA considers to be achievable by all sources (479 F. 3d at 880–81);

• EPA cannot set floors of "no control." The Court reiterated its prior holdings, including National Lime Ass'n, confirming that EPA must set floor standards for all HAP emitted by the major source, including those HAP that are not controlled by at-the-stack control devices (479 F. 3d at 883);

• EPA cannot ignore non-technology factors that reduce HAP emissions. Specifically, the Court held that "EPA's decision to base floors exclusively on technology even though non-technology factors affect emissions violates the Act." (479 F. 3d at 883)

Based on the *Brick MACT* decision, we believe a source's performance resulting from the presence or absence of HAP in raw materials must be accounted for in establishing floors; i.e., a low emitter due to low HAP proprietary raw materials can still be a best performer. In addition, the fact that a specific level of performance is unintended is not a legal basis for excluding the source's performance from consideration. *National Lime Ass'n,* 233 F. 3d at 640.

The *Brick MACT* decision also stated that EPA may account for variability in setting floors. However, the court found that EPA erred in assessing variability because it relied on data from the worst performers to estimate best performers' variability, and held that "EPA may not use emission levels of the worst performers to estimate variability of the best performers without a demonstrated relationship between the two." 479 F. 3d at 882.

The majority opinion in the *Brick MACT* case does not address the possibility of subcategorization to address differences in the HAP content of raw materials. However, in his concurring opinion Judge Williams stated that EPA's ability to create subcategories for sources of different classes, size, or type (section 112 (d)(1)) may provide a means out of the situation where the floor standards are

achieved for some sources, but the same floors cannot be achieved for other sources due to differences in local raw materials whose use is essential. *Id.* at 884–85.[9]

After considering the implications of this decision, EPA granted the petition for reconsideration of all the existing source standards in the 2006 rulemaking.

A second court opinion is also relevant to this proposal. In *Sierra Club* v. *EPA*, 551 F. 3d 1019 (DC Cir. 2008) the court vacated the regulations contained in the General Provisions which exempt major sources from MACT standards during periods of startup, shutdown and malfunction (SSM)). The regulations (in 40 CFR 63.6(f)(1) and 63.6(h)(1)) provided that sources need not comply with the relevant section 112(d) standard during SSM events and instead must "minimize emissions * * * to the greatest extent which is consistent with safety and good air pollution control practices." The current Portland Cement NESHAP does not contain specific provisions covering operation during SSM operating modes; rather it references the now-vacated rules in the General Provisions. As a result of the court decision, we are addressing them in this rulemaking. Discussion of this issue may be found in Section IV.G.

III. Summary of Proposed Amendments to Subpart LLL

This section presents the proposed amendments to the Portland Cement NESHAP. In the section presenting the amended rule language, there is some language that it not amendatory, but is presented for the reader's convenience. We are not reopening or otherwise considering unchanged rule language presented for the reader's convenience, and will not accept comments on such language.

A. Emissions Limits

We are proposing the following new emission limits in this action categorized below by their sources in a typical Portland cement production process.

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[9] "What if meeting the 'floors' is extremely or even prohibitively costly for particular plants because of conditions specific to those plants (*e.g.*, adoption of the necessary technology requires very costly retrofitting, or the required technology cannot, given local inputs whose use is essential, achieve the 'floor')? For these plants, it would seem that what has been 'achieved' under § 112(d)(3) would not be 'achievable' under § 112(d)(2) in light of the latter's mandate to EPA to consider cost. * * * [O]ne legitimate basis for creating additional subcategories must be the interest in keeping the relation between 'achieved' and 'achievable' in accord with common sense and the reasonable meaning of the statute. " *Id.* at 884–85

Kilns and In-line Kiln/Raw Mills

Mercury. For cement kilns or in-line kilns/raw mills an emissions limit of 43 lb/million(MM) tons clinker for existing sources and 14 lb/MM tons clinker for new sources. Both proposed limits are based on a 30 day rolling average.

THC. For cement kilns or in-line kilns/raw mills an emissions limit of 7 parts per million by volume (ppmv) for existing sources and 6 ppmv for new sources, measured dry as propane and corrected to 7 percent oxygen, measured on a 30 rolling day average in each case. Because the proposed existing source standard would be more stringent than the new source standard of 50 ppmv contained in the 1999 final rule for greenfield new sources, we are also proposing to remove the 50 ppmv standard.

As an alternative to the THC standard, we are proposing that the cement kilns or in-line kilns/raw mills can meet a standard of 2 ppmv total combined organic HAP for existing sources or 1 ppmv total organic HAP combined for new sources, measured dry and corrected to 7 percent oxygen. We believe this standard is equivalent to the proposed THC standard as discussed in section IV.C. The alternative standard would be based on organic HAP emission testing and concurrent THC CEMS measurements that would establish a site specific THC limit that would demonstrate compliance with the total organic HAP limit. The site specific THC limit would be measured as a 30 day rolling average.

PM. For cement kilns or cement kilns/ in-line raw mills an emissions limit of 0.085 pounds per ton (lb/ton) clinker for existing sources and 0.080 lb/tons clinker for new sources. Kilns and kiln/ in-line raw mills where the clinker cooler gas is combined with the kiln exhaust and sent to a single control device for energy efficiency purposes (i.e., to extract heat from the clinker cooler exhaust) would be allowed to adjust the PM standard to an equivalent level accounting for the increased gas flow due to combining of kiln and clinker cooler exhaust.

Opacity. We are proposing to remove all opacity standards for kilns and clinker coolers because these sources will be required to monitor compliance with the PM emissions limits by more accurate means.

Hydrochloric Acid. For cement kilns or cement kilns/in-line raw mills an emissions limit of 2 ppmv for existing sources and 0.1 ppmv for new sources, measured dry and corrected to 7 percent oxygen. For facilities that are required to use a continuous emissions monitoring

system (CEMS), compliance would be based on a 30 day rolling average.

Clinker Coolers

For clinker coolers a PM emissions limit of 0.085 lb/ton clinker for existing sources and 0.080 lb/tons clinker for new sources.

Raw Material Dryers

THC. For raw materials dryers an emissions limit of 7 ppmv for existing sources and 6 ppmv for new sources, measured dry as propane and corrected to 7 percent oxygen, measured on a 30 day rolling average. Because the proposed existing source standard would be more stringent than the new source standard of 50 ppmv contained in the 1999 final rule for Greenfield new sources, we are also proposing to remove the 50 ppmv standard.

As an alternative to the THC standard, the raw material dryer can meet a standard of 2 ppmv total combined organic HAP for existing sources or 1 ppmv total organic HAP combined for new sources, measured dry and corrected to 7 percent oxygen. The alternative standard would be based on organic HAP emission testing and concurrent THC CEMS measurements that would establish a site specific THC limit that would demonstrate compliance with the total organic HAP limit. The site specific THC limit would be measured as a 30 day rolling average.

B. Operating Limits

EPA is proposing to eliminate the restriction on the use of fly ash where the mercury content of the fly ash has been increased through the use of activated carbon. Given the proposed emission limitation for mercury, whereby kilns or cement kilns/in-line raw mills must continuously meet the mercury emission limits described above (including when using these materials) there does not appear to be a need for such a provision. For the same reason, EPA is proposing to remove the requirement to maintain the amount of cement kiln dust wasted during testing of a control device, and the provision requiring that kilns remove from the kiln system sufficient amounts of dust so as not to impair product quality.

C. Testing and Monitoring Requirements

We are proposing the following changes in testing and monitoring requirements:

Kilns and kiln/in-line raw mills would be required to meet the following changed monitoring/testing requirements:

• CEMS (PS–12A) or sorbent trap monitors (PS–12B) to continuously measure mercury emissions, along with Procedure 5 for ongoing quality assurance.

• CEMS meeting the requirement of PS–8A to measure THC emissions for existing sources (new sources are already required to monitor THC with a CEM). Kilns and kiln/in-line raw mills meeting the organic HAP alternative to the THC limit would still be required to continuously monitor THC (based on the results of THC monitoring done concurrently with the Method 320 test), and would also be required to test emissions using EPA Method 320 or ASTM D6348–03 every five years to identify the organic HAP component of their THC emissions.

• Installation and operation of a bag leak detection system to demonstrate compliance with the PM emissions limit. If electrostatic precipitators (ESP) are used for PM control an ESP predictive model to monitor the performance of ESP controlling PM emissions from kilns would be required. As an alternative EPA is proposing that sources may use a PM CEMS that meets the requirements of PS–11. Though we are proposing the PM CEMS as an alternative compliance method, we are taking comment on requiring PM CEMS to demonstrate compliance.

• CEMS meeting the requirements of PS–15 would be required to demonstrate compliance with the HCl standard. If a facility is using a caustic scrubber to meet the standard, EPA Test Method 321 and ongoing continuous parameter monitoring of the scrubber may be used in lieu of a CEMS to demonstrate compliance. The M321 test must be repeated every 5 years.

For clinker coolers, EPA is proposing use of a bag leak detection system to demonstrate compliance with the proposed PM emissions limit. If an ESP is used for PM control on clinker coolers, an ESP predictive model to monitor the performance of ESP controlling PM emissions from kilns would be required. As an alternative, EPA is proposing that a PM CEMS that meets the requirements of PS–11 may be used.

Raw material dryers that are existing sources would be required to install and operate CEMS meeting the requirement of PS–8A to measure THC emissions. (New sources are already required to monitor THC with a CEM). Raw material dryers meeting the organic HAP alternative to the THC limit would still be required to continuously monitor THC (based on the results of THC monitoring done concurrently with the Method 320 test), and would also be required to test emissions using EPA Method 320 or ASTM D6348–03 every five years to identify the organic HAP component of their THC emissions.

New or reconstructed raw material dryers and raw or finish mills would be subject to longer Method 22 and, potentially, to longer Method 9 tests. The increase in test length duration is necessary to better reflect the operating characteristics of sources subject to the proposed rule.

IV. Rationale for Proposed Amendments to Subpart LLL

A. MACT Floor Determination Procedure for all Pollutants

The MACT floor limits for each of the HAP and HAP surrogates (mercury, total hydrocarbons, HCl, and particulate matter) are calculated based on the performance of the lowest emitting (best performing) sources in each of the MACT pool sources. We ranked all of the sources for which we had data based on their emissions and identified the lowest emitting 12 percent of the sources for which we had data, which ranged from two kilns for THC to 11 kilns for mercury for existing sources. For new source MACT, the floor was based on the best performing source. The MACT floor limit is calculated from a formula that is a modified prediction limit, designed to estimate a MACT floor level that is achievable by the average of the best performing sources (*i.e.*, those in the MACT pool) if the best performing sources were able to replicate the compliance tests in our data base. Specifically, the MACT floor limit is an upper prediction limit (UPL) calculated from: [10]

$$UPL = x_p + t * (V_T)^{0.5}$$

Where:
X_p = average of the best performing MACT pool sources,
t = Student's t-factor evaluated at 99 percent confidence, and
v_T = total variance determined as the sum of the within-source variance and the between-source variance.

The between-source variance is the variance of the average of the best performing source averages. The within-source variance is the variance of the MACT source average considering "m" number of future individual test runs used to make up the average to determine compliance. The value of "m" is used to reduce the variability to account for the lower variability when averaging of individual runs is used to determine compliance in the future. For example, if 30-day averages are used to

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[10] More details on the calculation of the MACT floor limits are given in the memorandum Development of The MACT Floors For The Proposed NESHAP for Portland Cement. April 15, 2009.

determine compliance (m=30), the variability based 30-day average is much lower than the variability of the daily measurements in the data base, which results in a lower UPL for the 30-day average.

B. Determination of MACT for Mercury Emissions From Major and Area Sources

The limits for existing and new sources we are proposing here apply to both area and major new sources. These limits would also apply to area sources consistent with section 112(c)(6) of the Act, as EPA determined in the original rule. See 63 FR at 14193.

1. Floor Determination

Selection of Existing Source Floor

Cement kilns' emissions of mercury reflect exclusively the amounts of mercury in each kiln's feedstock and fuel inputs. The amounts of mercury in these inputs and their relative contributions to overall mercury kiln emissions vary by site. In many cases the majority of the mercury emissions result from the mercury present as a trace contaminant in the limestone, which typically comes from a proprietary quarry located adjacent to the plant. Limestone is the single largest input, by mass, to a cement kiln's total mass input, typically making up 80 percent of that loading. Mercury is also found as a trace contaminant in the other inputs to the kiln such as the additives that supply the required silica, alumina, and iron. Mercury is also present in the coal and petroleum coke typically used to fuel cement kilns.

Based on our current information, mercury levels in limestone can vary significantly, both within a single quarry and between quarries. Since quarries are generally proprietary, this variability is inherent and site-specific. Mercury levels in additives and fuels likewise vary significantly, although mercury emissions attributable to limestone often dominate the total due to the larger amount of mass input contributed by limestone (see further discussion of this issue at Other Options EPA considered in Setting Floor for Mercury below).

The first step in establishing a MACT standard is to determine the MACT floor. A necessary step in doing so is determining the amount of HAP emitted. In the case of mercury emitted by cement kilns, this is not necessarily a straightforward undertaking. Single stack measurements represent a snapshot in time of a source's emissions, always raising questions of how representative such emissions are

of the source's emissions over time. This problem is compounded in the case of cement kilns, because cement kilns do not emit mercury uniformly. Our current data suggest that, for all kilns, the mercury content of the feed and fuels varies significantly from day-to-day. Because most cement kilns have no mercury emissions control, the variations in mercury inputs directly translate to a variability of mercury stack emissions. For modern preheater and preheater/precalciner kilns this problem is compounded because these kilns have in-line raw mills. With in-line raw mills, mercury is captured in the ground raw meal in the in-line raw mill and this raw meal (containing mercury) is returned as feed to the kiln. Mercury emissions may remain low during such recycling operations. However, as part of normal kiln operation raw mills must be periodically shut down for maintenance, and mercury-containing exhaust gases from the kiln are then bypassed directly to the main air pollution control device resulting in significantly increased mercury emissions at the stack. The result is that at any given time, mercury emissions from such cement kilns are either low or high, but rarely in equilibrium, so that single stack tests are likely to either underestimate or overestimate cement kilns' performance over time. Put another way, we believe that single short term stack test data (typically a few hours) are probably not indicative of long term emissions performance, and so are not the best indicator of performance over time. With these facts in mind, we carefully considered alternatives other than use of single short-term stack test results to quantify kilns' performance for mercury.

An alternative to short term stack test data would be to use mercury continuous monitoring data over a longer time period. Because no cement kilns in the United States have continuous mercury monitors, this option was not available. However, mercury is an element. Therefore, all the mercury that enters a kiln has to leave the kiln in some fashion. The available data indicate that almost no mercury leaves the kiln as part of the clinker (product). Therefore, our methodology assumes over the long term that all the mercury leaves the kiln as a stack emission with three exceptions:

1. If instead of returning all particulate captured in the particulate control device to the kiln, the source instead removes some of it from the circuit entirely, *i.e.*, the kiln does not reuse all (wastes some) cement kiln dust (CKD); or

2. The kiln is equipped with an alkali bypass, which means all CKD captured in the alkali bypass PM control is wasted, and/or;

3. If the kiln has a wet scrubber (usually for SO_2 control), the scrubber will remove some mercury which our methodology assumes will end up in the gypsum generated by the scrubber.

Based on these facts we decided that the most accurate method available to us to determine long term mercury emissions performance was to do a total mass balance. We did so by obtaining data on all the kiln mercury inputs (*i.e.*, all raw materials and all fuels) for a large group of kilns, and assuming all mercury that enters the kiln is emitted except for the three conditions noted above. Pursuant to letters mandating data gathering, issued under the authority of section 114, we obtained 30 days of daily data on kiln mercury concentrations in each individual raw material, fuel, and CKD for 89 kilns (which represent 59 percent of total kilns), along with annual mass inputs and the amount of material collected in the PM control device (or alkali PM control device) that is wasted rather than returned to the kiln.

These data were submitted to EPA as daily concentrations for the inputs, *i.e.*, samples of all inputs were taken daily and analyzed daily for their mercury content. We took the daily averages, calculated a mean concentration, and multiplied the mean concentration by annual materials use to calculate an annual mercury emission for each of the 89 kilns. If the facility wasted CKD, we subtracted out the annual mercury that left the system in the CKD. If the facility had a wet scrubber (the only control device currently in use among the sampled kilns with any substantial mercury capture efficiency), we subtracted out the annual mercury attributable to use of the scrubber. There are five cement kilns using wet scrubbers and EPA has removal efficiencies for four of these kilns (based on inlet/outlet testing conducted at EPA's request concurrent with the input sampling). We attributed a removal efficiency for the fifth kiln based on the average removal efficiency of the other four kilns.

We acknowledge that an additional source of uncertainty in the mass balance methodology for estimating the capture efficiencies of wet scrubbers is the variability in the mercury speciation ratios (elemental to divalent). These ratios, which are dependent on the amount of chlorine present and other factors, would be expected to vary at different kilns. Only the soluble divalent mercury fraction will be

captured by a wet scrubber. We note, however, that mercury speciation would be expected to have little effect on mercury emissions in the case where wet scrubbers, or other add-on controls such as activated carbon injection (ACI), are not used, because for most facilities, mercury captured in the PM controls is returned to the kiln. In cases where some of the collected PM is wasted, we had 30 days of actual mercury content data for wasted material.

For each kiln, we calculated an average annual emission factor, which is the average projected emission rate for each kiln. We did this by dividing calculated annual emissions by total inputs. We then ranked each kiln from lowest average emission factor to highest. The resulting emissions factors for 87 of the 89 ranged (relatively continuously) from 7 to 300 pounds of mercury per million tons of feed. Two kilns showed considerably higher numbers, approximately 1200 and 2000 pounds per ton of feed. These two facilities have atypically high mercury contents in the limestone in their proprietary quarries which are the most significant contributors to the high mercury emissions.

Based on these data and ranking methodology, the existing source MACT floor would be the average of the lowest emitting 12 percent of the kilns for which we have data, which would be the 11 kilns with lowest emissions (as calculated), shown in Table 1.

TABLE 1—MERCURY MACT FLOOR

Kiln code	Mercury emissions (lb/MM ton feed)
1233	7.14
1650	10.83
1589	11.11
1302	14.51
1259	15.16
1315	15.41
1248	18.09
1286	21.12
1435	22.89
1484	22.89
1364	23.92
MACT—Existing kilns	
Average: lb/MM tons feed (lb/MM tons clinker)	16.6 (27.4)
Variability ($t*v_T{}^{0.5}$)	9.52

TABLE 1—MERCURY MACT FLOOR—Continued

Kiln code	Mercury emissions (lb/MM ton feed)
99th percentile: lb/MM tons feed (lb/MM tons clinker)	26 (43)
MACT—New kilns	
Average: lb/MM tons feed (lb/MM tons clinker)	7.1 (11.8)
Variability ($t*v_T{}^{0.5}$)	1.3
99th percentile: lb/MM tons feed (lb/MM tons clinker)	8.4 (14)

The average emission rate for these kilns is 16.6 pounds per million tons (lb/MM) tons feed (27.4 lb/MM tons clinker). The emission rate of the single lowest emitting source is 7.1 lb/MM tons feed (11.8 lb/MM tons clinker).

As previously discussed above, we account for variability in setting floors, not only because variability is an element of performance, but because it is reasonable to assess best performance over time. Here, for example, we know that the 11 lowest emitting kiln emission estimates are averages, and that the actual emissions will vary over time. If we do not account for this variability, we would expect that even the kilns that perform better than the floor on average would potentially exceed the floor emission levels a significant part of the time—meaning that their performance was assessed incorrectly in the first instance.

For the 11 lowest emitting kilns, we calculated a daily emission rate using the daily concentration values and annual materials inputs divided by each kiln's operating days.[11] The results are shown in Table 1 and represent the average performance of each kiln over the 30-day period. We then calculated the average performance of the 11 lowest emitting kilns (17 lb/MM tons of feed) and the variances of the daily emission rates for each kiln which is a direct measure of the variability of the

[11] In the daily calculations, we treated the CKD removal as if it was a control device, and applied the overall percent reduction rather that using the daily CKD concentration value. We used this approach because if we used daily CKD removal values, some days showed negative mercury emissions rates. This is because of the mercury recycling issues discussed above.

data set. This variability includes the day-to-day variability in the total mercury input to each kiln and variability of the sampling and analysis methods over the 30-day period, and it includes the variability resulting from site-to-site differences for the 11 lowest emitters. We calculated the MACT floor (26 lb/MM tons feed) based on the UPL (upper 99th percentile) as described earlier from the average performance of the 11 lowest emitting kilns, Students t-factor, and the total variability, which was adjusted to account for the lower variability when using 30 day averages.

EPA also has some information which tends to corroborate the variability factor used to calculate the floor for mercury. These data are not emissions data; they are data on the total mercury content of feed materials over periods of 12 months or longer. Because mercury emissions correlate with mercury content of feed materials, we believe an analysis of the variability of the feed materials is an accurate surrogate for the variability of mercury emissions over time. These long term data are from multiple kilns from a single company that are not ranked among the lowest emitters, but are nonetheless germane as a crosscheck on variability of mercury content of feed materials (including whether 30 days of sampling, coupled with statistically derived variability of that data set and a 99th percentile, adequately measures that variability).

One way of comparing the variability among different data sets with different average values is to calculate and compare the relative standard deviations (RSD), which is the standard deviation divided by the mean, of each set. If the RSD are comparable, then one can conclude that the variability among the data sets is comparable. The results of such an analysis are given in Table 2 below. The long term data represent long term averages of feed material mercury content based on 12 months of data or more, whereas the MACT data sets are for 30 consecutive days of data. The RSD of the long term data range from 0.29 to 1.05, and the RSD of the MACT floor kilns range from 0.10 to 0.89. This comparison suggests that our method of calculating variability in the proposed floor based on variances/99th percentile UPL appears to adequately encompass sources' long-term variability.

TABLE 2—COMPARISON OF LONG-TERM KILN FEED MERCURY CONCENTRATION AT ESSROC PLANTS WITH THE FEED MERCURY CONCENTRATION DATA FOR THE MACT FLOOR KILNS

Kiln	PPM Hg in feed		RSD	Source
	Mean	Standard deviation		
1248 [a]	0.021	0.002	0.10	MACT floor kiln.[b]
1589 [a]	0.021	0.002	0.10	MACT floor kiln.
1435	0.012	0.002	0.16	MACT floor kiln.
1484	0.012	0.002	0.16	MACT floor kiln.
1233	0.011	0.002	0.16	MACT floor kiln.
1650	0.025	0.005	0.22	MACT floor kiln.
Speed	0.055	0.016	0.29	Essroc.[c]
1286	0.006	0.002	0.32	MACT floor kiln.
1364	0.006	0.002	0.32	MACT floor kiln.
San Juan	0.322	0.108	0.34	Essroc.
Bessemer	0.021	0.007	0.35	Essroc.
Logansport	0.022	0.008	0.37	Essroc.
Naz III	0.016	0.010	0.61	Essroc.
Naz I	2.974	1.838	0.62	Essroc.
1302	0.006	0.004	0.68	MACT floor kiln.
1315	0.006	0.004	0.68	MACT floor kiln.
Martinsburg	0.023	0.017	0.89	Essroc.
1259	0.008	0.007	0.89	MACT floor kiln.
Picton	0.075	0.078	1.05	Essroc.

[a] Same feed sample applied to multiple kilns at the plant.
[b] MACT floor kilns' variabilities are all based on approximately 30 days of data.
[c] Essroc kiln's variabilities are all based on 12 months to three years of data.

We are proposing to express the floor as a 30-day rolling average for the following two reasons. First, as explained earlier, daily variations in mercury emissions at the stack for all kilns with in-line raw mills is greater than daily variability of mercury levels in inputs. This is because mercury is emitted in high concentrations during mill-off conditions, but in lower concentrations when mercury is recycled to the kiln via the raw mill ('mill-on'). We believe that 30 days is the minimum averaging time that allows for this mill-on/mill-off variation.

Second, a 30-day rolling average is tied to our proposed implementation regime, which in turn is based on the means by which the data used to generate the standard were developed. As explained above, the proposed floor reflects 30 days of sampling which are averaged, corresponding to the proposed 30-day averaging period. EPA is also proposing to monitor compliance by means of daily monitoring via a CEMS, so that the proposed implementation regime likewise mirrors the means by which the underlying data were gathered and used in developing the standard.

Critical to this variability calculation is the assumption that EPA is adequately accounting for variable mercury content in kiln inputs.[12] As

noted, we did so based on 30 days of continuous sampling of all kiln inputs, plus use of a further statistical variability factor (based on that data set) and use of the 99th percentile UPL. The 30-day averaging time in the standard is a further means of accounting for variability, and accords with the data and methodology EPA used to develop the floor level.

We solicit comment on the accuracy and appropriateness of this analysis. The most pertinent information would of course be additional data of raw material and fuel mercury contents and usage to specific kilns (especially data from sampling over a longer period than 30 days).[13] EPA also expressly solicits further information regarding potential substitutability of non-limestone kiln inputs and whether kilns actually utilize inputs other than those reflected in the 30-day sampling effort comprising EPA's present data base for mercury, and if so, what mercury levels are in these inputs.

Selection of New Source Floor

Based on Table 1, the average associated with the single lowest emitting kiln is 7 lb/MM tons feed (12 lb/MM tons clinker). Applying the UPL formula discussed earlier based on the daily emissions for the best performing kiln, we calculated its 99th percentile UPL of performance, which results in a new source MACT level of 8.4 lb/MM tons feed (14 lb/MM tons clinker).

Because this new source floor is expressed on a different basis than the standard EPA promulgated in December 2006, which was a 41 µg/dscm not to be exceeded standard, it is difficult to directly compare the new source floor proposed in this action to the December 2006 standard. The December 2006 new source mercury emissions limit was based on the performance of wet scrubber-equipped cement kilns. In our current analysis these wet scrubber-equipped kilns were among the lowest emitting kilns, but not the lowest emitting kiln used to establish this proposed new source limit. Based on this fact, we believe this proposed new source floor (and standard, since EPA is not proposing a beyond-the-floor standard) is approximately 30 percent lower than the December 2006 standard.

Other Options EPA Considered in Setting Floors for Mercury

EPA may create subcategories which distinguish among ''classes, types, and sizes of sources''. Section 112(d)(1). EPA has carefully considered that possibility

in considering potential standards for mercury emitted by portland cement kilns. Were EPA to do so, each subcategory would have its own floor and standard, reflecting performance of the sources within that subcategory. EPA may create a subcategory applicable to a single HAP, rather than to all HAP emitted by the source category, if the facts warrant (so that, for example, a subcategory for kilns emitting mercury, but a single category for kilns emitting HCl, is legally permissible with a proper factual basis). Normally, any basis for subcategorizing must be related to an effect on emissions, rather than to some difference among sources which does not affect emissions performance.

The subcategorization possibilities for mercury which we considered are the type of kiln, presence of an inline raw mill, practice of wasting cement kiln dust, mercury concentration of limestone in the kiln's proprietary quarry, or geographic location. Mercury emissions are not affected by kiln type (*i.e.,* wet or dry, pre-calcining or not) because none of these distinctions have a bearing on the amount of mercury inputted to the kiln or emitted by it. In contrast, the presence of an in-line raw mill affects mercury emissions in the short term because the in-line raw mill tends to collect mercury in the exhaust gas and transfer it to the kiln feed. However, since (as discussed above) the raw mill must be shut down periodically for maintenance while the kiln continues to operate, all or most of the collected mercury simply gets emitted during the raw mill shutdown and total mercury emissions over time are not changed.

The practice of wasting cement kiln dust does affect emissions. This practice means that a portion of the material collected on the PM control device is removed from the kiln system, rather than recycled to the kiln. Some of the mercury condenses on the PM collected on the PM control device, so wasting CKD also removes some mercury from the kiln system (and therefore it is not emitted). However, since this practice could be considered to ''control'' mercury, subcategorization by CKD wasting would be the same as subcategorizing by control device, which is not permissible. *See* 69 FR at 403 (Jan. 5, 2004).

There is no variation in kiln location (*i.e.,* geographical distinction) which would justify subcategorization. We examined the geographical distribution of mercury emissions and total mercury and found no correlation. For example, no one region of the country has kilns that tend to be all low- or high-emitting kilns.

We also rejected subcategorization by total mercury inputs. Subcategorization by this method would inevitability result in a situation where kilns with higher total mercury inputs would have higher emission limits. Total mercury inputs are correlated with mercury emissions. So a facility that currently has lower mercury inputs could potentially simply substitute a higher mercury raw material without any requirement to control the additional mercury. In addition, fuels and other additives are non-captive [14] situations,

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[14] 'Non-captive' means these materials do not necessarily come from the facility's proprietary quarry and the facility has choices for the source of these materials.

and thus do not readily differentiate kilns by ''size, class, or type''. Finally, because of the direct correlation of mercury emissions and mercury inputs, subcategorization by total mercury inputs could potentially be viewed as a similar situation to subcategorization by control device.

The subcategorization option that we believe is most pertinent would be to subcategorize by the facility's proprietary limestone quarry. All cement plans have a limestone quarry located adjacent to or very close to the cement plant. This quarry supplies limestone only to its associated plant, and is not accessible to other plants. Typically quarries are developed to provide 50 to 100 years of limestone, and the cement kiln is located based on the location of the quarry. See 70 FR at 72333. For this reason, we believe that a facility's proprietary quarry is an inherent part of the process such that the kiln and the quarry together can be viewed as the affected source. Also, the amount of mercury in the proprietary quarry can significantly affect mercury emission because (as noted above) limestone makes up about 80 percent of the total inputs to the kiln. Thus, kilns with mercury above a given level might be considered a different type or class of kiln because their process necessarily requires the use of that higher-mercury input.

The facts, however, do not obviously indicate sharp disparities in limestone mercury content that readily differentiate among types of sources. Figure 1 presents the average mercury contents of the proprietary quarries on the 89 kilns in EPA's present data base.

Average Mercury Content of Limestone
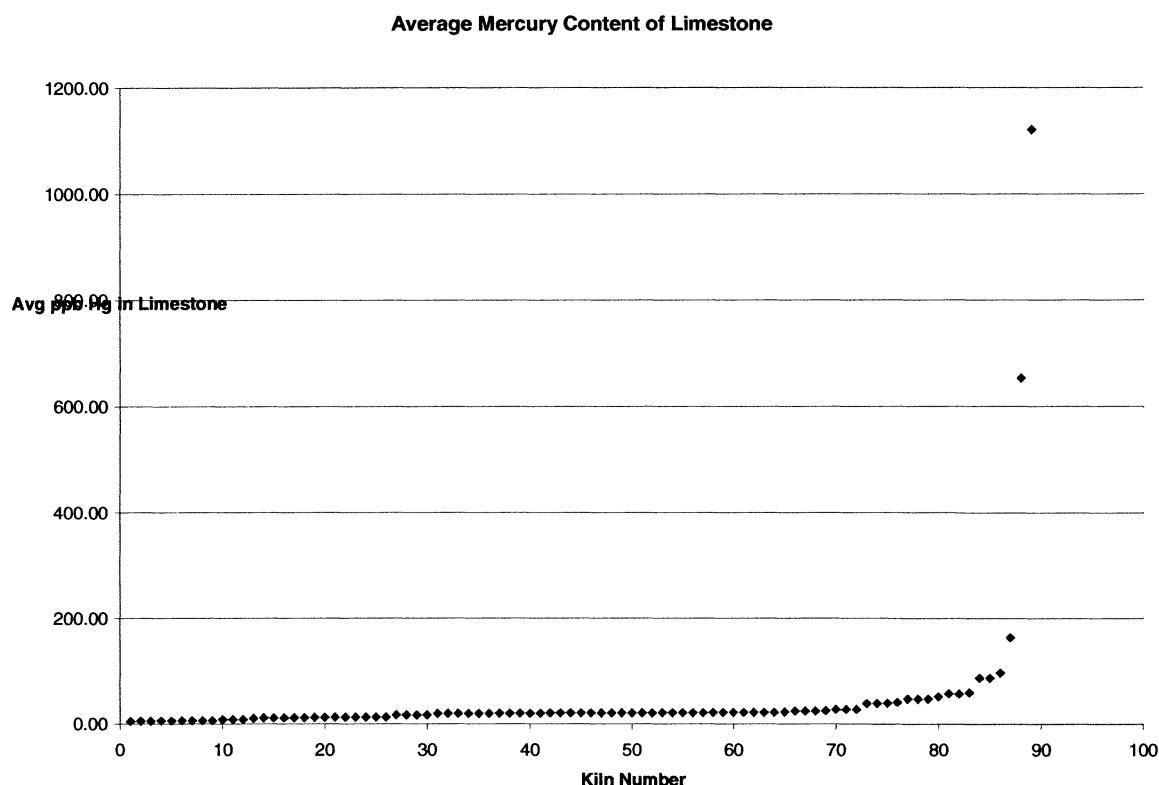
Figure 1. Average Mercury Concentration of Limestone

These data, as we presently evaluate them, do not readily support a subcategorization approach—putting aside for the moment the high mercury limestone kilns (at the far right of the distribution tail in Figure 1) which are discussed separately. As shown in Figure 1, mercury levels in limestone are more of a continuum with no immediately evident breakpoints (again, putting aside the high-mercury limestone kilns). More important, kilns with quarries with varied mercury content can and do have similar mercury emissions, and in many instances, limestone mercury is not the dominant source of mercury in the kilns' emissions notwithstanding that limestone is the principal volumetric input. Thus for about 55 percent of the kilns (49 of 89), non-limestone mercury accounted for greater than 50 percent of the kiln's mercury emissions.[15] For nearly 70 percent of the kilns (62 of 89), limestone mercury accounted for at least one-third of total mercury emissions.

TABLE 3—ORIGINS OF MERCURY IN PORTLAND CEMENT MANUFACTURING

[Sorted by limestone percent] [a]

Random number kiln code	Limestone mercury con- centration (ppb)	Percent Hg from lime- stone [a]	Percent Hg from other raw materials	Percent Hg from fuels
1629	652.92	92	8	0
1647	40.88	89	5	7
1581	96.73	88	9	3
1376	27.43	87	5	8
1609	1120.75	87	13	0
1688	27.43	87	5	8
1690	27.43	87	5	8
1339	21.00	84	8	9
1324	21.30	83	1	16
1693	21.72	80	7	13
1692	20.23	79	13	8
1419	20.92	77	16	8
1248	20.92	76	17	6
1302	6.24	76	7	17
1686	51.21	76	19	6
1239	59.40	74	17	8

[15] In certain instances, percentages of non-limestone mercury are high because limestone mercury content was low. However, in many instances, non-limestone mercury contributions exceeded those from limestone even where limestone mercury contribution was relatively high. See Table 3.

TABLE 3—ORIGINS OF MERCURY IN PORTLAND CEMENT MANUFACTURING—Continued

[Sorted by limestone percent] [a]

Random number kiln code	Limestone mercury con-centration (ppb)	Percent Hg from lime-stone [a]	Percent Hg from other raw materials	Percent Hg from fuels
1315	6.24	74	7	19
1265	12.18	73	16	11
1251	20.92	70	16	13
1592	46.99	68	11	21
1650	24.92	68	3	28
1643	22.02	67	1	33
1674	22.02	67	1	32
1225	46.99	66	11	23
1268	16.97	65	4	31
1226	21.45	64	11	26
1589	20.92	64	30	5
1200	86.65	63	5	32
1218	86.65	63	5	32
1415	20.00	63	29	7
1439	46.99	63	11	27
1421	13.00	62	27	11
1435	11.56	62	25	13
1463	12.18	62	13	25
1484	11.56	62	25	13
1481	39.12	60	35	5
1337	57.17	59	17	24
1375	20.67	59	21	20
1448	57.17	59	17	24
1615	20.67	58	21	21
1259	8.31	57	23	20
1327	20.67	57	21	23
1604	20.00	55	22	23
1256	21.63	54	41	5
1294	21.63	54	41	5
1343	21.63	54	41	5
1350	21.63	54	41	5
1220	21.54	53	40	6
1635	21.23	52	41	7
1638	39.00	48	3	48
1233	11.31	46	41	14
1240	21.23	44	3	53
1331	16.93	44	12	44
1417	39.00	44	3	53
1594	16.93	42	12	46
1371	20.10	40	16	44
1619	20.10	40	16	43
1660	16.93	39	11	50
1443	20.00	38	57	5
1396	20.43	35	61	4
1436	20.10	35	15	50
1286	5.67	33	2	65
1364	5.67	32	2	66
1582	24.59	30	13	57
1591	24.59	30	13	57
1655	24.59	30	13	57
1253	12.94	29	60	11
1323	12.94	29	60	11
1390	12.94	29	60	11
1639	12.94	29	60	11
1663	12.94	29	60	11
1308	6.15	27	1	72
1520	19.86	27	34	38
1521	6.15	27	1	72
1536	10.65	27	0	73
1246	20.00	26	65	9
1316	20.00	26	65	9
1559	5.00	26	19	55
1335	20.30	25	55	21
1437	21.20	25	50	25
1597	21.20	25	49	26
1219	11.25	20	71	8
1560	11.09	18	76	5
1494	5.22	17	54	28

TABLE 3—ORIGINS OF MERCURY IN PORTLAND CEMENT MANUFACTURING—Continued

[Sorted by limestone percent] [a]

Random number kiln code	Limestone mercury concentration (ppb)	Percent Hg from limestone [a]	Percent Hg from other raw materials	Percent Hg from fuels
1610	163.39	17	10	73
1530	5.22	15	53	32
1630	22.60	15	84	2
1538	8.42	10	89	1
1356	8.23	8	91	1

[a] The combined percentages of limestone, other raw materials, and fuels add to 100 percent.

These data seem to indicate that although quarry mercury content is important, other non-proprietary inputs can and do affect mercury emissions as well, often to an equal or greater extent. Quarries with similar limestone mercury content can and do have very different mercury emissions. These facts, plus the general continuum in the limestone mercury data, seem to mitigate against subcategorizing on this basis for the great bulk of industry sources.

Moreover, as stated above, subcategorization is limited by the CAA to size, class, or type of source. Both EPA and advance industry commenters [16] applied various statistical analyses to the mercury limestone quarry data set and these analyses indicated that there could be populations of quarries that were statistically different. However, it is unclear to us that a statistical difference in a population is necessarily the same as a distinction by size, class, or type. More compelling facts, at least in our present thinking, are the apparent continuum of limestone mercury levels, and the fact that limestone mercury levels are less of a driver of mercury emission levels than one would expect if this is to be the basis for subcategorization across a broad set of the facilities. EPA is also concerned that subcategorization by quarry mercury content may allow some higher-emitting facilities to do relatively less for compliance were they to be part of a separate subcategory where mercury levels of best performers were comparatively high. (Of course, these levels could be reduced by adopting standards reflecting beyond-the-floor determinations.) Conversely, the case could occur where a lower emitter might be subject to a greater degree of control than a high emitter. For example, if we were to establish a subcategory at 20 ppb mercury in the

limestone, kilns at just below the 20 ppb level might be required to apply mercury controls while kilns just above the 20 ppb level, which would likely include kilns that would determine the floor level of control, would have to do nothing to meet the mercury standard.

Much of this analysis, however, does not apply to the kilns at the far end of the distribution, especially the two facilities shown in Figure 1 which have the highest quarry mercury contents which quarries appear to be outliers from the general population. These sources' mercury emissions are related almost entirely to the limestone mercury content, not to other inputs.

However, EPA is not proposing to create a separate subcategory for these high mercury sources. We note that if we set up a separate subcategory for these facilities, even if we proposed a beyond-the-floor standard based on the best estimated performance of control for these two facilities, their emissions limit would potentially be 500 to 800 lb/ MM tons clinker, which is well above any other kiln, even when uncontrolled, in our data base, and 8 to 13 times the floor established for other existing sources (assuming no further subcategorization). Mercury in the air eventually settles into water or onto land where it can be washed into water. Once deposited, certain microorganisms can change it into methylmercury, a highly toxic form that builds up in fish, shellfish and animals that eat fish. Fish and shellfish are the main sources of methylmercury exposure to humans. (*See* section IV.4 for further discussion of mercury health effects.) Mercury is one of the pollutants identified for special control under the Act's air toxics provision (see section 112c(6)), and kilns in a high-mercury subcategory, no matter how well controlled, would still be allowed to emit large amounts (at least pending a section 112(f) residual risk determination)).

EPA is also mindful of the holding of *Brick MACT* and other decisions that EPA must account for raw material HAP

contributions in establishing MACT floors, and the fact that raw materials may be proprietary or otherwise not obtainable category-wide does not relieve EPA of that obligation. See, *e.g.* 479 F. 3d at 882–83.

There are also competing considerations here. The concurring opinion in *Brick MACT* supports subcategorization in situations involving sources' dependence on high-HAP raw materials to avoid situations where a level of performance achieved by some sources proves unachievable by other sources even after application of best technological controls, viewing such sources as of a different type than others in the source category. 479 F. 3d at 884–85. A further consideration is that one of the high mercury kilns here has voluntarily entered into an enforceable agreement to install activated carbon (the best control technology currently available so far as is known) to control its mercury emissions and this agreement appears to have the support of directly affected stakeholders (local citizen groups, regional and state officials).[17] The company is poised to begin installation of the control technology. However, neither EPA nor the company believe that this source could physically achieve the level of the mercury floor derived from a single source category approach (*i.e.,* the no subcategorization approach proposed above) using activated carbon alone. We do not currently have any data on the possibility that this site may have portions of its existing quarry that have lower mercury content, or if the site could apply different mercury controls in addition to ACI to meet the proposed limit. Closure of this kiln and possibly other high mercury emitting kilns is a possible consequence of a single standard without subcategories.

EPA repeats that it is not proposing for mercury any subcategories for

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[16] *See* Minutes of March 19, 2006 meeting between representative of the Portland Cement Association and E. Craig, USEPA.

[17] Minutes of meeting between EPA and representatives of Ash Grove Cement. February 27, 2009.

mercury for the reasons discussed above. Nonetheless, this remains an issue EPA intends to evaluate carefully based on public comment, and expressly solicits comment addressing all aspects of determinations whether or not to subcategorize. These comments should address not only the issue of a high-mercury subcategory (addressing plants in the upward right-hand tail of the distributional curve in Figure 1), but other sources as well. EPA also solicits comment regarding non-limestone inputs to cement kilns, and whether there is any potential basis for considering a valid subcategorization approach involving such materials.[18]

Other Alternatives Considered for Mercury Standard

EPA is proposing to rank sources by emission level in determining which are best performing. We also considered another option of ranking best performers based on their relative mercury removal efficiency, and presenting a standard so-derived as an alternative to the standard based on ranking by lowest emissions. The MACT floor for new sources is to be based on the performance of the ''best controlled'' similar source, and the term ''control'' can be read to mean control efficiency. It can also be argued that the critical terms of section 112 (d)(3)—''best controlled'' (new)/''best performing'' (existing)—do not specify whether ''best'' is to be measured on grounds of control efficiency or emission level. *See Sierra Club* v. *EPA,* 167 F.3d 658, 661 (''average emissions limitation achieved by the best performing 12 percent of units' * * * on its own says nothing about how the performance of the best units is to be calculated''). Existing source floors determined and expressed in terms of control efficiency are also arguably consistent with the requirement that the floor for existing sources reflect ''average emission limitation achieved'', since ''emission limitation'' includes standards which limit the ''rate'' of emissions on a continuous basis—something which percent reduction standards would do. CAA section 302(k). There are also instances where Congress expressed performance solely in terms of numerical limits, rather than performance efficiency, suggesting that

Congress was aware of the distinction and capable of delineating it. See CAA section 129(a)(4).[19]

There are also arguments that percent reduction standards are not legally permissible. The *Brick MACT* opinion states, arguably in *dicta,* that best performers are those emitting the least HAP (see 479 F. 3d at 880 (''section [112 (d)(3)] requires floors based on emission levels actually achieved by best performers (those with the lowest emission levels)'').[20] More important, the opinion stresses that raw material inputs must be accounted for in determining MACT floors. *Id.* at 882–83. A problem with a percent reduction standard here is that it would downplay the role of HAP inputs on emissions by allowing more HAP to be emitted provided a given level of removal efficiency reflecting the average of best removal efficiencies is achieved. For these reasons, EPA is not proposing an alternative standard for mercury expressed as percent reduction reflecting the average of the best removal efficiencies. EPA solicits comment on this alternative from both a legal and policy standpoint, however.

2. Beyond the Floor Determination

We are not proposing any beyond-the-floor standards for mercury. When we establish a beyond the floor standard we typically identify control techniques that have the ability to achieve an emissions limit more stringent than the MACT floor. Under the proposed amendments, most existing kilns would have to have installed both a wet scrubber and activated carbon injection (ACI) for control of mercury, HCl and THC.[21] To achieve further reductions in mercury beyond what can be achieved using wet scrubber and ACI in combination, the available options would include closing the kiln and relocating to a limestone quarry having lower mercury concentrations in the limestone, transporting low-mercury limestone in from long distances, switching other raw materials to lower the amount of limestone in the feed, wasting CKD, and installing additional add-on control devices. For reasons discussed further below we believe that all but the latter option (add-on controls) are either cost prohibitive or

too site specific to serve as the basis of a national potential beyond the floor standard. For that reason, we estimated the cost and incremental reduction in mercury emissions associated with installing another control device in series to the other controls. The add-on controls considered included a wet scrubber and ACI. Because ACI is less costly and is expected to have a higher removal efficiency as well as being potentially capable of removing elemental mercury (using halogenated carbon) which a scrubber cannot remove, we selected ACI as the beyond-the-floor control option (i.e., the kiln would now have an additional ACI system in series with the wet scrubber/ ACI system required to meet the MACT floors for mercury, THC, and HCl).

We estimated the costs and emission reductions for a 1.2 million tpy kiln as it would be representative of the impacts of other kilns. Annualized costs for an additional ACI system would be $1.254 million per year. The quantity of mercury leaving the upstream controls would be an estimated 3.3 lb/yr. Assuming a 90 percent control efficiency, the additional ACI system would remove about 3.0 lb/yr of mercury for a cost-effectiveness of approximately $420,000 per lb of mercury reduction. A 90 percent removal efficiency may be optimistic given the lower level of mercury entering the device and a removal efficiency on the order of 70 percent is more likely. At this efficiency, the additional mercury controlled would be 2.3 lb/yr for a cost effectiveness of approximately $540,000 per pound of mercury removed. At either control efficiency, we believe cost of between $420,000 and $540,000 per pound of mercury removed is not justified and we are therefore not selecting this beyond-the-floor option.

There are two potential feasible process changes that have the potential to affect mercury emissions. These are removing CKD from the kiln system and substituting raw materials, including fly ash, or fossil fuels with lower-mercury inputs. Although substituting low-mercury materials and fuel may be feasible for some facilities, this alternative would depend on site-specific circumstances and, therefore, must be evaluated on a site-by-site basis and EPA's current view is that it would not be a uniformly applicable (or quantifiable) control measure on which a national standard could be based (although as noted earlier, EPA is expressly soliciting quantified comment regarding potential substitutability of non-limestone kiln inputs). In addition, in the case of substitution of lower

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[18] One of these high-mercury sources suggested that because it is an area source, EPA develop a mercury standard for it based upon Generally Available Control Technology (GACT) rather than MACT. See section 112(d)(5) of the Act. Aside from questions about whether use of activated carbon is a generally available control technology here, EPA has already determined that all cement kilns' mercury emissions are subject to MACT under authority of section 112(c)(6). *See* 63 FR at 14193.

[19] *See* also section 112(i)(5)(A), which allows sources that achieve early reductions based on measured rates of removal efficiency a reprieve from MACT.

[20] The issue of whether best performers can be based on source's removal efficiency was not presented in *Brick MACT,* or any of the other decided cases.

[21] Summary of Environmental and Cost Impacts of Proposed Revisions to Portland Cement NESHAP (40 CFR Part 63, subpart LLL), April 15, 2009.

mercury inputs, we believe that mandating lower mercury materials (such as a ban on fly ash containing mercury as a raw material) would not result in mercury reduction beyond those achieved at the floor level of control.

Based on material balance data (feed and fuel usage, control device catch recycling and wasting, and mercury concentrations) that we gathered with our survey of 89 kilns, 58 percent of kilns waste some amount of CKD while 42 percent waste none. Among kilns that waste CKD, the percentage reduction in mercury emissions by wasting CKD ranged from 0.13 percent to 82 percent, with an average of 16.5 percent and median of 7 percent. For kilns that waste some CKD, CKD as a percentage of total feed ranges from 0.16 percent to 13.7 percent, with a mean of 4.5 percent. Any additional emission reductions that can be achieved by wasting CKD depend on several site-specific factors including:

• The concentration of mercury in raw feed and fuel materials.

• The concentration of mercury in the CKD.

• The amount of CKD already being wasted.

• The dynamics of mercury recirculation and accumulation—Internal loops for mercury exist between the control device and kiln feed storage and the kiln for long dry and wet kilns. For preheater and precalciner kilns, there is usually an additional internal loop involving the in-line raw mill. These internal loops and the distribution of mercury throughout the process are not predictable and can only be determined empirically.

• Mercury speciation may affect the extent to which mercury accumulates in the CKD, with particulate and oxidized mercury more likely to accumulate while elemental mercury is likely emitted and not affected by CKD wasting.

Reducing mercury emissions through the wasting of CKD may be feasible for some kilns that do not already waste CKD or by wasting additional CKD for some kilns that already practice CKD wasting. However the degree to which CKD can be used to reduce mercury emissions cannot be accurately estimated due to several factors. For example, increasing the amount of CKD wasted would result in a reduction in the mercury concentration of the CKD, so that, over time, the effectiveness of wasting CKD decreases. We do not have long-term data to quantify the

relationship between amount of CKD wasted, CKD mercury concentration and emissions.

The ability to reduce mercury emissions by wasting more CKD also is affected by the mercury species present. The particulate and oxidized species of mercury can accumulate in CKD, but not the elemental form. Therefore wasting CKD will not necessarily control elemental mercury. We do not have data that would allow us to quantify the effect of mercury speciation. By wasting CKD, additional raw materials would be required to replace the CKD as well as additional fuel to calcine the additional raw materials, thereby offsetting to some extent the benefits of wasting CKD. There is the further potential consideration of additional waste generation, an adverse cross-media impact EPA is required to consider is making beyond-the-floor determinations. The interaction of these factors is complex and has not been adequately studied.

One cement plant has investigated the potential to reduce mercury emissions by wasting CKD. This facility, using mercury CEMS and material balance information, estimated that wasting 100 percent of CKD when the raw mill is off (about 19,000 tons of CKD or 16 percent of total baghouse catch, or 1 percent of total feed) would reduce mercury emissions by about 4 percent. This facility did not estimate the reductions in mercury emissions by wasting more CKD. As with the potential to reduce mercury emissions using raw materials substitution, the effectiveness of CKD wasting in reducing emissions may provide cement plants the ability to reduce mercury emissions but the degree of reduction will have to be determined on a site-by-site basis.

Because the degree to which mercury emissions can be reduced by material substitutions or through the wasting of CKD are site specific, these process-related work practices were not considered as beyond-the-floor options.

As a result of these analyses, we determined that, considering the technical feasibility and costs, there is no reasonable beyond the floor control option, and are proposing a mercury emission limit based on the MACT floor level of control.

C. Determination of MACT for THC Emissions From Major and Area Sources

The limits for existing and new sources we are proposing here apply to

both area and major new sources. We have applied these limits to area sources consistent with section 112(c)(6). *See* 63 FR 14193 (THC as a surrogate for the 112(c)(6) HAP polycyclic organic matter and polychlorinated biphenyls, plus determination to control all THC emissions from the source category under MACT standards).

1. Floor Determination

Selection of Existing Source Floor

For reasons previously discussed in the initial proposal of the Portland Cement NESHAP (63 FR 14197, March 24, 1998), we are proposing to use THC as a surrogate for non-dioxin organic HAP that are emitted from the kiln (as is the current rule). The THC data used to develop the MACT floor were obtained from 12 kilns using CEMS to continuously measure the concentration of THC exiting each kiln's stack. Only kilns 1 (regenerative thermal oxidizer (RTO)) and kilns 11 and 12 (ACI) have emissions controls which remove or destroy THC. We also obtained THC data from manual stack tests, typically based on 3 one hour runs per test. The CEMS data are superior to the results of a single stack test for characterizing the long term performance and in determining the best performing kilns with respect to THC emissions for several reasons. The manual stack test is of short duration and only represents a snapshot in time; consequently, it provides no information on the variability in emissions over time due to changes in raw material feed or in kiln operating conditions. In contrast, the CEMS data include measurements that range from 31 consecutive days to almost 900 days of operation for the various kilns. This extended duration of the CEMS test data gives us confidence that for any particular kiln CEMS data will capture the variability associated with the long-term THC emissions data, and thus give the most accurate representation of a source's performance. In addition, a MACT standard based on CEMS data would be consistent with the way we are proposing to implement the THC emission limit (*i.e.,* by requiring continuous monitoring with a THC CEMS).

In order to set MACT floors we are ranking the kilns based on the average THC emissions levels (in ppmv) achieved (*i.e.,* each kiln's averaged performance, averaged over the number of available measurements. This ranking is shown in Table 4.

TABLE 4.—SUMMARY OF THC CEMS DATA AND MACT FLOOR

Kiln	Average	Number of readings	Kiln type	In-line raw mill
Kiln 1	4.0	35	Preheater/precalciner	Yes.
Kiln 2	5.6	695	Wet	No.
Kiln 3	6.8	692	Long dry	No.
Kiln 4	6.8	31	Preheater/precalciner	Yes.
Kiln 5	11.1	702	Long dry	No.
Kiln 6	23.7	470	Preheater/precalciner	No.
Kiln 7	45.0	742	Preheater/precalciner	Yes.
Kiln 8	51.6	774	Preheater/precalciner	Yes.
Kiln 9	51.9	843	Preheater/precalciner	Yes.
Kiln 10	62.8	880	Preheater/precalciner	Yes.
Kiln 11 and Kiln 12 Combined	748.1	790	Wet	No.
Existing Source Average (ppmvd at 7% O2, propane).	4.8			
Variability ($t*v_T{}^{0.5}$)	1.9			
Existing Source 99th percentile (ppmvd at 7% O2, propane).	7			
New Source Average (ppmvd at 7% O2, propane).	4.0			
Variability ($t*v_T{}^{0.5}$)	1.5			
New Source 99th percentile (ppmvd at 7% O2, propane).	6			

The average performance of the best performing 12 percent of kilns (2 kilns) is 4.8 ppmvd THC (a daily average expressed as propane at 7 percent oxygen). We calculated variability based on the variances in the performance of the two lowest emitting kilns. This includes day-to-day variability at the same kiln, variability among the two lowest emitting kilns, and because one dataset included 695 daily measurements, it represents long term variability at a single kiln. We calculated the MACT floor (7 ppmvd) based on the UPL (upper 99th percentile) as described earlier from the average performance of the 2 lowest emitting kilns, Student's t-factor, and the total variability, which was adjusted to account for the lower variability when using 30 day averages.

In this case the proposed new and existing source MACT floors are almost identical because the best performing 12 percent of kilns (for which we have emissions information) is only two sources. The reason we look to the best performing 12 percent of sources is that the cement kiln source category consists of 30 or more kilns. Section 112(d)(3)(A) of the Clean Air Act provides that standards for existing sources shall not be less stringent than "the average emission limitation achieved by the best performing 12 percent of the existing sources (for which the Administrator has emissions information), * * * in the category or subcategory for categories and subcategories with 30 or more sources." A plain reading of the above statutory provisions is to apply the 12 percent rule in deriving the

MACT floor for those categories or subcategories with 30 or more sources. The parenthetical "(for which the Administrator has emissions information)" in section 112(d)(3)(A) modifies the best performing 12 percent of existing sources, which is the clause it immediately follows.

However, in cases where there are 30 or more sources but little emission data this results in only a few kilns setting the existing source floor with the result that the new and existing source MACT floors are almost identical. In contrast, if this source category had less than 30 sources, we would be required to use the top five best performing sources, rather than the two that comprise the top 12 percent. Section 112 (d)(3)(B).

We are seeking comment on whether, with the facts of this rulemaking, we should consider reading the intent of Congress to allow us to consider five sources rather than just two. First, it seems evident that Congress was concerned that floor determinations should reflect a minimum quantum of data: At least data from five sources for source categories of less than 30 sources (assuming that data from five sources exist). Second, it does not appear that this concern would be any less for source categories with 30 or more sources. The concern, in fact, would appear to be greater.[22] We note further that if we were to use five sources as best THC performers here, the existing

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[22] As noted, basing the proposed existing source THC floor on data from two sources (*i.e.* 12 percent of the 15 sources for which we have CEM data) largely eliminates the distinction between new and existing source THC floors. Yet this is an important statutory distinction.

source floor would be 10 ppmvd. We are specifically requesting comment on interpretive and factual issues relating to the proposed THC floors, and also reiterate requests for further THC performance data, especially from kilns equipped with CEMs.

Selection of New Source MACT Floor

The new source MACT floor would be the best performing similar source accounting for variability, which would be 6 ppmvd. We used the same procedure in estimating variability for the new source based on the 35 observations reported.

Alternative Organic HAP Standards

EPA is also proposing an alternative floor for non-dioxin organic HAP, based on measuring the organic HAP itself rather than the THC surrogate. This equivalent alternative limit would provide additional flexibility in determining compliance, and it would be appropriate for those rare cases in which methane and ethane comprise a disproportionately high amount of the organic compounds in the feed because these non-HAP compounds could be emitted and would be measured as THC. A previous study that compared total organic HAP to THC found that the organic HAP was 23 percent of the THC. We also analyzed additional data submitted during the development of this proposed rule that included simultaneous measure of organic HAP species and THC. Data were available from tests at five facilities, and the organic HAP averaged 24 percent of the THC. Based on these analyses, we are proposing an equivalent alternative

emission limit for organic HAP species of 2 ppmv (*i.e.,* 24 percent of the 7 ppmv MACT standard for THC) for existing sources and 1 ppmvd for new sources. The specific organic compounds that will be measured to determine compliance with the alternative to the THC limit are benzene, toluene, styrene, xylene (ortho-, meta-, and para-), acetaldehyde, formaldehyde, and naphthalene. These were the organic HAP species that were measured along with THC in the cement kiln emissions tests that were reviewed. Nearly all of these organic HAP species were identified in an earlier analysis of the organic HAP concentrations in THC in which the average concentration of organic HAP in THC was 23 percent.

Other Options Considered

We also examined the THC results to determine if subcategorization by type of kiln was warranted and concluded that the data were insufficient for determining that a distinguishable difference in performance exists based on the type of kiln. The top performing kilns in Table 4 include various types: wet, long dry, and preheater/precalciner kilns; older (wet kilns) and newer (precalciner kilns); and those with and without in-line raw mills. Although the type of kiln and the design and operation of its combustion system may have a minor effect on THC emissions, the composition of the feed and the presence of organic compounds in the feed materials apparently have a much larger effect. For example, organic compounds in the feed materials may volatilize and be emitted before the feed material reaches the high temperature combustion zone of the kiln where they would have otherwise been destroyed.

We also evaluated creating separate subcategories for kilns with in-line raw mills and those without. With an in-line raw mill kiln, exhaust is used to dry the raw materials during the grinding of the raw meal. This drying step can result in some organic material being volatilized, thus increasing the THC emissions in the kiln exhaust. This means that kilns with in-line raw mills would, on average, have higher emissions than kilns without in-line raw mills. The existence, or absence, of a raw mill is believed to have a distinct effect on emissions of THC, as one would expect. It is difficult to generalize that difference because the effect of the raw mill will vary based on the specific organic constituents of the raw materials. In tests at one facility, THC emissions, on average, were 35 percent

higher with the raw mill on than when the raw mill was off.[23]

This physical difference could justify subcategorization based on the presence of an in-line raw mill. There are also potential policy reasons for doing so. By not subcategorizing, use of in-line raw mills may be discouraged because, to meet a THC standard, in-line raw mill-equipped kilns would potentially have to utilize an RTO. Use of RTOs has various significant adverse environmental consequences, including increase in emissions of criteria pollutants, and significant extra energy utilization with attendant increases in carbon dioxide (CO_2) gas emissions.[24]

EPA has performed floor calculations for subcategories of kilns with and without in-line raw mills. The result of that calculation, where we were using the top 12 percent, was that the floor for kilns with in-line raw mills was actually lower than the floor for those without, which is atypical: sources with in-line raw mills will typically have higher emissions because of the extra volatilization. We believe this result is the artifact of the small data set used to calculate the existing source MACT floor. Based on these results, we have concluded that the current data are not sufficient to allow us to subcategorize by the presence of an in-line raw mill, but would consider subcategorizing if additional data become available. We are specifically requesting comment on subcategorization by the presence or absence of an in-line raw mill and requesting data on this issue.

2. Beyond the Floor Determination

Practices and technologies that are available to cement kilns to control emissions of organic HAP include raw materials material substitution, ACI systems and limestone scrubber and RTO. We do not think it is appropriate to develop a beyond-the-floor control option based on material substitution here because substitution options are site specific.

We examined the use of either ACI systems or RTO (with a dedicated wet scrubber)[25] as the basis for potential beyond-the-floor THC standards for existing and new sources. (We did not examine other beyond-the-floor regulatory options for existing or new sources because there are no controls that would, on average, generate a

greater THC reduction than a combination of a wet scrubber/RTO.) These technologies are currently in limited use in the source category. At one facility, activated carbon is injected into the flue gas and collected in the PM control device. The activated carbon achieved a THC emissions reduction of approximately 50 percent, and the collected carbon is then injected into the kiln in a location that insures destruction of the collected THC. The THC emissions from this facility are the highest for any facility for which we have data due to very unusual levels of organic material in the limestone and may not be representative of the performance that can be achieved by kilns with more typical THC emissions.[26]

ACI has been demonstrated in other source categories, such as various types of waste incinerators including municipal waste incinerators, to reduce dioxin/furan by over 95 percent.[27] The actual performance of ACI systems on cement kiln THC emissions are expected to be less than that achieved on dioxin/furan emissions as kiln flue gases are a mixture of volatile and semi-volatile organic compounds, which vary according to the organic constituents of raw materials. We have therefore conservatively estimated that ACI systems can reduce THC emissions by 75 to 80 percent. A second facility has a continuously operated limestone scrubber followed by an RTO. This facility has been emission tested and showed volatile organic compound (VOC), which are essentially the same as THC, emission levels of 4 ppmv (at 7 percent oxygen), and currently has a permit limit for VOC of approximately 9 ppmv. The RTO has a guaranteed destruction efficiency of 98 percent of the combined emissions of carbon monoxide and THC. Based on this information, we believe this facility represents the best possible control performance to reduce THC emissions.

In assessing the potential beyond-the-floor options for THC, we first determined that most existing kilns would have to install an ACI system for control of THC and/or mercury. A few kilns would be expected to install an RTO in order to get the THC proposed reductions. To evaluate the feasibility of

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[23] E-mail and attachments. B. Gunn, National Cement Company of Alabama to K. Barnett. USEPA. March 12, 2009. THC Mill on/Mill Off Variability.

[24] Summary of Environmental and Cost Impacts of Proposed Revisions to Portland Cement NESHAP (40 CFR Part 63, subpart LLL), April 15, 2009.

[25] A wet scrubber is needed as a pretreatment step before gases are amenable to destruction in an RTO.

[26] The same facility that uses ACI has a second control scheme for THC consisting of a wet scrubber/RTO in series. However, due to operational problems, this system has not operated more than a few months at a time and data from it are not representative of the performance of these control devices.

[27] (Chi and Chang, Environmental Science and Technology, vol. 39, issue 20, October 2005; Roeck and Sigg, Environmental Protection, January 1996).

beyond-the-floor controls, we assumed that a kiln already expected to install an ACI system would install in series an RTO including a wet scrubber upstream of the RTO to protect the RTO. We estimated the costs and emission reductions for a 1.2 million tpy kiln as the cost effectiveness of the beyond-the-floor option would be similar for all kilns. Annualized costs for an additional RTO system would be $3.8 million per year. The quantity of THC leaving the upstream controls would be an estimated 18 tpy. At higher THC concentrations, for example 15 ppmv and above, an RTO will have a removal efficiency of about 98 percent. This mass of THC leaving the device upstream of and entering the RTO is equivalent to a THC concentration of about 3 ppmv. At this low level, an RTO's removal efficiency is expected to be no better than 50 percent. At a 50 percent control efficiency, the RTO would reduce THC emission by about 9 tpy for a cost-effectiveness of approximately $411,000 per ton of THC removal. If the organic HAP fraction of the THC is 24 percent, 2 tpy of organic HAP would be removed at a cost effectiveness of approximately $1.7 million per ton of organic HAP removed. At a cost effectiveness of $411,000 per ton of THC and $1.7 million per ton of organic HAP, we believe the cost of the additional emission reduction is not justified (this is a far higher level than EPA has deemed justified for non-dioxin organic HAP in other MACT standards, for example). In addition to the high cost of control, the additional energy requirements, 7.1 million kwh/yr and 81,000 MMBtu/yr, would be significant. Increased CO_2 emissions attributable to this energy use would be on the order of 9,900 tpy per source.[28] The additional energy demands would also result in increased emissions of NO_X (20 tpy), CO, (8 tpy), SO_2 (27 tpy), and PM10 (1 tpy) per source. Because of the high costs and minimal reductions in THC and organic HAP as well as the secondary impacts and additional energy requirements, we are not selecting this beyond-the-floor option.

Therefore we are proposing for cement kilns an existing source THC emissions limit of 7 ppmvd and a new source limit of 6 ppmvd, measured as propane and corrected to 7 percent oxygen. We are also proposing for an alternative equivalent organic HAP emissions limit of 2 ppmvd for existing kilns and 1 ppmvd for new kilns.

[28] Summary of Environmental and Cost Impacts of Proposed Revisions to Portland Cement NESHAP (40 CFR Part 63, subpart LLL), April 15, 2009.

THC Standard for Raw Material Dryers

Some plants may dry their raw materials in separate dryers prior to or during grinding. See 63 FR at 14204. This drying process can potentially lead to organic HAP and THC emissions in a manner analogous to the release of organic HAP and THC emissions from kilns when hot kiln gas contacts incoming feed materials. The methods available for reducing THC emissions (and organic HAP) is the same technology described for reducing THC emissions from kilns and in-line kiln/ raw mills. Based on the similarity of the emissions source and controls, we are also proposing to set the THC emission limit of materials dryers at 7 ppmvd (existing sources) and 6 ppmvd (new sources).

The current NESHAP has an emissions limit of 50 ppmvd for new greenfield sources. The limit is less stringent than the proposed changes in the THC emissions limits for new (as well as existing) sources. For that reason, we are proposing to remove the 50 ppmvd emissions limit for this rule.

D. Determination of MACT for HCl Emissions From Major Sources

In developing the MACT floor for HCl, we collected over 40 HCl emissions measurements from stack tests based on EPA Methods 321 and 26. Studies have suggested that Method 26 is biased significantly low due to a scrubbing effect in the front half of the sampling train (*see* 63 FR at 14182). Because of this bias, we used the HCl data measured at 27 kilns using Method 321 in determining the proposed floors for existing and new sources. The data in ppmv corrected to 7 percent oxygen (O_2) were ranked by emissions level and the top 12 percent (4 kilns) lowest emitting kilns identified.[29] The top 4 kilns were limited to major sources, and to sources where we had a minimum of three test runs to allow us to account for variability in setting the floor. (Note that neither of these decisions significantly changed the final result of the floor calculation). These emissions data are shown in Table 5. The average of the four lowest emitting kilns is 0.31 ppmvd. The variability for the 4 lowest emitting kilns includes the run-to-run

[29] EPA notes that this floor determination, like the one for THC discussed in the preceding section, raises the issue of whether a floor determination for source categories with 30 sources or greater should be based on the performance of less than five sources. As discussed above, the literal language of section 112 (d)(3)(A) supports basing the floor on the average performance of the best performing 12 per cent of sources, even where the total number of such sources is less than five. We solicited comment on that issue in the preceding section and repeat the solicitation here.

variability of three runs for each stack test and the variability across the 4 lowest emitting kilns.

We calculated the MACT floor (2 ppmvd) based on the upper 99th percentile UPL from the average performance of the 4 lowest emitting kilns and their variances as described earlier. If we had used the five lowest emitting kilns that calculated floor would be 5 ppmvd.[30]

TABLE 5—HCL MACT FLOOR

Kiln	HCl emissions (ppmvd @ 7% O_2)
1	0.02
2	0.02
3	0.22
4, 5 (one stack) [a]	0.97
6	1.21
7	1.32
8	1.76
9	1.95
10	2.57
11	2.57
12	4.30
13	7.15
14	9.84
15	11.06
16	12.83
17	12.83
18	13.60
19	15.65
20	18.54
21	18.93
22	19.19
23	19.86
24	28.28
25	33.06
26	34.68
27	56.14
MACT—Existing	
Average (Top 4)	0.31
Variability ($t*v_T^{0.5}$)	1.94
99th percentile	2
MACT—New	
Average	0.02
Variability ($t*v_T^{0.5}$)	0.12
99th percentile	0.1

[a] Because these two kilns exhaust through a single stack they were treated as a single source for the HCl floor determination.

MACT for new kilns is based on the performance of the lowest emitting kiln. The average HCl emissions for the lowest emitting kiln in this data set is 0.02 ppmv. Using the same statistical technique to apply run-to-run variability for that kiln's emissions data, the HCl MACT floor for new kilns is 0.14 ppmvd at 7 percent O_2.

[30] Development of the MACT Floors for the Proposed NESHAP for Portland Cement, April 15, 2009.

For facilities that do not use wet scrubbers to meet the HCl limit, these standards would be based on a 30-day rolling average, consistent with the proposed use of CEMS (i.e., continuous measurements) for compliance. See section E below.

It should be noted that these emission limits, as well as many of the data from the lowest-emitting kilns, are below the published detection level of the test method (EPA test method 321) as it currently exists for one specific path length and test condition. As discussed further in section IV.I., EPA believes these source-supplied, recent data and detection limits are correct, and EPA is proposing to revise the detection limit for Method 321 in light of this data.

Beyond the Floor Standard for HCl

Based on the HCl emissions data, most kilns (both existing and new) would have to install limestone scrubbers in order to comply with the proposed floors for HCl. Scrubbers are expected to reduce HCl emissions by an average of at least 99 percent. Scrubbers added to reduce HCl emissions will also reduce emissions of SO_2 and will remove oxidized mercury as well.

In examining a beyond-the-floor option for HCl, we evaluated the use of a more efficient HCl scrubber.[31] We assumed a spray chamber scrubber is sufficient to meet the MACT floor, and that scrubber is expected to remove HCl at an efficiency of 99 percent (as just noted). However, we estimate that a packed-bed scrubber would have removal efficiency greater than a spray chamber due to its increased surface area and opportunity for contact between the scrubbing liquid and the acid gases. We estimated the costs and emission reductions for a 1.2 million tpy kiln as the cost-effectiveness results would be similar for all kilns. Annual costs for a packed bed scrubber for a 1.2 million tpy kiln would be approximately $2.2 million.

Assuming a control efficiency of 99.9 percent, the incremental emission reduction using the beyond-the-floor packed-bed scrubber, that is, the reduction in HCl emissions after initial control by the MACT floor control (a spray chamber scrubber), would be about 2.4 tpy. At an annual cost of $2.2 million, the cost effectiveness is $929,000 per ton of HCl removed. Adverse non-air quality impacts, such as energy costs, water impacts, and solid waste impacts would be expected to be

similar for both the floor and beyond-the-floor level of control. See Impacts memorandum, Table 7. Considering the high costs, high cost effectiveness and small additional emissions reduction (and adverse cross-media impacts), we do not believe that a beyond-the-floor standard for HCl is justified.

Other Alternatives for HCl Standards

One option to HCl standards that we considered would be to set a standard that used SO_2 as a surrogate for HCl. The reason to allow this option would be that some kilns already have SO_2 controls and monitors. Acid gas controls that remove SO_2 also remove HCl at equal or greater efficiency.[32] However, we are not proposing this option because we have no data to demonstrate a direct link between HCl emissions and SO_2 emissions—that is—it is unclear that ranking best HCl performers based on SO_2 emissions would in fact identify lowest emitters or best controlled HCl sources. We are requesting comment on the efficacy of using SO_2 as a surrogate for HCl, and data demonstrating that SO_2 is or is not a good surrogate for HCl.

We also considered the possibility of proposing a health-based standard for HCl. Section 112(d)(4) allows the Administrator to set a health-based standard for a limited set of HAP: ''pollutants for which a health threshold has been established''. EPA may consider that threshold, with an ample margin of safety, in establishing standards under section 112 (d). In the 2006 rule, EPA determined that HCl was a ''health threshold pollutant'' and relied on this authority in declining to establish a standard for HCl. 71 FR at 76527–29. We are taking comment on a health-based standard.

However, we are not proposing a health-based standard here. The choice to propose a MACT standard, and not a health-based standard, is based on the fact that, in addition to the direct effect of reducing HCl emissions, setting a MACT standard for HCl is anticipated to result in a significant amount of control for other pollutants emitted by cement kilns, most notably SO_2 and other acid gases, along with condensable PM, ammonia, and semi-volatile compounds. For example, the additional reductions of SO_2 alone attributable to the proposed MACT standard for HCl are estimated to be 126,000 tpy in the fifth year following promulgation of the HCl standard.[33] These are substantial

reductions considering the low number of facilities. Although MACT standards may only address HAP, not criteria pollutants, Congress fully expected MACT standards to have the collateral benefit of controlling criteria pollutants as well, and viewed this as an important benefit of the air toxics program.[34] It therefore is appropriate that EPA consider such benefits in determining whether to exercise its discretionary section 112 (d)(4) authority.

Though this is not our preferred approach for the reasons discussed above, we request comment on a health-based standard for HCl and other information on HCl health and environmental effects we should consider. Commenters should also address the issue of other environmental benefits which might result from control of HCl at a MACT level, including control of other acid gases and control of secondary PM (i.e., PM condensing from acid gases). We will consider these comments in making an ultimate determination as to whether to adopt a health-based standard for HCl.

Finally, we determined that even if we opted to set a health-based standard, we would still need to set a numerical emission limit given that section 112(d)(4) requires that an actual emission standard be in place. In order to determine this level, we conducted a risk analysis of 68 facilities using a screening level dispersion model (AERSCREEN). Utilizing site specific stack parameters and worst-case meteorological conditions, AERSCREEN predicted the highest long term ground level concentration surrounding each facility. The results of this analysis indicated that an emission limit of 23 ppmv or less would result in no exceedances of the RfC for HCl with a margin of safety.[35] Although, as discussed above, EPA is not proposing a health-based standard, EPA solicits comment on the level of 23 ppmv (as a not-to-exceed standard) should EPA decide to pursue the option of a health-based standard.

E. Determination of MACT for Non-Volatile Metals Emissions From Major and Area Sources

PM serves as a surrogate for non-volatile metal HAP (a determination upheld in *National Lime Ass'n,* 233 F. 3d at 637–39). Existing and new major sources are presently subject to a PM

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[31] We could identify no other control options for acid gas removal that would consistently achieve emissions reduction beyond the floor level of control.

[32] Institute of Clean Air Companies. Acid Gas/SO_2 Control Technologies. Wet Scrubbers. *http://www.icac.com/i4a/pages/index.cfm?pageid=3401*

[33] Summary of Environmental and Cost Impacts of Proposed Revisions to Portland Cement NESHAP (40 CFR Part 63, subpart LLL), April 15, 2009.

[34] *See* S. Rep. No. 101–228, 101st Cong. 1st sess. at 172.

[35] Derivation of a Health-Based Stack Gas Concentration Limit for HCl in Support of the National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry, April 10, 2009.

limit of 0.3 lb/ton of feed which is equivalent to 0.5 lb/ton clinker. EPA is proposing to amend this standard, and also is proposing PM standards for existing and new area source cement kilns. In all instances, EPA is proposing to revise these limits because they do not appear to represent MACT, but rather a level which is achievable by the bulk of the industry. See 63 FR at 14198. This is not legally permissible. *Brick MACT,* 479 F. 3d at 880–81.

For this proposal, we compiled PM stack test data for 45 kilns from the period 1998 to 2007. EPA ranked the data by emissions level and the lowest emitting 12 percent, 6 kilns, was used to develop the proposed existing source MACT floor.

As for the previous floors discussed above, we calculated the variances of each lowest emitting kiln and accounted for variability by determining the 99th percentile UPL as described earlier. The average performance for each of the lowest emitting kilns was generally based on the average of 3 runs which comprise a stack test. Consequently, the variability represents the short term variability at a kiln (e.g., a 3 hour stack test period) and the variability across the 6 lowest emitting kilns. (This analysis is consistent with the way we would propose to determine compliance, i.e., conduct 3 runs to perform a stack test.) For the lowest emitting kiln (whose performance was used to establish the proposed new source floor), there were only 3 runs and the results of these runs were relatively close together, a circumstance which would lead to an inaccurate (and inadequate) estimation of the kiln's long term variability were these data to be used for that purpose. However, we know the 6 lowest emitting kilns are equipped with fabric filters that are similar with respect to performance because they are similar in design and operation, and the larger dataset provides a much better estimate of the variability associated with a properly operated fabric filter of this design. Consequently, for the proposed new source floor, we used the average performance of the lowest emitting kiln and the variability associated with the best fabric filters to assess the lowest emitting kiln's variability.

The emissions for the top six kilns ranged from 0.005 to 0.008 lb/ton clinker. Accounting for variability as described above, we calculated an existing source MACT floor of 0.085 lb/ton clinker. For new kilns, the limit is based on the best lowest emitting kiln, which has emissions of 0.005 lb/ton clinker. Accounting for variability results in a calculated new source

MACT floor of 0.080 lb/ton clinker. These PM emissions data are summarized in Table 6.

TABLE 6—PM MACT FLOOR

Kiln	PM emissions (lb/ton clinker)
1	0.005
2	0.0075
3	0.0075
4	0.0081
5	0.0108
6	0.0232
MACT—Existing	
Average	0.010
Variability ($t*v_T^{0.5}$)	0.075
99th percentile	0.085
MACT—New	
Average	0.005
Variability ($t*v_T^{0.5}$)	0.075
99th percentile	0.080

EPA is also proposing to set a PM standard based on MACT for existing and new area source cement kilns. Portland cement kilns are a listed area source category for urban HAP metals pursuant to section 112(c)(3), and control of these metal HAP emissions (via the standard for the PM metal surrogate) is required to ensure that area sources representing 90 percent of the area source emissions of urban metal HAP are subject to section 112 control, as required by section 112(c)(3). EPA is proposing that this standard reflect MACT, rather than GACT, because there is no essential difference between area source and major source cement kilns with respect to emissions of either HAP metals or PM. Thus, the factors that determine whether a cement kiln is major or area are typically a function of the source's HCl or formaldehyde emissions, rather than its emissions of HAP metals. As a result, there are kilns that are physically quite large that are area sources, and kilns that are small that are major sources. Both large and small kilns have similar HAP metal and PM emissions characteristics and controls. Given that EPA is developing major and area sources for PM at the same time in this rulemaking, a common control strategy consequently appears warranted for these emissions. We thus have included all cement kilns in the floor calculations for the proposed PM standard, and have developed common PM limits based on MACT for both major and area sources.

Consideration of Beyond-the-Floor Standards

There is very little difference in the proposed floor levels for PM for either new or existing sources, and we believe that a well-performing baghouse represents the best performance for PM. To evaluate beyond-the-floor controls, we examined the feasibility of replacing an existing ESP or baghouse with a new baghouse equipped with membrane bags which might result in a slightly better performance for PM (reflected in the modest increment between the proposed floors for new and existing sources). We estimated the costs and emission reductions for a 1.2 million tpy kiln. The cost-effectiveness results will be similar for all kilns. Under the MACT floor, baseline emissions of 0.34 lb/ton of clinker are reduced to 0.085 lb/ton of clinker, a reduction in PM emissions of 51 tpy. Further reducing emissions down to the proposed PM limit for new sources would incrementally reduce emissions by an additional 3 tpy. The annualized cost of a baghouse with membrane bags would be $1.73 million per year, or a cost effectiveness of $576,000/ton of PM (far greater than any PM reduction EPA has ever considered achievable under section 112(d)(2) or warranted under other provisions of the Act which allow consideration of cost). Assuming that the metal HAP portion of total PM is 1 percent, the cost effectiveness would be about $58 million per ton of metal HAP. Based on these costs and the small resulting emission reductions, we believe a PM beyond-the-floor standard is not justified for existing sources and not technically feasible for new sources.

Other Standards for PM

Emissions from fabric filters or ESP are typically measured as a concentration (grains per dry standard cubic feet) and then converted to the desired format using standard conversions (54,000 dry cubic feet per minute of exhaust gas per ton of feed, 1.65 tons of feed per ton of clinker). All of the data used to set the proposed PM emissions limit were converted in that fashion. Therefore, the basis of the proposed PM standard is actually a concentration level. There are certain cases where this conversion must be adjusted, however. Some kilns and kiln/in-line raw mills combine the clinker cooler gas with the kiln exhaust and send the combined emissions to a single control device. There are significant energy savings (and attendant greenhouse gas emission reductions) associated with this practice, since heat can be extracted from the clinker cooler

exhaust. However, there need to be different conversion factors from concentration to mass per unit clinker. In the case where clinker cooler gas is combined with the kiln exhaust the standard would need to be adjusted to allow for the increased gas flow. If this allowance is not made, then the effective level of the PM standard would be reduced (the result being that the proposed standard would not properly reflect best performing kilns' performance, and also discouraging use of a desirable energy efficiency measure). *See* 73 FR at 64090–91 (Oct. 28, 2008). Therefore, we are proposing that facilities that combine the kiln and clinker cooler gas flows prior to the PM control would be allowed to convert the equivalent concentration standards (which are 0.0067 or 0.0063 lb/ton clinker for new and existing sources, respectively) to a lb/ton clinker standard using their combined gas flows (dry standard cubit feet per ton of feed). It should be noted that this provision will not result in any additional PM emissions to the atmosphere compared to the same kiln if it did not combine the clinker cooler and kiln exhaust, and may actually decrease emissions slightly due to improvements in overall process efficiency.

In addition to proposing to amend the PM standard for kilns we are proposing to similarly amend the PM emissions limit for clinker coolers. Fabric filters are the usual control for both cement kilns and clinker coolers. As EPA noted in our proposed revision to Standards of Performance for Portland Cement Plants (73 FR 34078, June 16, 2008) we believe that the current clinker cooler controls can meet the same level of PM control that can be met by the cement kiln. Therefore, we are proposing as MACT the same PM emissions limits for both clinker coolers and kilns.

In sum, because we believe that the costs of a beyond-the-floor standard for PM are not justified, we are proposing a PM standard for existing kilns and clinker coolers of 0.085 lb/ton of clinker, and for new kilns and clinker coolers of 0.080 lb/ton of clinker.

F. Selection of Compliance Provisions

For compliance with the mercury emissions standards we are proposing to require continuous or integrated monitoring (either instrument based or sorbent trap based). As explained earlier in this preamble, we do not believe that short term emission tests provide a good indication of long term mercury emissions from cement kilns. We considered the option of requiring cement kilns to measure and analyze mercury content of all inputs to the kiln,

as was done to gather the data used to develop the proposed standards. However, that data gathering was done based on a daily analysis of all inputs to the kiln. If we were to make that the compliance option and require daily analyses, the cost would be comparable to the cost of a mercury monitoring system. If we were to allow less frequent analyses to reduce costs, then we are concerned that the accuracy may be reduced (and the standard would no longer be implemented in the same manner as it was developed). In addition, in order to meet the proposed mercury emission limits, we anticipate that many facilities will install add-on controls, which will create another variable that would make the measurement of mercury content of inputs (instead of continuous or integrated stack measurement) significantly less accurate. In order to determine an outlet emissions rate based on input measurements, the control device would have to be tested under various operating conditions to insure that the removal efficiency could be accurately calculated, and continuous monitoring of control device parameters (i.e. parametric monitoring) would be necessary. Given issues related to input monitoring, and the cost associated with control device monitoring, plus a desire to implement the standard in a manner consistent with its means of development, we believe that a continuous or integrated mercury measure at the stack is the preferred option, and are proposing that sources demonstrate compliance with mercury monitoring systems that meet either the requirements of PS–12A or PS–12B.[36]

We are not aware of any cement kilns in the U.S. that have continuous mercury monitoring systems. However, there are numerous utility boilers that have installed and certified mercury CEMS. We see no technical basis to say that these continuous mercury monitoring systems will not work as well on a cement kiln as they do on a utility boiler. In addition, we are aware that there are 34 cement kilns that have operating continuous mercury monitors in Germany.[37] There were problems in the application of continuous mercury monitoring systems when they were first installed on these German cement kilns, but their performance has been

improved so they now provide acceptable performance. We are requesting comment on the feasibility of applying mercury continuous monitoring systems to cement kilns in the United States.

Generally, we propose and promulgate monitoring system performance specifications and performance test methods in accordance with their development, independent of publication of source category emissions control regulations. There are circumstances dictating that we publish such measurement procedures and requirements simultaneously with an emissions regulation because of integral technical relationships between the standard and the monitoring performance specifications and test methods and because such a combination is convenient and cost-effective. Such combined publication also allows commenters to prepare comprehensive comments on not only the performance specifications or test methods but also on their specific applications. In today's notice, we are reproposing to amend 40 CFR part 60, appendix B by adding Performance Specification 12A—Specifications and Test Procedures For Total Vapor Phase Mercury Continuous Emission Monitoring Systems in Stationary Sources. We are also proposing to amend 40 CFR part 60, appendix B by adding Performance Specification 12B—Specifications and Test Procedures For Monitoring Total Vapor Phase Mercury Emissions from Stationary Sources Using a Sorbent Trap Monitoring System, and proposing to amend 40 CFR part 60 Appendix F by adding Procedure 5—Quality Assurance Requirements for Vapor Phase Mercury Continuous Monitoring Systems Used at Stationary Sources for Compliance Determination.[38]

We previously promulgated versions of these performance specifications with the Clean Air Mercury Rule (CAMR). On March 14, 2008, the Court of Appeals for the District of Columbia Circuit issued its mandate vacating CAMR on other grounds not related to these performance specifications. We are reproposing these performance specifications today. We also want to make clear that these performance specifications are generally applicable,

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[36] Information related to the development of Performance Specifications 12A and 12B can be found in dockets EPA–HQ–OAR–2002–0056 and EPA–HQ–OAR–2007–0164.

[37] E-mail and attachment. M. Bernicke, Federal Environment Agency to A. Linero, Florida Department of Environmental Protection. February 8, 2009.

[38] Notwithstanding the connections between the performance specifications and this proposal, the mercury monitoring performance specifications remain technically independent from the proposed standards, as they exist independent of the proposed standard (see following paragraph in text above). Furthermore, EPA has adopted, and would continue to adopt such specifications and protocols, whether or not it were amending the NESHAP for portland cement kilns.

i.e. apply wherever mercury CEMS are required and so are not limited in applicability to portland cement kilns.

In PS–12A, we refer to and apply a span value, a Hg concentration that is constant and related (i.e., twice) to the applicable emissions limit. The span value is used in assessing the mercury CEMS performance and in defining calibration standards. We expect that mercury emissions from these facilities to be highly variable including short term periods of concentrations exceeding the span value. We request comment on whether the proposed approach for establishing CEMS calibration ranges and assessing performance will adequately assure the accuracy of the reported average emissions that might include measurements at concentrations above the span value. If not, what alternative approaches should we consider?

For demonstrating compliance with the proposed THC emissions limit we are proposing the use of a CEMS meeting the requirements of PS–8A. This requirement already exists for new kilns. There are existing kilns that already have THC CEMS, and indeed, EPA used CEMS data from these kilns as the basis for the proposed standards. As previously noted, changes in raw materials can materially affect THC emissions without any obvious indication that emissions have changed. For this reason, and to be consistent with the means by which EPA developed the proposed standard, we believe (subject to consideration of public comment) a CEMS is necessary to insure continuous compliance.

If a source chooses to comply with the proposed alternative equivalent organic HAP emissions limit,[39] rather than the THC limit, we are not proposing the use of a continuous monitor to directly measure total organic HAP. We are instead proposing to use EPA Method 320 to determine the actual organic HAP content of the THC at a specific facility. Thereafter, compliance would be measured based on the facility's THC measurement at the time of the Method 320 test for organics. The proposed rule thus provides that THC is measured concurrently, using a CEM, at the time of a Method 320 test and that if the Method 320 test indicates compliance with the alternative organic HAP standard, then the THC emissions

measured using a CEMS would become that facility's THC limit. That THC limit would have to be met based on a 30-day average, which (as noted) would be measured with a CEM.

For demonstrating compliance with the proposed PM emissions limit, we are proposing the installation and operation of a bag leak detection (BLD) system, along with stack testing using EPA method 5 conducted at a frequency of five years. If an ESP is used for PM control, an ESP predictive model to monitor the performance of ESP controlling PM emissions from kilns would be required, as well as a stack performance test conducted at a frequency of five years. As an alternative a PM CEMS that meets the requirements of PS–11 may be used. We are also proposing to eliminate the current requirement of using an opacity monitor to demonstrate continuous requirement with a PM standard for kilns and clinker coolers as use of an opacity monitor would be superfluous under the monitoring regimes we are proposing (an issue discussed further in the following paragraph).

We previously proposed use of BLD systems for PM as part of our review of the Portland Cement Standards for Performance under section 111 of the Act (73 FR 34072, June 16, 2008). Our rationale for extending the requirement to existing kilns is that given the stringent level of the proposed PM emissions limits, we do not believe that opacity is an accurate indicator of compliance with the proposed PM emissions limit. As just noted, were we to adopt this requirement, we would also remove the opacity standard and opacity continuous monitoring requirements for any source that uses a PM CEMS or bag leak detector to determine compliance with a PM standard. (Some opacity requirements, such as those for materials handling operations, would remain in place.)

As also just noted, we are also proposing to allow the use of a PM CEMS as an alternative to the BLD to determine compliance. However, we are specifically soliciting comment on making the use of a PM CEMS a requirement. We note that in the original 1999 rule we included a requirement that kilns and clinker install and maintain a PM CEMS to demonstrate compliance with the PM emissions limit, but we deferred compliance with that requirement until EPA had developed the necessary performance specification for a PM CEMS. See 64 FR at 31903–04. These performance specifications are now available. In addition, continuous monitors give a far better measure of

sources' performance over time than periodic stack tests. Moreover, as discussed below, we do not believe that use of a PM CEMS would increase the stringency of the standard. Therefore, we are soliciting comment on the option of requiring use of PM CEMS to monitor compliance with a PM standard.

For demonstrating compliance with the HCl emissions limit we are proposing the use of a CEMS that meets the requirements of PS–15 if the source does not use a limestone wet scrubber for HCl control. As with mercury and THC, HCl emissions can be significantly affected by inputs to the kiln without any visible indications. For this reason we believe that a continuous method of compliance is warranted, with one exception. If the source uses a limestone wet scrubber for HCl control, we believe that HCl emissions will be minimal even if kiln inputs change because limestone wet scrubbers are highly efficient in removing HCl. For this reason we are proposing to require sources using a limestone wet scrubber to perform an initial compliance test using EPA Test Method 321, and to test every 5 years thereafter. These EPA Test Method 321 testing requirements would also apply to sources using CEMS. In addition, for sources with in-line raw mills that are not using a wet scrubber for HCl control, we are proposing to require testing with raw mill on and raw mill off. Our review of the available data where a kiln was tested with raw mill on/raw mill off indicated that the change in raw mill operating conditions had a significant influence on HCl emissions.[40] We are specifically requesting comment on our assumption that a wet scrubber will consistently maintain a low level of HCl emissions, even if feed conditions change, and thus that it is appropriate to use a short term performance test rather then a continuous monitor for kilns that install wet scrubbers.

One option we considered would be to require SO$_2$ monitoring in lieu of HCl monitoring. The reason to allow this option would be that some kilns already have SO$_2$ monitors, and this monitoring technology is less expensive and more mature than HCl monitors. If a source is using a wet scrubber for HCl control, then indication that the scrubber is removing SO$_2$ is also a positive indication that HCl is being removed. However, we are not proposing this because we have no data to demonstrate a direct link between HCl emissions and SO$_2$ emissions. For example, if a source has a scrubber-equipped kiln and notes

[39] We assume that sources would do so if they cannot meet the (proposed) THC standard of 7 ppmvd for existing sources and 6 ppmvd for new sources, but can demonstrate that their organic HAP emissions are lower than the (alternative) MACT limit for organics (or, put the other way, that their THC emissions contain more than the normal amount of non-HAP organics).

[40] E-mail and attachments from K. Barnett to J. Pew, Earthjustice. September 2, 2008.

an SO$_2$ emissions increase, is the increase due to a drop-off in scrubber performance or to an increase in sulfur compounds in the raw materials? If it is simply a change in raw materials' sulfur content, then the change may have no relevance to HCl emissions. If the SO$_2$ emission increase is due to a reduction in scrubber efficiency, then the change in SO$_2$ emission might mean that HCl emissions have changed. We are requesting comment on the efficacy of using SO$_2$ as a surrogate for HCl for purposes of monitoring compliance, and data demonstrating whether SO$_2$ is a good surrogate for HCl for this purpose.

One issue in using a CEMS to measure compliance with these proposed standards is whether the use of a continuous monitor results in an increase in the stringency of the standard, if that standard was developed based on short term emissions tests or other data and is a not-to-exceed standard. As explained earlier, EPA obtained mercury data from thirty daily samples of fuel and raw materials and used statistical techniques to account for further variability in inputs, operation, and measurement. The proposed hydrogen chloride emissions limits were derived using statistical techniques to account for variability in components such as fuel and raw material, process operation, and measurement procedures. The proposal would require direct, continuous measurement of mercury and, for those facilities not using a wet scrubber as a control device, hydrogen chloride. Compliance with these emissions limits for these facilities is determined by assessing the 30-day average emissions with the appropriate emissions limit. With respect to mercury, as explained in section IV.B.1. above, not only do continuous monitoring and 30-day averaging accord well with the means used to gather these underlying data, but continuous monitoring and 30-day averaging are needed because cement kilns do not emit mercury in relatively equal amounts day-by-day but, due to the mill-on/mill-off phenomenon, in varying small and large amounts. With respect to hydrogen chloride, use of a 30-day average provides a way to account for the potential short-term variability inherent in values obtained from continuous data collection and analysis, so that CEM-based compliance, in combination with 30-day averaging, does not make the proposed standard more stringent than a not-to-exceed standard based on stack testing. Therefore, subject to consideration of public comment, we believe the use of continuous monitoring techniques for

mercury and HCl, in combination with 30-day averaging times, is appropriate.

G. Selection of Compliance Dates

For existing sources we are proposing a compliance date of 3 years after the promulgation of the new emission limits for mercury, THC, PM, and HCl to take effect. This is the maximum period allowed by law. See section 112(i)(3)(A). We believe a 3-year compliance period is justified because most facilities will have to install emissions control devices (and in some cases multiple devices) to comply with the proposed emissions limits.

In the December 2006 rule amendments we included operating requirements relating to the amount of cement kiln dust wasted versus dust recycled, and also a requirement that the source certify that any fly ash used as a raw material did not come from a boiler using sorbent to remove mercury from the boiler's exhaust. These provisions are unnecessary should EPA adopt the proposed standards, and EPA is proposing to remove them. Removal of these requirements would take effect once the affected source is required to comply with a numerical mercury limit.

For new sources, the compliance date will be the date of publication of the final rule or startup, whichever is later. In determining the proposal date that determines if a source is existing or new, we are retaining the date of December 5, 2005 for HCl, THC, and mercury, i.e., any source that commenced construction after December 5, 2005, is a new source for purposes of the emission standards changed in these amendments. For PM, we are proposing that the date that determines if a source is existing or new will be May 6, 2009.

In proposing this determination, we considered three possible dates, including March 24, 1998; December 5, 2005; and the proposal date of these amendments. Section 112(a)(4) of the Act states that a new source is a stationary source if "the construction or reconstruction of which is commenced after the Administrator first proposes regulations under this section establishing an emissions standard applicable to such source." "First proposes" could refer to the date EPA first proposes standards for the source category as a whole, or could refer to the date the agency first proposes standards under a particular rulemaking record. The definition is also ambiguous with regard to whether it refers to a standard for the source as a whole, or to a HAP-specific standard (so that there could be different new source standards for

different HAP which are regulated at different times).

We believe that the section 112(a)(4) definition can be read to apply pollutant-by-pollutant, and can further be read to apply to the rulemaking record under which a standard is developed. The evident intent of the definition plus the substantive new source provisions is that it is technically more challenging and potentially more costly to retrofit a control system to an existing source than to incorporate controls when a source is initially designed. *See* 71 FR at 76540–541. If, for example, we were to choose March 24, 1998, as the date to delineate existing versus new sources, then numerous kilns that would be required to meet new source standards would have to retrofit controls that they could not have reasonably anticipated at the time the source was originally designed.[41]

We also considered selecting the proposal date of these amendments as the date that delineates new and existing sources but, for HAP other than PM, rejected that option. The mercury and THC standards being proposed here arise out of the rulemaking proposed on December 2, 2005. This notice is issued in response to petitions for reconsideration of the standards from that rulemaking. The proposed standard for HCl likewise arises out of the rulemaking proposed in December 2, 2005 and its reconsideration, where EPA proposed standards for HCl. *See* 70 FR at 72335–37. Thus, it is reasonable to view the December 2, 2005, proposal as the date on which EPA first proposed standards for HCl as part of this rulemaking. We are soliciting comment on the appropriate date to regard the standards for THC and HCl as being "first proposed."

For PM, the choices are the 1998 date on which EPA proposed PM standards, or the date of this proposal (the first

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[41] Two other provisions of the Act are pertinent here as well. Section 112(i)(1) requires preconstruction review for, among other sources, all new sources subject to a new source standard. Such preconstruction review would be impossible if new sources included sources which began operation pursuant to an historic new source standard, which standard was later amended. Such a source would, of course, have already been operating. In addition, section 111(a)(2) defines "new source" as a stationary source "the construction or reconstruction of which is commenced after the publication of regulations (or, if earlier), "proposed regulations prescribing a standard of performance under this section." Such standard must be reviewed periodically at least every 8 years. EPA's longstanding interpretation of this provision is that only sources commencing construction (or which are reconstructed) after the date of a revised new source performance standard would be subject to that revised standard. There seems no evident reason to interpret the section 112(a)(4) definition differently from the section 111(a)(2) definition.

date EPA proposed revision to the PM standard, based on a new rulemaking record). Subject to consideration of public comment, we believe the appropriate date is the date of this proposal. *See* 71 FR at 76540–41 (applying new source standards to sources which began operation many years in the past is inconsistent with idea that new source standards may be more stringent because they can be implemented at time of initial design of the source, thus avoiding retrofit expense).

H. Discussion of EPA's Sector-Based Approach for Cement Manufacturing

What is a Sector-Based Approach?

Sector-based approaches are based on integrated assessments that consider multiple pollutants in a comprehensive and coordinated manner to manage emissions and CAA requirements. One of the many ways we can address sector-based approaches is by reviewing multiple regulatory programs together whenever possible. This approach essentially expands the technical analyses on costs and benefits of particular technologies, to consider the interactions of rules that regulate sources. The benefit of multi-pollutant and sector-based analyses and approaches include the ability to identify optimum strategies, considering feasibility, costs, and benefits across the different pollutant types while streamlining administrative and compliance complexities and reducing conflicting and redundant requirements, resulting in added certainty and easier implementation of control strategies for the sector under consideration.

Portland Cement Sector-Based Approach

Multiple regulatory requirements currently apply to the cement industry sector. In order to benefit from a sector-based approach for the cement industry, EPA analyzed how the NESHAP under reconsideration relates to other regulatory requirements currently under review for portland cement facilities. The requirements analyzed affect HAP and/or criteria pollutant emissions from cement kilns and cover the NESHAP reconsideration, area source NESHAP, NESHAP technology review and residual risk, and the New Source Performance Standard (NSPS) revision. The results of our analyses are described below.

The first relationship is the interaction between the NESHAP THC standard and the co-benefits for VOC and carbon monoxide (CO) control. The THC limit for new sources in the

NESHAP will also control VOC and CO to the limit of technical feasibility. For this reason the proposed NSPS relies on the THC NESHAP limit for new sources to represent best demonstrated technology (BDT) for VOC and CO for this source category. *See* 73 FR 34082.

Another interaction relates to the more stringent PM emission limit being proposed under the NESHAP reconsideration. As noted, there is a legal requirement to regulate listed urban HAP metals from area source cement kilns under section 112(c)(3), and we are proposing PM standards for area source cement kilns pursuant to that obligation.[42] In addition, we are required under CAA section 112(f) to evaluate the residual risk for toxic air pollutants emitted by this source category and to perform a technology review for this source category under section 112(d)(6). Revisions to the PM standard for new and existing major sources under the NESHAP will maximize environmental benefits due to the achievement of greater PM emission reductions and will also reduce the possibility for additional control requirements as we consider the implication these revisions have in developing future requirements under residual risk and technology review increasing certainty to this sector.

To reduce conflicting and redundant requirements for the cement industry regarding the control of PM emissions, EPA is proposing to place language in both the NESHAP and the NSPS making it clear that if a particular source has two different requirements for the same pollutant, they are to comply with the most stringent emission limit, and are not subject to the less stringent limit.

Another issue being addressed as part of our cement sector strategy is condensable PM. Particulate emissions consist of both a filterable fraction and a condensable fraction. The condensable fraction exists as a gas in an exhaust stream and condenses to form particulate once the gas enters the ambient air. In this rulemaking, AP–42 emission factors were used to calculate emission reductions of $PM_{2.5}$ filterable due to the PM standard.[43] There are insufficient data to assess if the cement industry is a significant source of condensable PM. The measurement of condensable PM is important to EPA's goal of reducing ambient air concentrations of $PM_{2.5}$. While the Agency supports reducing condensable

PM emissions, the amount of condensable PM captured by Method 5 (the PM compliance test method specified in the NSPS) is small relative to methods that specifically target condensable PM, such as Method 202 (40 CFR part 51, Appendix M). Since promulgation of Method 202 in 1991, EPA has been working to overcome problems associated with the accuracy of Method 202 and has proposed improvements to Method 202 on March 25, 2009 (74 FR 12970). EPA expects promulgation of these improvements within a year. Barring promulgation of these improvements, EPA has identified already-approved procedures to be conducted in conjunction with Method 202; these procedures reduce the impact of potential problems in accounting for the condensable portion of $PM_{2.5}$.[44] The condensable portion of PM will become important as the $PM_{2.5}$ implementation rule, which requires consideration of both the filterable and condensable portions of $PM_{2.5}$ for state implementation plan, new source review, and prevention of significant deterioration decisions, begins implementation on January 1, 2011. (*see* 72 FR 20586, April 25, 2007.) In order to assist in future sector strategy development, we are considering any data available on the levels of condensable PM emitted by the cement industry; any condensable PM emission test data collected using EPA Conditional Method 39, EPA Method 202 (40 CFR part 51, Appendix M), or their equivalent, factors affecting those condensable PM emissions, and potential controls. We welcome submission of these data, as well as comments and suggestions on whether or how to include the condensable portion of $PM_{2.5}$ in the PM emissions limit.

Another benefit of evaluating regulatory requirements across pollutants in the context of a sector approach is addressing the relationship between the regulatory requirements for SO_2, mercury, and HCl emissions. Although SO_2 emission reductions would be required in the proposed NSPS, mercury and HCl emissions reduction are required in the Portland Cement NESHAP reconsideration. The integrated analysis of these regulatory requirements showed that alkaline wet scrubbers achieve emission reductions for SO_2, mercury, and HCl from cement kilns. This control technology maximizes the co-benefits of emission

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[42] Memo from K. Barnett, EPA to Sharon Nizich, EPA. Extension of Portland Cement NESHAP PM limits to Area Sources. May 2008.

[43] AP–42, Fifth Edition, Volume I Chapter 11: Mineral Products Industry. Section 11.6 January 1995 p. 11.6–15.

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[44] *See* response to the third question of Frequently Asked Questions for Method 202, available at *www.epa.gov/ttn/emc/methods/method202.html#amb.*

reductions while minimizing cost. For example, a new facility that under the NSPS determines a moderate level of SO_2 reduction might consider using a lime injection system because it is lower cost. However, if the same facility would have to use some type of add-on control to meet the NESHAP new source mercury and/or HCl emission limits, instead of considering each standard in isolation, would determine that the most cost effective overall alternative might be to use a wet scrubber for controlling SO_2, mercury, and/or HCl. By coordinating requirements at the same time, the facility can determine which control technology minimizes the overall cost of air pollution control and can avoid stranded costs associated with piecemeal investments in individual control equipment for SO_2, mercury, and/or HCl.

The integrated sector-based analysis for the cement industry also showed that SO_2 emission reductions from existing sources are possible as co-benefits if wet scrubbers are employed to control either mercury and/or HCl from existing sources under the NESHAP. We evaluated the co-benefits of the use of wet scrubbers in reducing SO_2 and the effects on $PM_{2.5}$ and $PM_{2.5}$ nonattainment areas (NAA), including the co-benefits of reducing SO_2 in mandatory Federal Class I areas (Class I areas).[45]

Another interaction addressed in the context of the sector approach is monitoring requirements. To ensure that our sector strategy reduces administrative and compliance complexities associated with complying with multiple regulations, our rulemaking recognizes that where monitoring is required, methods and reporting requirements should be consistent in the NSPS and NESHAP where the pollutants and emission sources have similar characteristics.

New Source Review and the Cement Sector-Based Approach

The proposed MACT requirements for cement facilities have a potential to result in emissions reductions of air pollutants that are regulated under the CAA's major new source review (NSR) program. Specifically, operating a wet scrubber to meet MACT requirements for mercury and/or HCl at a portland cement plant has the added

environmental benefit of reducing large amounts of SO_2, a regulated NSR pollutant. For a typical wet scrubber, with a 90 percent removal efficiency for SO_2, this could result in an annual reduction of thousands of tons of SO_2 from an uncontrolled kiln (reduction will vary greatly depending on the type and age of the kiln, sulfur content of feed materials, and fuel type). These collateral SO_2 and other criteria pollutant emissions reductions resulting from the application of MACT may be considered for ''netting'' and ''offsets'' purposes under the major NSR program.

The term ''netting'' refers to the process of considering certain previous and prospective emissions changes at an existing major source over a contemporaneous period to determine if a ''net emissions increase'' will result from a proposed modification. If the ''net emissions increase'' is significant, then major NSR applies. Section 173(a)(1)(A) of the Act requires that a major source or major modification planned in a nonattainment area obtain emissions offsets as a condition for approval. These offsets are generally obtained from existing sources located in the vicinity of the proposed source and must offset the emissions increase from the new source or modification and provide a net air quality benefit.

An emissions reduction must be ''surplus,'' among other things, to be creditable for NSR netting and offset purposes. Typically emission reduction required by the CAA are not considered surplus. For example, emissions reductions already required by an NSPS, or those that are relied upon in a State implementation plan (SIP) for criteria pollutant attainment purposes (e.g., Reasonable Available Control Technology, reasonable further progress, or an attainment demonstration), are not creditable for NSR offsets (or netting) since this would be ''double counting'' the reductions. Also, any emissions reductions already counted in previous major modification ''netting'' may not be used as offsets. However, emissions reductions that are in excess of, or incidental to the MACT standards, are not precluded from being surplus even though they result from compliance with a CAA requirement. Therefore, provided such reductions are not being double counted, they may qualify as surplus and can be used either as netting credits at the source or be sold as emissions offsets to other sources in the same non-attainment area provided the reductions meet all otherwise applicable CAA requirements for being a creditable emission reduction for use as an offset or for netting purposes.

Since SO_2 is presumed a $PM_{2.5}$ precursor in all prevention of significant deterioration and nonattainment areas unless a state specifically demonstrates that it is not a precursor, SO_2 may be used as a emission reduction credit for either SO_2 or $PM_{2.5}$, at an offset ratio is 40-to-1 (40 tons of SO_2 to 1 ton of $PM_{2.5}$) See 72 FR 28321–28350 (May 16, 2008).

Given that many states have concerns over a lack of direct $PM_{2.5}$ emissions offsets for areas that are designated nonattainment for $PM_{2.5}$, cement plants that generate creditable reductions of SO_2 from applying MACT controls may realize a financial benefit if they can sell the emissions credits as SO_2 and/or $PM_{2.5}$ offsets. It is difficult to quantify the exact financial benefit, since offset prices are market driven and vary widely in the U.S.

National Ambient Air Quality Standards

Portland cement kilns emit several pollutants regulated under the NAAQS, including $PM_{2.5}$, SO_2, NO_X, and precursors to ozone. In addition, several pollutants emitted from cement kilns are transformed in the atmosphere into $PM_{2.5}$, including SO_2, NO_X, and VOC. Emissions of NO_X and VOC are also precursors to ozone. Thus, implementation of the Cement NESHAP, which could lead to substantial reductions in criteria pollutants and precursor emissions as co-benefits, could help areas around the country attain these NAAQS.

Screening analyses showed that 23 cement facilities were located in 24hr $PM_{2.5}$ NAA and 39 facilities in Ozone NAA. Control strategies for reducing emissions of THC, mercury, HCl, and PM from cement plants under the Cement NESHAP have the co-benefits of reducing SO_2 and direct $PM_{2.5}$ emissions. These co-benefits could provide states with emission reductions for areas required to have attainment plans.

Regional Haze, Reasonable Progress, and the Cement Sector-Based Strategy

The Cement NESHAP can also have an impact on regional haze. Under section 169A of the CAA, States must develop SIPs to address regional haze. The purpose of the regional haze program is the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I areas which impairment results from manmade air pollution under the regional haze regulations, the first Regional Haze SIPs were due in December 2007 (40 CFR 51.308(b)); these SIP submittals must address several key elements, including Best Available Retrofit Technology (BART),

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[45] Areas designated as mandatory Class I Federal areas are those national parks exceeding 6,000 acres, wilderness areas and national memorial parks exceeding 5,000 acres, and all international parks which were in existence on August 7, 1977. Visibility has been identified as an important value in 156 of these areas. *See* 40 CFR part 81, subpart D.

Reasonable Progress, and long-term strategies. Screening analyses showed that there are 14 cement facilities within a distance of 50 km Class 1 Areas.

A potential benefit for cement facilities utilizing wet scrubbers to comply with this rule is a level of certainty for satisfying a facility's BART requirements for SO_2 under the regional haze program. This rule may establish a framework for States to include certain control measures or other requirements in their regional haze SIPs where such a program would be "better than BART." A facility must comply with BART as expeditiously as practicable but no later than 5 years after the regional haze SIP is approved. A state may be able to rely on this rule to satisfy the BART requirements for a NESHAP affected source utilizing a wet scrubber if (1) the compliance date for a source subject to this NESHAP falls within the BART compliance timeframe, (2) the proposed controls are more cost effective than the controls that would constitute BART, and (3) the visibility benefits of the controls are at least as effective as BART.

States may also allow sources to "average" emissions across any set of BART-eligible emissions units within a fence-line, provided the emissions reductions from each pollutant being controlled for BART are equal to those reductions that would be obtained by simply controlling each of the BART-eligible units that constitute the BART-eligible source (40 CFR 51.308(e)(2)). This averaging technique may also be advantageous to cement facilities subject to this NESHAP that also have BART-subject sources.

Under the regional haze rule, States may develop an alternative "better than BART" program in lieu of source-by-source BART. The alternative program must achieve greater reasonable progress than BART would toward the national visibility goal. The alternative program may allow more time for compliance than source-by-source BART would have allowed. Any reductions relied on for a better than BART analysis must be surplus as of the baseline year the State relies on for purposes of developing its regional haze SIP (i.e., 2002) and can include reductions from non-BART and BART sources.[46] Visibility analyses must verify that the alternative program, on average, gets greater visibility improvement than BART and that no

degradation in visibility on the best days occurs (40 CFR 51.308(e)(3)).

EPA believes that emissions units at cement sources found to be subject to BART and that will be required to install controls or otherwise achieve emissions reductions per the regional haze regulations can benefit from this Cement NESHAP to potentially satisfy the regional haze requirements. EPA will need to demonstrate that the implementation of the cement NESHAP will result in SO_2 emissions reductions and related visibility improvements that are greater than reductions achieved through the application of BART controls. If EPA demonstrates that the SO_2 emissions reductions and visibility and air quality improvements resulting from the rule are better than BART, this demonstration, when incorporated into the Regional Haze SIP, may be anticipated to fulfill federal regulatory requirements associated with SO_2 BART requirements for cement facilities.

Additionally, the level of control achieved through the Cement NESHAP may contribute toward, and possibly achieve, the visibility improvements needed to satisfy the reasonable progress requirements of the regional haze rule for cement facilities through the first Regional Haze planning period. States can submit the relevant regional haze SIP amendments once this rule becomes final.

Health Benefits of Reducing Emissions From Portland Cement Kilns

Implementation of the Cement NESHAP, which could lead to substantial reductions in $PM_{2.5}$, SO_2, and toxic air pollutants, could reduce numerous health effects.

Section VI.G of this preamble provides a summary of the monetized human health benefits of this proposed regulation based on the Regulatory Impact Analysis available in this docket that includes more detail regarding the costs and benefits of this proposed regulation.

As mentioned before, Portland cement kilns emit several criteria pollutants with known human health effects, including $PM_{2.5}$, SO_2, NO_X, and precursors to ozone. Exposure to $PM_{2.5}$ is associated with significant respiratory and cardiac health effects, such as premature mortality, chronic bronchitis, nonfatal heart attacks, hospital admissions, emergency department visits, asthma attacks, and work loss days.[47] Exposure to SO_2 and NO_X is associated with increased respiratory effects, including asthma attacks,

hospital admissions, and emergency department visits. Exposure to ozone is associated with significant respiratory health effects, such as premature mortality, hospital admissions, emergency department visits, acute respiratory symptoms, school loss days.

In addition, Portland cement kilns emit toxic air pollutants, including mercury and HCl. Potential exposure routes to mercury emissions include both inhalation and subsequent ingestion through the consumption of fish containing methylmercury. Mercury in the air eventually settles into water or onto land where it can be washed into water. Once deposited, certain microorganisms can change it into methylmercury, a highly toxic form that builds up in fish, shellfish and animals that eat fish. Fish and shellfish are the main sources of methylmercury exposure to humans. Methylmercury builds up more in some types of fish and shellfish than others. The levels of methylmercury in fish and shellfish depend on what they eat, how long they live and how high they are in the food chain. Mercury exposure at high levels can harm the brain, heart, kidneys, lungs, and immune system of people of all ages. Research shows that most people's fish consumption does not cause a health concern. However, it has been demonstrated that high levels of methylmercury in the bloodstream of unborn babies and young children may harm the developing nervous system, making the child less able to think and learn.[48] HCl is an upper respiratory irritant at relatively low concentrations and may cause damage to the lower respiratory tract at higher concentrations.[49]

I. Other Changes and Areas Where We are Requesting Comment

Startup, Shutdown and Malfunction

The cement kiln source category is presently exempt from compliance with the generally applicable section 112 standards during periods of startup, shutdown and malfunction. *See* Table 1 to subpart LLL of Part 63, which cross-references the exemption found in the General Provisions (*see, e.g.,* 40 CFR 63.6(f)(1) (exemption from non-opacity emission standards) and (h)(1) (exemption from opacity and visible emission standards)). With respect to those exemptions, we note that on December 19, 2008, in a decision addressing a challenge to the 2002, 2004, and 2006 amendments to those

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[46] November 18, 2002 memo from EPA's Office of Air Quality Planning and Standards entitled "2002 Base Year Emission Inventory SIP Planning: 8-hr Ozone, $PM_{2.5}$, and Regional Haze Programs."

[47] USEPA, Air Quality Criteria for Particulate matter, chapter 9.2 (October 2004).

[48] For more information *see http://www.epa.gov/mercury/about.htm*.

[49] For more information *see http://www.epa.gov/oppt/aegl/pubs/tsd52.pdf*.

provisions, the Court of Appeals for the District of Columbia Circuit vacated the SSM exemption. *Sierra Club* v. *EPA,* 551 F. 3d 1019 (D.C. Cir. 2008). Industry petitioners have filed petitions for re-hearing, asking the Court to re-consider its decision. The Court has not yet acted on these petitions.

EPA recognizes that there are different modes of operation for any stationary source, and those modes generally include start-up, normal operations and shut-down. EPA also recognizes that malfunctions may occur. EPA further recognizes that the Clean Air Act does not require EPA to set a single emission standard under section 112(d) that applies during all operating periods. *See Sierra Club* v. *EPA,* 551 F. 3d at 1027. In light of this decision, EPA is proposing not to apply the SSM exemption to the emission standards proposed in this rule. Rather, EPA is proposing that the proposed standards described above apply during both normal operations and periods of startup, shut-down, and malfunction. For the same reason, EPA is further proposing that the SSM exemption not apply to the other section 112 standard applicable to cement kilns, for dioxins (*see* sections 63.1343(b)(3) and (c)(3)), which standard is not otherwise addressed or reopened in this proposed rule.

We base this proposal on the emissions information available to us at this time. *See* CAA 112(d)(3)(A) (standards are based on the average emission limitation achieved by the best performing 12 percent of sources ''for which the Administrator has emissions information''). Specifically, our emissions database has no data showing that emissions during periods of startup, shut-down, and malfunction are different than during normal operation.

We believe that startup and shutdown are both somewhat controlled operating modes for cement kilns (although occurring over different time periods) so that emissions during these operating modes may not be significantly different from those during normal operation. However, we recognize that shutdowns can vary (planned or emergency) and that startups can occur from a cold or a hot kiln, but we currently lack data on HAP emissions that occur during these modes of operation. We further recognize that malfunction conditions are largely unanticipated occurrences for which control strategies are mainly reactive.

EPA requests comment on the proposed approach to addressing emissions during start-up, shutdown and malfunction and the proposed standards that would apply during these periods. EPA specifically requests that commenters provide data and any supporting documentation addressing emissions during start-up, shut-down and malfunctions. If based on the data and information received in response to comments, EPA were to set different standards for periods of start-up, shutdown or malfunction, EPA asks for comment on the level of specificity needed to define these periods to assure clarity regarding when standards for those periods apply.

Data used to set existing source floors. The emissions standards included in the proposed rule were calculated using the emissions information available to the Administrator, in accordance with EPA's interpretation of the requirements of section 112(d)(3) of the Act. In developing this proposed rule, we specifically sought data from as many kilns as possible, given the time constraints when we began our data collection process. Given that there are 152 kilns in this source category, the 12 percent representing the best performing kilns would be 19 kilns. However, in some cases we have emission data from as few as 12 cement kilns, which means that existing source floors were proposed using as few as 2 kilns (although we are soliciting comment on an alternative interpretation that would allow EPA to base floors on a minimum of five sources' performance in all instances where those data exist). EPA expects that more emissions information from other kilns, both with and without similar process and control characteristics, would lead to a better characterization of emissions from the entire population of cement kilns, as well as a better description of intra-source, inter-source, and test method variability, and that statistical techniques can be employed to provide the expected distribution of emissions for the cement kiln population. EPA thus requests commenters to provide additional emissions information on cement kilns' performance.

HCl Test Data and Methods. In some instances, the emissions standards included in the proposed rule were calculated using emissions information provided to EPA that appears to be below detection levels established more than 15 years ago. More specifically, Method 321 as it currently exists identifies a practical lower quantification range for hydrogen chloride from 1000 to 5000 parts per billion for a specific path length and test conditions. Many of the best performing sources with respect to HCl emissions report both values and detection levels below 1000 parts per billion. It is not surprising that detection levels should decrease as improvements in analytical methods occur over time, and EPA is proposing to revise the detection limits in Method 321 to reflect these improvements. While EPA believes lower detection levels are achievable, EPA did not receive the emissions information and other data necessary to assess independently the detection levels, some as low as 20 parts per billion, achieved and reported by sources.

Without additional data or detection limit calculations, EPA could maintain the old detection limit, accept the source-provided limit, or modify the source-provided limit to an expected new acceptable level. Selection of an appropriate detection limit is no trivial matter, as the detection limit could impact how the available data would be used in average emissions calculations. EPA could choose not to use any data below the detection limit in calculations. EPA could also choose to set all data below the detection limit at a value corresponding to one-half the detection limit for average calculation purposes, reasoning that any amount of emissions between zero and the detection limit could occur when the detection limit is recorded. Indeed, this approach, setting all data below the detection limit at a value corresponding to one-half the detection limit, was chosen by the sources that provided emissions information to EPA. EPA could also set all data below the detection limit at a value corresponding to the detection limit, or to zero, for average calculation purposes. Finally, EPA could apply statistical techniques to available emissions information both above and below the detection limit to provide the expected distribution of HCl emissions for the cement kiln population. A further issue, with any of these possible approaches, would be to assess sources' operating variability.

EPA based the HCl emissions limitations contained in the proposal using the source-provided detection limits and setting all data below the detection limit at a value corresponding to the detection limit for average calculation purposes. Should EPA receive additional emissions information sufficient to calculate detection limits from already-received data or emissions information including detection limit calculations from other sources, EPA would be able to ascertain and revise, if necessary, the new detection limits and to calculate a different HCl standard.

EPA requests additional HCl emissions information, including such information as needed to calculate detection limits, as well as detection

limit calculations. Moreover, EPA requests comments on which way, if any, to set the emission detection limit and to handle emissions information below the detection limit for use in this rule. For those commenters who believe EPA's proposed emission detection limit may not be suitable, EPA requests commenters to provide their views of acceptable detection limits and processes to calculate averages from data that are below the detection limit, as well as examples of sample calculations using those processes. We are also requesting comment on the same issues relating to the use of a CEMS meeting the requirements of PS–15 to measure HCl emissions.

Potential Regulation of Open Clinker Piles

In the current rule, we regulate enclosed clinker storage facilities, but not open clinker piles. We are aware of two facilities where a facility has stored clinker in open piles, and fugitive emissions from those piles have reportedly resulted in measurable emissions of hexavalent chromium.[50] However, we do not have information to evaluate the extent of emission potential from unenclosed clinker storage facilities. We are requesting comment and information as to how common the practice of open clinker storage is, appropriate ways to detect or measure fugitive emissions (ranging from open-path techniques to continuous digital or intermittent manual visible emissions techniques), any measurements of emissions of hexavalent chromium (or other HAP) from these open storage piles, potential controls to reduce emissions, or any other factors we should consider. Based on comments received, we may (or may not) take action to regulate these open piles in the final action on this rulemaking.

Submission of Emissions Test Results to EPA. Compliance test data are necessary for many purposes including compliance determinations, development of emission factors, and determining annual emission rates. EPA has found it burdensome and time consuming to collect emission test data because of varied locations for data storage and varied data storage methods.

One improvement that has occurred in recent years is the availability of stack test reports in electronic format as a replacement for bulky paper copies.

In this action, we are taking a step to improve data accessibility for stack tests (and in the future continuous monitoring data). Portland cement sources will have the option of submitting to WebFIRE (an EPA electronic data base), an electronic copy of stack test reports as well as process data. Data entry requires only access to the Internet and is expected to be completed by the stack testing company as part of the work that it is contracted to perform. This option would become available as of December 31, 2011.

Please note that the proposed option to submit source test data electronically to EPA would not require any additional performance testing. In addition, when a facility elects to submit performance test data to WebFIRE, there would be no additional requirements for data compilation; instead, we believe industry would greatly benefit from improved emissions factors, fewer information requests, and better regulation development as discussed below. Because the information that would be reported is already required in the existing test methods and is necessary to evaluate the conformance to the test methods, facilities would already be collecting and compiling these data. One major advantage of electing to submit source test data through the Electronic Reporting Tool (ERT), which was developed with input from stack testing companies (who already collect and compile performance test data electronically), is that it would provide a standardized method to compile and store all the documentation required by this proposed rule. Another important benefit of submitting these data to EPA at the time the source test is conducted is that these data will substantially reduce the effort involved in data collection activities in the future. This results in a reduced burden on both affected facilities (in terms of reduced manpower to respond to data collection requests) and EPA (in terms of preparing and distributing data collection requests). Finally, another benefit of electing to submit these data to WebFIRE electronically is that these data will greatly improve the overall quality of the existing and new emissions factors by supplementing the pool of emissions test data upon which emissions factors are based and by ensuring that data are more representative of current industry operational procedures. A common complaint we hear from industry and regulators is that emissions factors are out-dated or not representative of a particular source category. Receiving

recent performance test results would ensure that emissions factors are updated and more accurate. In summary, receiving these test data already collected for other purposes and using them in the emissions factors development program will save industry, State/local/tribal agencies, and EPA time and money.

As mentioned earlier, the electronic data base that will be used is EPA's WebFIRE, which is a Web site accessible through EPA's technology transfer network (TTN). The WebFIRE website was constructed to store emissions test data for use in developing emission factors. A description of the WebFIRE data base can be found at *http:// cfpub.epa.gov/oarweb/ index.cfm?action=fire.main.* The ERT will be able to transmit the electronic report through EPA's Central Data Exchange (CDX) network for storage in the WebFIRE data base. Although ERT is not the only electronic interface that can be used to submit source test data to the CDX for entry into WebFIRE, it makes submittal of data very straightforward and easy. A description of the ERT can be found at *http:// www.epa.gov/ttn/chief/ert/ert_tool.html.* The ERT can be used to document the conduct of stack tests data for various pollutants including PM, mercury, and HCl. Presently, the ERT does not handle dioxin/furan stack test data, but the tool is being upgraded to handle dioxin/ furan stack test data. The ERT does not currently accept opacity data or CEMS data.

EPA specifically requests comment on the utility of this electronic reporting option and the burden that owners and operators of portland cement facilities estimate would be associated with this option.

Definition of affected source. In the final amendments published on December 20, 2006, we indicated that we were changing paragraph (c) in § 63.1340 to clarify that crushers were part of the affected source for this rule (71 FR 76532). However, we omitted the rule language changes to that paragraph. This language has been added to this proposed rule.

V. Comments on Notice of Reconsideration and EPA Final Action in Response To Remand

As previously noted, EPA received comments on the notice of reconsideration and the final action taken in December 2006. A summary of

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[50] Information on the study of hexavalent chromium emissions believed to result from clinker piles and the rules adopted by the South Coast Air Quality Management District may be found at *http://www.aqmd.gov/RiversideCement/ RiversideCement.html.*

these comments is available in the docket for this rulemaking.[51]

We are not responding to these comments in this proposed action. We will provide responses to these comments, and other comments received on these proposed amendments, when we take final action on this proposal.

VI. Summary of Cost, Environmental, Energy, and Economic Impacts of Proposed Amendments

A. What are the affected sources?

There are currently 93 portland cement manufacturing facilities located in the U.S. and Puerto Rico that we expect to be affected by these proposed amendments. In 2005, these facilities operated 163 cement kilns and associated clinker coolers. We have no estimate of the number of raw material dryers that are separate from the kilns.

Based on capacity expansion data provided by the Portland Cement Association, we anticipate that 20 new kilns and associated clinker coolers will be built in the five years after the promulgation of final standards representing 24 million tpy of clinker capacity. Some of these new kilns will be built at existing facilities and some at new greenfield facilities. The location of the kiln (greenfield or currently existing facility) has no bearing on our estimated cost and environmental impacts. We based new kiln impacts on a 1.2 million tpy clinker kiln. This kiln is the smallest size anticipated for new kilns based on kilns built in the last five years or currently under construction. Using the smallest anticipated kiln size provides a conservative estimate of costs because control costs per unit of capacity tend to be higher for smaller kilns.

B. How are the impacts for this proposal evaluated?

For these proposed Portland Cement NESHAP amendments, the EPA utilized three models to evaluate the impacts of the regulation on the industry and the economy. Typically in a regulatory analysis, EPA determines the regulatory options suitable to meet statutory obligations under the CAA. Based on the stringency of those options, EPA then determines the control technologies and monitoring requirements that may be selected to comply with the regulation. This is conducted in an Engineering Analysis. The selected control technologies and monitoring requirements are then

evaluated in a cost model to determine the total annualized control costs. The annualized control costs serve as inputs to an Economic Impact Analysis model that evaluates the impacts of those costs on the industry and society as a whole.

The Economic Impact Analysis model uses a single-period static partial-equilibrium model to compare a pre-policy cement market baseline with expected post-policy outcomes in cement markets. This model was used in previous EPA analyses of the portland cement industry (EPA, 1998; EPA, 1999b). The benchmark time horizon for the analysis is assumed to be short and producers have some constraints on their flexibility to adjust factors of production. This time horizon allows us to capture important transitory impacts of the program on existing producers. The model uses traditional engineering costs analysis as ''exogenous'' inputs (i.e., determined outside of the economic model) and computes the associated economic impacts of the proposed regulation.

For the Portland Cement NESHAP, EPA also employs the Industrial Sector Integrated Solutions (ISIS) model which conducts both the engineering cost analysis and the economic analysis in a single modeling system. The ISIS model is a dynamic and integrated model that simulates potential decisions made in the cement industry to meet an environmental policy under a regulatory scenario. ISIS simultaneously estimates (1) optimal industry operation to meet the demand and emission reduction requirements, (2) the suite of control technologies needed to meet the emission limit, (3) the engineering cost of controls, and (4) economic impacts of demand response of the policy, in an iterative loop until the system achieves the optimal solution. The peer review of the ISIS model can be found in the docket.[52] This model will be revised based on peer review comments and comments on this proposed rule and will be used to develop the cost and economic impacts of the final rule.

In a Technical Memo to the docket, we provide a comparison of these models to provide an evaluation of how the differences between the models may impact the resulting estimates of the impacts of the regulation. For example, the Engineering Analysis and Economic Impact Analysis evaluate a snapshot of implementation of the proposed rule in a given year (i.e., 2018, based on 2005 dollars) while ISIS evaluates impacts of compliance dynamically over time (i.e.,

2013–2018). In general, given the optimization nature of ISIS, ISIS accounts for more flexibility when estimating the impacts of the regulation. For example, when optimizing to meet an emission limit, ISIS allows for the addition of new kilns, as well as kiln retirements, replacements, and expansions and the installation of controls. In the Engineering Analysis the existing kiln population is assumed to be constant even though normal kiln retirements occur. Overall, we anticipate the total control costs from the Engineering Analysis to be higher than that of ISIS. With higher cost estimates serving as the basis for the Economic Impact Analysis along with other modeling differences, we expect the results presented from the EIA model will be higher in impact than those presented by ISIS.

In addition, we have not yet developed ISIS modules to calculate non-air environmental impacts and energy impacts. Therefore, these sections only contain impacts calculated by the traditional engineering methods

C. What are the air quality impacts?

For the proposed Portland Cement NESHAP, EPA estimated the emission reductions that would occur due to the implementation of the proposed emission limits. EPA estimated emission reductions based on the control technologies selected by the engineering analysis. These emission reductions are based on 2005 emission baselines.

Under the proposed limit for mercury, we have estimated that the emissions reductions would be 13,800 lb/yr for existing kilns. Based on our 1.2 million tpy model kiln, mercury emissions would be reduced by 120 lb/yr for each new kiln, or about 2,400 lb/yr 5 years after promulgation of the final standards.

Under the proposed limits for THC, we have estimated that the emissions reductions would be 13,000 tpy for existing kilns, which represent an organic HAP reduction of 3,100 tpy. For new kilns, THC emissions would be reduced by 50 tpy per kiln or about 920 tpy 5 years after promulgation of the final standard. This represents an organic HAP reduction of 192 tpy.

Under the proposed limit for HCl, we have estimated that emissions would be reduced by 2,700 tpy for existing kilns. Emissions of HCl from new kilns would be 45 tpy per kiln or 900 tpy 5 years after promulgation of the final standards.

The proposed emission limits for PM represent a lowering of the PM limit from 0.5 lb/ton of clinker to 0.085 lb/ton

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[51] Summary of Comments on December 20, 2006 Final Rule and Notice of Reconsideration. April 15, 2009.

[52] *See* Industrial Sector Integrated Solutions Model dated December 23, 2008 and Review of ISIS Documentation Package dated April 15, 2009.

of clinker for existing kilns and for new kilns, a lowering to 0.080 lb/ton of clinker. We have estimated that PM emissions would be reduced by 10,600 tpy for existing kilns. For new kilns, emission reductions would be 150 tpy per kiln, or about 3,100 tpy 5 years after promulgation of the final standards.

The proposed standards for mercury, THC and HCl will also result in concurrent control of SO_2 emissions. For kilns that use an RTO to comply with the THC emissions limit it is necessary to install an alkaline scrubber upstream of the RTO to control acid gas and to provide additional control of PM and to avoid plugging and fouling of the RTO. Scrubbers will also be used to control HCl and mercury emissions. Reductions in SO_2 emissions associated with controls for mercury, THC and HCl are estimated at 1,600 tpy, 7,300 tpy, and 107,000 tpy, respectively. Total reduction in SO_2 emissions from existing kilns would be an estimated 116,000 tpy. A new 1.2 million tpy kiln equipped with a scrubber will reduce SO_2 emissions by 1,000 tpy on average or about 20,000 tpy in the fifth year after promulgation of the final standards.

These controls will also reduce emissions of secondary $PM_{2.5}$ (and coarse PM ($PM_{10-2.5}$) as well). This is PM that results from atmospheric transformation processes of precursor gases, including SO_2.

In addition to this traditional estimation of emission reductions, EPA employed the ISIS model to estimate emission reductions. The estimation of emission reductions in the ISIS model accounts for the optimization of the industry and includes the addition of new kilns, kiln retirements, replacements, and expansions as well as installation of controls. Using the ISIS model, in 2013 we estimate reductions of 11,400 lbs of mercury, 11,670 tons of THC, 2,780 tons of HCl, 10,530 tons of PM and 160,000 tons of SO_2 compared to total emissions in 2005. More information on the ISIS model and results can be found in the ISIS TSD and in a Technical Memo to the docket.

D. What are the water quality impacts?

We estimated no water quality impacts for the proposed amendments. The requirements that might result in the use of alkaline scrubbers will produce a scrubber slurry liquid waste stream. However, we assume the scrubber slurry produced will be dewatered and added back into the cement-making process as gypsum. Water from the dewatering process will be recycled back to the scrubber. The four facilities that currently use wet scrubbers in this industry report no

water releases at any time. However, the use of scrubbers could create potential for water release due to system purges. We are requesting comment and data on water quality impacts, on what, if any, regulations might apply, and if we should add any requirements to this rule to prevent or control these purges. The addition of scrubbers will increase water usage by about 2,700 million gallons per year. For a new 1.2 million tpy kiln, water usage will be 36 million gallons per year or 720 million gallons per year 5 years after promulgation of the final standards.

We note that some preproposal commenters have stated that some new and existing facilities may be located in areas where there is not sufficient water to operate a wet scrubber. However, we are not mandating the use of wet scrubber technology in these regulations, and we believe that sufficient alternative controls exist for mercury and acid gas controls that this issue would not preclude a facility from meeting these proposed emissions limits. However, we are also soliciting comment on this issue.

E. What are the solid waste impacts?

The potential for solid waste impacts are associated with greater PM control for kilns, waste generated by ACI systems and solids resulting from solids in scrubber slurry water. As explained above, we have assumed little or no solid waste is expected from the generation of scrubber slurry because the solids from the slurry are used in the finish mill as a raw material. The PM captured in the kiln fabric filter (cement kiln dust) is essentially recaptured raw material, intermediate materials, or product. Based on the available information, it appears that most captured PM is typically recycled back to the kilns to the maximum extent possible. Therefore we estimate that any additional PM captured would also be recycled to the kiln to the extent possible.

Where equipped with an alkali bypass, the bypass will have a separate PM control device and that PM is typically disposed of as solid waste. An alkali bypass is not required on all kilns. Where one is present, the amount of solid waste generated from the alkali bypass is minimal, usually about 1 percent of total CKD in control devices, because the bypass gas stream is a small percentage of total kiln exhaust gas flow and the bypass gas stream does not contact the feed stream in the raw mill.

Waste collected in the polishing baghouse associated with ACI that might be added for mercury or THC control cannot be recycled to the kiln

and would be disposed of as solid waste. An estimated 120,000 tpy of solid waste would be generated from the use of ACI systems on existing kilns. Each new kiln equipped with an ACI system would be expected to generate 1,800 tons of solid waste per kiln or, assuming 14 of the 20 new kilns would add ACI systems, about 25,000 tpy in the fifth year after promulgation of the final standards.

In addition to the solid waste impacts described above, there is a potential for an increase in solid waste if a facility elects to control mercury emission by increasing the amount of CKD wasted rather than returned to process. This will be a site-specific decision, and we have no data to estimate the potential solid waste that may be generated by this practice. However, we expect the total amount to be small for two reasons. First, wasting cement kiln dust for mercury control represents a significant expense to a facility because it would be essentially wasting either raw materials or product. So we anticipate this option will not be used if the amount of CKD wasted would be large. Second, we believe that cement manufacturers will add the additional CKD to the finish mill to the maximum extent possible rather than waste the material.

We are requesting comment on the potential for increases in solid waste generation, on what, if any regulations might apply, and if we should add any requirements to this rule to prevent or control the potential additional solid waste requirements.

F. What are the secondary impacts?

Indirect or secondary air quality impacts include impacts that would result from the increased electricity usage associated with the operation of control devices as well as water quality and solid waste impacts (which were just discussed) that would occur as a result of these proposed revisions. We estimate these proposed revisions would increase emissions of criteria pollutants from utility boilers that supply electricity to the portland cement facilities. We estimate increased energy demand associated with the installation of scrubbers, ACI systems, and RTO. The increases for existing kilns are estimated to be 1,600 tpy of NO_X, 800 tpy of CO, 2,700 tpy of SO_2 and about 80 tpy of PM. For new kilns (assuming that of the 20 new kilns to start up in the 5 years following promulgation of the final standard 20 will add alkaline scrubbers, 2 will add an RTO, 14 will install ACI systems, and 20 will install membrane bags instead of cloth bags in their baghouses), increases in secondary air pollutants are

estimated to be 410 tpy of NO_X, 210 tpy of CO, 690 tpy of SO_2 and 20 tpy of PM. We also estimated increases of CO_2 to be 775,000 tpy (existing kilns) and 200,000 tpy (new kilns).

G. What are the energy impacts?

The addition of alkaline scrubbers, ACI systems, and RTO added to comply with the proposed amendments will result in increased energy use due to the electrical requirements for the scrubber and ACI systems and increased fan pressure drops, and natural gas to fuel the RTO. We estimate the additional national electrical demand to be 705 million kWhr per year and the natural gas use to be 600,000 MMBtu per year for existing kilns. For new kilns, assuming of the 20 new kilns to start up in the 5 years following promulgation of the final standard that 20 will add alkaline scrubbers, 2 will add an RTO, and 14 will install ACI systems, the electrical demand is estimated to be 180 million kWhr per year and the natural gas use to be 160,000 MMBtu per year.

H. What are the cost impacts?

Under the proposed amendments, existing kilns are expected to add one or more control devices to comply with the proposed emission limits. In addition, each kiln would be required to install CEMS to monitor mercury, THC and HCl while bag leak detectors (BLDs) would be required to monitor performance of all baghouses.

We performed two separate cost analyses for this proposed rule. In the engineering cost analysis, we estimated the cost of the proposed amendments based on the type of control device that was assumed to be necessary to comply with the proposed emission standards. Based on baseline emissions of mercury, THC, HCl and PM for each kiln and the removal efficiency necessary to comply with the proposed emission limit for each HAP, an appropriate control device was identified. In assigning control devices to each kiln where more than one control device would be capable of reducing emissions of a particular HAP below the limit, we assumed that the least costly control would be installed. For example, if a kiln could use either a scrubber or ACI to comply with the proposed limit for mercury, it was assumed that ACI would be selected over a scrubber because an ACI system would be less costly. ACI also is expected to achieve a higher removal efficiency than a scrubber for mercury. In some instances, a more expensive technology was considered appropriate because the selected control reduced emissions of multiple pollutants. For example, even though ACI would be less costly than a scrubber for controlling mercury, if the kiln also had to reduce HCl emissions, we assumed that a scrubber would be applied to control HCl as well as mercury because ACI would not control HCl. However, for many kilns, our analysis assumes that multiple controls will have to be added because more than one control will be needed to control all HAP. For example, ACI may be considered necessary to meet the limits for THC and/or mercury. For the same kiln, a scrubber would also be required to reduce HCl emissions. In this case we would allocate the cost of the control to controlling HCl emissions, not to the cost of controlling mercury emissions. In addition, once we assigned a particular control device, in most cases we assumed mercury and THC emissions reductions would equal the control device efficiency, and not the minimum reduction necessary to meet the emissions limit. We believe this assumption is warranted because it matches costs with actual emissions reductions. In the case of PM and HCl, we assumed the controlled facility would emit at the average level necessary to meet the standard (i.e., we assumed for PM that the controlled facility would emit at 0.01 lb/ton clinker, the average emission level, not 0.085 lb/ton clinker, the actual emissions limit), because the proposed emissions levels are extremely low.

In a separate analysis performed using the ISIS model, we input into ISIS the baseline and controlled emissions rates for each pollutant, along with the maximum percent reduction achievable for a particular control technology, and allowed ISIS to base the control required on optimizing total production costs. In addition, the ISIS model accounts for normal kiln retirements that would occur even in the absence of any regulatory action (i.e., as new kilns come on-line, older, less efficient and more costly to operate kilns are retired). In the first cost analysis, total national annual costs assume that all kilns currently operating continue to operate while 20 new kilns come on-line.

Table 8 presents the resulting add-on controls each approach estimated was necessary to meet the proposed emissions limits.

TABLE 8—CONTROL INSTALLATION COMPARISON

	LSW	ACI	LWS+ACI	RTO	MB	FF	WS+RTO
Engineering Analysis	5	36	111	0	35	5	12
ISIS Model	7	34	107	10	17	0	11

In the engineering analysis we estimated the total capital cost of installing alkaline scrubbers and ACI systems for mercury control, including monitoring systems, would be $72 million with an annualized cost of $28 million. The estimated capital cost of installing ACI systems and RTO/scrubbers to reduce THC emissions would be $322 million with annualized cost of $103 million. The capital cost of adding scrubbers for the control of HCl is estimated to be $692 million with an annualized cost of $109 million. The capital cost of adding membrane bags to existing baghouse and the replacement of ESP's with baghouses would be $54 million with annualized cost of $17 million. The total capital cost for the proposed amendments would be an estimated $1.14 billion with an annualized cost of $256 million.

The estimated emission control capital cost per new 1.2 million tpy kiln is $17.6 million and the annualized costs are estimated at $1.25 million for mercury control, $1.3 million for THC control, $1.8 million for HCl control and $270,000 for PM control. National annualized cost by the end of the fifth year will be an estimated $92.4 million.

In the ISIS results, we are not able to separate costs by pollutant because the model does an overall optimization of the production and air pollution control costs. The total annual costs of the ISIS model are $222 million in 2013. These impacts assume that in 2013 nine new kilns are installed and net four kilns are retired. These retirements include two kilns that we have determined may close due to not being able to meet the mercury emission limits due to unusually high mercury contents in their proprietary quarries (i.e., the mercury content of the raw material at limestone quarries).

I. What are the economic impacts?

EPA employed both a partial-equilibrium economic model and the

ISIS model to analyze the impact on the industry and the economy.

The Economic Impact Analysis model estimates the average national price for portland cement could be 4 percent higher with the NESHAP, or $3.30 per metric ton, while annual domestic production may fall by 8 percent, or 7 million tons per year. Because of higher domestic prices, imports are expected to rise by 2 million metric tons per year.

As domestic production falls, cement industry revenues are projected to decline by 4 percent, or $340 million. Overall, net production costs also fall by $140 million with compliance cost increases ($240 million) offset by cost reductions associated with lower cement production. Operating profits fall by $200 million, or 16 percent. Other projected impacts include reduced demand for labor. Employment falls by approximately 8 percent, or 1,200 employees. EPA identified six domestic plants with negative operating profits and significant utilization changes that could temporarily idle until market demand conditions improve. The plants are small capacity plants with unit compliance costs close to $5 per ton and $50 million total change in operating profits. Since these plants account for approximately 2.5 percent of domestic capacity, a decision to permanently shut down these plants would reduce domestic supply and lead to additional projected market price increases.[53]

The estimated domestic social cost of the proposed amendments is $684 million. There is an estimated $89 million surplus gain for other countries producing cement. The social cost estimates are significantly higher than the engineering analysis estimates, which estimated annualized costs of $370 million. This is a direct consequence of EPA's assumptions about existing domestic plants' pricing behavior. Under baseline conditions without regulation, the existing domestic cement plants are assumed to choose a production level that is less than the level produced under perfect competition. The imposition of additional regulatory costs tends to widen the gap between price and marginal cost in these markets and contributes to additional social costs. For more detail see the Regulatory Impact Analysis (RIA).

Using the ISIS model, we estimate cement demand to drop 1.9 percent in 2013 or 2.5 million tons with an average annual drop in demand at 1.5 percent or 2.2 million tons per year during the 2013–2018 time period. The drop in demand will affect the level of imports, and imports are likely to rise slightly over the policy horizon. In 2013, imports rise 1.39 percent or 0.44 million tons with an annual average of 0.39 percent or 0.13 million tons per year throughout 2013–2018. ISIS estimates the average national price for portland cement in the 2013–2018 time period to be 1.2 percent higher with the NESHAP, or $0.96 per metric ton. However, some markets could see an increase by up to 6.7 percent. Total annualized control cost for the proposed NESHAP amendments is projected to be $222 million in 2013.

With respect to the baseline case in 2013, ISIS identified a net retirement of 2.4 million tons of capacity. The retirements affect 4 kilns at 4 facilities. As a result of the proposed NESHAP amendments, the cost to produce a ton of cement (production, imports, transportation and control technology) increases from $56.11 per ton at baseline to $57.47 per ton as a result of these proposed amendments ($1.36/ton), resulting in an increase of about 2.7 percent over the analysis period of 2013 to 2018. With respect to baseline in 2013 ISIS projects the revenue of the cement industry to fall by 1.2 percent or about $91 million. More information on this model can be found in the ISIS TSD and in a Technical Memo to the docket.

J. What are the benefits?

We estimate the monetized co-benefits of this proposed NESHAP to be $4.4 billion to $11 billion (2005$, 3 percent discount rate) in the year of full implementation (2013); using alternate relationships between $PM_{2.5}$ and premature mortality supplied by experts, higher and lower benefits estimates are plausible, but most of the expert-based estimates fall between these two estimates.[54] The benefits at a 7 percent discount rate are $4.0 billion to $9.7 billion (2005$)[55]. A summary of the monetized benefits estimates at discount rates of 3 percent and 7 percent is in Table 9.

TABLE 9—SUMMARY OF THE MONETIZED BENEFITS ESTIMATES FOR THE PROPOSED PORTLAND CEMENT NESHAP

Pollutant	Emission reductions (tons)	Total monetized benefits (millions of 2005 dollars, 3% discount)[1]	Total monetized benefits (millions of 2005 dollars, 7 percent discount)[1]
Direct $PM_{2.5}$	6,300	$1,200 to $2,800	$1,000 to $2,500.
$PM_{2.5}$ precursors	140,000	$3,300 to $8,000	$3,000 to $7,200.
Grand total		$4,400 to $11,000	$4,000 to $9,700.

[1] All estimates are for the analysis year (full implementation, 2013), and are rounded to two significant figures so numbers may not sum across rows. $PM_{2.5}$ precursors reflect emission reductions of SO_X. All fine particles are assumed to have equivalent health effects, and the monetized benefits incorporate the conversion from precursor emissions to ambient fine particles.

These benefits estimates are the monetized human health co-benefits of reducing cases of morbidity and premature mortality among populations exposed to $PM_{2.5}$ from installing controls to limit hazardous air pollutants (HAPs), such as mercury, hydrochloric acid, and hydrocarbons. We generated estimates that represent the total monetized human health benefits (the sum of premature mortality and morbidity) of reducing $PM_{2.5}$ and $PM_{2.5}$ precursor emissions. We base the estimate of human health benefits derived from the $PM_{2.5}$ and $PM_{2.5}$ precursor emission reductions on the approach and methodology laid out in the TSD that accompanied the RIA for

[53] In addition to the six plants identified that could temporarily idle or permanently shut down, there are two plants that are at risk of closure because they may not be able to meet the existing source mercury emissions limit, even if they apply the best controls. We did not assume they would close in this analysis because there may be site-specific mercury control alternative that would allow them to remain open.

[54] Roman *et al.,* 2008. Expert Judgment Assessment of the Mortality Impact of Changes in Ambient Fine Particulate Matter in the U.S. Environ. Sci. Technol., 42, 7, 2268–2274.

[55] Using alternate emission reductions generated by the ISIS model, the benefits results are similar to those shown here. Although the ISIS model estimates different emission reductions, the increased SO_2 reductions offset the fewer $PM_{2.5}$ reductions. More information on the health benefits estimated for the ISIS results can be found in the ISIS TSD.

the revision to the National Ambient Air Quality Standard for Ground-level Ozone (NAAQS), March 2008 with three changes explained below.

For context, it is important to note that in quantifying PM benefits the magnitude of the results is largely driven by the concentration response function for premature mortality. Experts have advised EPA to consider a variety of assumptions, including estimates based both on empirical (epidemiological) studies and judgments elicited from scientific experts, to characterize the uncertainty in the relationship between $PM_{2.5}$ concentrations and premature mortality. For this proposed NESHAP we cite two key empirical studies, one based on the American Cancer Society cohort study [56] and the extended Six Cities cohort study.[57] Alternate models identified by experts describing the relationship between $PM_{2.5}$ and premature mortality would yield higher and lower estimates depending upon the assumptions that they made, but most of the expert-based estimates fall between the two epidemiology-based estimates (Roman *et al.* 2008).

EPA strives to use the best available science to support our benefits analyses. We recognize that interpretation of the science regarding air pollution and health is dynamic and evolving. One of the key differences between the method used in this analysis of PM-cobenefits and the methods used in recent RIAs is that, in addition to technical updates, we removed the assumption regarding thresholds in the health impact function. Based on our review of the body of scientific literature, we prefer the no-threshold model. EPA's draft Integrated Science Assessment (2008), which is currently being reviewed by EPA's Clean Air Scientific Advisory Committee, concluded that the scientific literature consistently finds that a no-threshold log-linear model most adequately portrays the PM-mortality concentration-response relationship while recognizing potential uncertainty about the exact shape of the concentration-response function. It is important to note that while CASAC provides advice regarding the science associated with setting the National Ambient Air Quality Standards, typically other scientific advisory

bodies provide specific advice regarding benefits analysis.

Using the threshold model at 10 μg/m³ without the two technical updates, we estimate the monetized benefits to be $3.1 billion to $6.5 billion (2005$, 3 percent discount rate) and $2.8 billion to $5.9 billion (2005$, 7 percent discount rate) in the year of full implementation. Approximately 75 percent of the difference between the old methodology and the new methodology for this rule is due to removing thresholds with 25 percent due to the two technical updates, but this percentage would vary depending on the combination of emission reductions from different sources and $PM_{2.5}$ precursor pollutants. For more information on the updates to the benefit-per-ton estimates, please refer to the RIA for this proposed rule that is available in the docket.

The question of whether or not to assume a threshold in calculating the co-benefits associated with reductions in $PM_{2.5}$ is an issue that affects the benefits calculations not only for this rule but for many future EPA rulemakings and analyses. Due to these implications, we solicit comment on appropriateness of both the no-threshold and threshold model for PM benefits analysis.

To generate the benefit-per-ton estimates, we used a model to convert emissions of direct $PM_{2.5}$ and $PM_{2.5}$ precursors into changes in $PM_{2.5}$ air quality and another model to estimate the changes in human health based on that change in air quality. Finally, the monetized health benefits were divided by the emission reductions to create the benefit-per-ton estimates. Even though all fine particles are assumed to have equivalent health effects, the benefit-per-ton estimates vary between precursors because each ton of precursor reduced has a different propensity to form $PM_{2.5}$. For example, SO_X has a lower benefit-per-ton estimate than direct $PM_{2.5}$ because it does not form as much $PM_{2.5}$, thus the exposure would be lower, and the monetized health benefits would be lower.

This analysis does not include the type of detailed uncertainty assessment found in the 2006 $PM_{2.5}$ NAAQS RIA because we lack the necessary air quality input and monitoring data to run the benefits model. However, the 2006 $PM_{2.5}$ NAAQS benefits analysis provides an indication of the sensitivity of our results to the use of alternative concentration response functions, including those derived from the PM expert elicitation study.

The social costs of this rulemaking are estimated at $694 million (2005$) in the

year of full implementation, and the benefits are estimated at $4.4 billion to $11 billion (2005$, 3 percent discount rate) for that same year. The benefits at a 7 percent discount rate are $4.0 billion to $9.7 billion (2005$). Thus, net benefits of this rulemaking are estimated at $3.7 billion to $11 billion (2005$, 3 percent discount rate); using alternate relationships between $PM_{2.5}$ and premature mortality supplied by experts, higher and lower benefits estimates are plausible, but most of the expert-based estimates fall between the two estimates we present above. The net benefits at a 7 percent discount rate are $3.3 billion to $9.0 billion (2005$). EPA believes that the benefits are likely to exceed the costs by a significant margin even when taking into account the uncertainties in the cost and benefit estimates.

It should be noted that the benefits estimates provided above do not include benefits from improved visibility, coarse PM emission reductions, or other hazardous air pollutants such as mercury and hydrochloric acid, additional emission reductions that would occur if cement facilities temporarily idle or reduce capacity utilization as a result of this regulation, or the unquantifiable amount of reductions in condensable PM. We do not have sufficient information or modeling available to provide such estimates for this rulemaking.

For more information, please refer to the RIA for this proposed rule that is available in the docket.

VII. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

Under section 3(f)(1) of Executive Order 12866 (58 FR 51735, October 4, 1993), this action is an "economically significant regulatory action" because it is likely to have an annual effect on the economy of $100 million or more.

Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Order 12866, and any changes made in response to OMB recommendations have been documented in the docket for this action.

B. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the OMB under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* The Information Collection Request (ICR) document

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[56] Pope *et al.,* 2002. "Lung Cancer, Cardiopulmonary Mortality, and Long-term Exposure to Fine Particulate Air Pollution." *Journal of the American Medical Association* 287:1132–1141.

[57] Laden *et al.,* 2006. "Reduction in Fine Particulate Air Pollution and Mortality." *American Journal of Respiratory and Critical Care Medicine.* 173: 667–672.

prepared by EPA has been assigned EPA ICR number 1801.07.

In most cases, new and existing kilns and in-line kiln/raw mills at major and area sources that are not already subject to emission limits for THC, mercury, and PM would become subject to the limits and associated compliance provisions in the current rule. New compliance provisions for mercury would remove the current requirement for an initial performance test coupled with monitoring of the carbon injection rate. Instead, plants would measure mercury emissions by calculating a 30-day average from continuous or integrated monitors. Records of all calculations and data would be required. New compliance procedures would also apply to area sources subject to a PM limit in a format of lbs/ton of clinker. The owner or operator would be required to install and operate a weight measurement system and keep daily records of clinker production instead of the current requirement to install and operate a PM CEMS. The owner or operator would be required to conduct an initial PM performance test and repeat performance tests every 5 years. Cement plants also would be subject to new limits for HCl and associated compliance provisions which include compliance tests using EPA Method 321 and continuous monitoring for HCl for facilities that do not use a wet scrubber for HCl control. These requirements are based on the recordkeeping and reporting requirements in the NESHAP General Provisions (40 CFR part 63, subpart A) which are mandatory for all operators subject to national emission standards. These recordkeeping and reporting requirements are specifically authorized by section 114 of the CAA (42 U.S.C. 7414). All information submitted to EPA pursuant to the recordkeeping and reporting requirements for which a claim of confidentiality is made is safeguarded according to EPA policies set forth in 40 CFR part 2, subpart B.

The annual burden for this information collection averaged over the first 3 years of this ICR is estimated to total 44,656 labor-hours per year at a cost of $4.1 million per year. The average annualized capital costs are estimated at $53.7 million per year and average operation and maintenance costs are estimated at $174,000 per year. Burden is defined at 5 CFR 1320.3(b).

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9. To comment on the

Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, EPA has established a public docket for this proposed rule, which includes this ICR, under Docket ID number EPA–HQ–OAR–2002–0051. Submit any comments related to the ICR for this proposed rule to EPA and OMB. *See* **ADDRESSES** section at the beginning of this document for where to submit comments to EPA. Send comments to OMB at the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW., Washington, DC 20503, *Attention:* Desk Office for EPA. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after May 6, 2009, a comment to OMB is best assured of having its full effect if OMB receives it by June 5, 2009. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impact of this rule on small entities, small entity is defined as: (1) A small business whose parent company has no more than 750 employees (as defined by Small Business Administration (SBA) size standards for the portland cement industry, NAICS 327310); (2) a small governmental jurisdiction that is a government of a city, county, town, school district, or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impact of this proposed rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. We estimate that up to 4 of the 44 existing portland cement plants are small entities. One of the entities burns hazardous waste in its kiln and is not impacted by this proposed rule.

EPA performed a screening analysis for impacts on the three affected small entities by comparing compliance costs to entity revenues. EPA's analysis found that the ratio of compliance cost to company revenue for two small entities (including a tribal government) would have an annualized cost of between 1 percent and 3 percent of sales. One small business would have an annualized cost of 4.8 percent of sales. All three affected facilities are projected to continue to operate under with-regulation conditions.

EPA also evaluated small business impacts using the ISIS model. There are a total of 7 kilns identified to be associated with small business facilities affected by this proposal. ISIS identified one of these kilns to retire in 2013 as a result of the proposed NESHAP. A second kiln reduces its utilization by 56 percent in 2013 but recovers later in the 2013 to 2018 time frame as the demand increases. All the remaining small business kilns operate at full capacity throughout the 2013 to 2018 time frame.

Although this proposed rule will not impact a substantial number of small entities, EPA nonetheless has tried to reduce the impact of this proposed rule on small entities by setting the proposed emissions limits at the MACT floor, the least stringent level allowed by law. In the case where there are overlapping standards between this NESHAP and the Portland Cement NSPS, we have exempted sources from the least stringent requirement, thereby eliminating the overlapping monitoring, testing and reporting requirements by proposing that the source comply with only the more stringent of the standards. We continue to be interested in the potential impacts of this proposed rule on small entities and welcome comments on issues related to such impacts.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act (UMRA), 2 U.S.C 1531–1538, requires Federal agencies, unless otherwise prohibited by law, to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Federal agencies must also develop a plan to provide notice to small governments that might be significantly or uniquely affected by any regulatory requirements. The plan must enable officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates and must inform, educate, and advise small governments on compliance with the regulatory requirements.

This rule contains a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. Accordingly, EPA has prepared under section 202 of the UMRA a written statement which is summarized below.

Consistent with the intergovernmental consultation provisions of section 204 of the UMRA, EPA has already initiated consultations with the governmental entities affected by this rule. In developing this rule, EPA consulted with small governments under a plan developed pursuant to section 203 of UMRA concerning the regulatory requirements in the rule that might significantly or uniquely affect small governments. EPA has determined that this proposed action contains regulatory requirements that might significantly or uniquely affect small governments because one of the facilities affected by the proposed rule is tribally owned. EPA consulted with tribal officials early in the process of developing this regulation to permit them to have meaningful and timely input into its development. EPA directly contacted the facility in question to insure it was apprised of this rulemaking and potential implications. This facility indicated it was aware of the rulemaking and was participating in meetings with the industry trade association concerning this rulemaking. The facility did not indicate any specific concern, and we are assuming that they have the same concerns as those expressed by the other non-tribally owned facilities during the development of this proposed rule.

Consistent with section 205, EPA has identified and considered a reasonable number of regulatory alternatives. EPA carefully examined regulatory alternatives, and selected the lowest cost/least burdensome alternative that EPA deems adequate to address Congressional concerns and to effectively reduce emissions of mercury, THC and PM. EPA has considered the costs and benefits of the proposed rule, and has concluded that the costs will fall mainly on the private sector (approximately $273 million). EPA estimates that an additional facility owned by a tribal government will incur approximately $2.1 million in costs per year. Furthermore, we think it is unlikely that State, local and Tribal governments would begin operating large industrial facilities, similar to those affected by this rulemaking operated by the private sector.

E. Executive Order 13132: Federalism

Executive Order 13132 (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

This proposed rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. None of the affected facilities are owned or operated by State governments. Thus, Executive Order 13132 does not apply to this proposed rule.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed action from State and local officials.

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

Subject to the Executive Order 13175 (65 FR 67249, November 9, 2000) EPA may not issue a regulation that has tribal implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by tribal governments, or EPA consults with tribal officials early in the process of developing the proposed regulation and develops a tribal summary impact statement.

EPA has concluded that this action will have tribal implications, because it will impose substantial direct compliance costs on tribal governments, and the Federal government will not provide the funds necessary to pay those costs. One of the facilities affected by this proposed rule is tribally owned. We estimate this facility will incur direct compliance costs that are between 1 to 3 percent of sales. Accordingly, EPA provides the following tribal summary impact statement as required by section 5(b).

EPA consulted with tribal officials early in the process of developing this regulation to permit them to have meaningful and timely input into its development. EPA directly contacted the facility in question to insure it was apprised of this rulemaking and potential implications. This facility indicated that it was aware of the rulemaking and was participating in meetings with the industry trade association concerning this rulemaking. The facility did not indicate any specific concern, and we are assuming that they have the same concerns as those expressed by the other non-tribally owned facilities during the development of this proposed rule.

EPA specifically solicits additional comments on this proposed action from tribal officials.

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

EPA interprets Executive Order 13045 as applying to those regulatory actions that concern health or safety risks, such that the analysis required under section 5–501 of the Order has the potential to influence the regulation. This proposed action is not subject to Executive Order 13045 because it is based solely on technology performance.

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

This proposed rule is not a ''significant energy action'' as defined in Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355, May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Further, we have concluded that this proposed rule is not likely to have any adverse energy effects. This proposal will result in the addition of control equipment and monitoring systems for existing and new sources. We estimate the additional electrical demand to be 784 million kWhr per year and the natural gas use to be 672 million cubic feet for existing sources. At the end of the fifth year following promulgation, electrical demand from new sources will be 180 million kWhr per year and natural gas use will be 171 million cubic feet.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (''NTTAA''), Public Law

104–113 (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards (VCS) in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. VCS are technical standards (*e.g.*, materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by VCS bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable VCS.

Consistent with the NTTAA, EPA conducted searches through the Enhanced NSSN Database managed by the American National Standards Institute (ANSI). We also contacted VCS organizations, and accessed and searched their databases.

This proposed rulemaking involves technical standards. EPA proposes to use ASTM D6348–03, ''Determination of Gaseous Compounds by Extractive Direct Interface Fourier Transform (FTIR) Spectroscopy'', as an acceptable alternative to EPA Method 320 providing the following conditions are met.

(1) The test plan preparation and implementation in the Annexes to ASTM D6348–03, Sections A1 through A8 are mandatory.

(2) In ASTM D6348–03 Annex A5 (Analyte Spiking Technique), the percent (%) R must be determined for each target analyte (Equation A5.5). In order for the test data to be acceptable for a compound, %R must be 70 ≤%R ≤130. If the %R value does not meet this criterion for a target compound, the test data is not acceptable for that compound and the test must be repeated for that analyte (i.e., the sampling and/ or analytical procedure should be adjusted before a retest). The %R value for each compound must be reported in the test report, and all field measurements must be corrected with the calculated %R value for that compound by using the following equation: *Reported Result = Measured Concentration in the Stack x 100) ÷ %R.*

While the Agency has identified eight other VCS as being potentially applicable to this rule, we have decided not to use these VCS in this rulemaking. The use of these VCS would have been impractical because they do not meet the objectives of the standards cited in this rule. See the docket for this rule for the reasons for these determinations.

Under 40 CFR 60.13(i) of the NSPS General Provisions, a source may apply to EPA for permission to use alternative test methods or alternative monitoring requirements in place of any required testing methods, performance specifications, or procedures in the final rule and amendments.

EPA welcomes comments on this aspect of the proposed rulemaking and, specifically, invites the public to identify potentially-applicable voluntary consensus standards and to explain why such standards should be used in this regulation.

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

Executive Order 12898 (59 FR 7629 (Feb. 16, 1994)) establishes Federal executive policy on environmental justice. Its main provision directs Federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States. EPA has determined that these proposed amendments will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because they would increase the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. These proposed standards would reduce emissions of mercury, THC, HCl, and PM from portland cement plants located at major and area sources, decreasing the amount of such emissions to which all affected populations are exposed.

List of Subjects in 40 CFR Parts 60 and 63

Environmental protection, Air pollution control, Hazardous substances, Incorporation by reference, and Reporting and recordkeeping requirements.

Dated: April 21, 2009.

Lisa P. Jackson,

Administrator.

For the reasons stated in the preamble, title 40, chapter I, of the Code of Federal Regulations is proposed to be amended as follows:

PART 60—[AMENDED]

1. The authority citation for part 60 continues to read as follows:

Authority: 23 U.S.C. 101; 42 U.S.C. 7401–7671q.

Appendix B—[Amended]

2. Appendix B to 40 CFR Part 60 is amended to read as follows:

a. Revise Performance Specification 12A.

b. Add Performance Specification 12B.

Appendix B to Part 60—Performance Specifications

* * * * *

Performance Specification 12A— Specifications and Test Procedures for Total Vapor Phase Mercury Continuous Emission Monitoring Systems in Stationary Sources

1.0 Scope and Application

1.1 Analyte. The analyte measured by these procedures and specifications is total vapor phase Hg in the flue gas, which represents the sum of elemental Hg (Hg°, CAS Number 7439–97–6) and oxidized forms of gaseous Hg (Hg^{+2}), in mass concentration units of micrograms per dry standard cubic meter (μg/dscm).

1.2 Applicability.

1.2.1 This specification is for evaluating the acceptability of total vapor phase Hg continuous emission monitoring systems (CEMS) installed at stationary sources at the time of or soon after installation and whenever specified in the regulations. The Hg CEMS must be capable of measuring the total mass concentration in μg/dscm (regardless of speciation) of vapor phase Hg, and recording that concentration on a wet or dry basis. Particle bound Hg is not included in the measurements.

1.2.2 This specification is not designed to evaluate an installed CEMS's performance over an extended period of time nor does it identify specific calibration techniques and auxiliary procedures to assess the CEMS's performance. The source owner or operator, however, is responsible to calibrate, maintain, and operate the CEMS properly. The Administrator may require, under Clean Air Act section 114, the operator to conduct CEMS performance evaluations at other times besides the initial test to evaluate the CEMS performance. See § 60.13(c).

2.0 Summary of Performance Specification

Procedures for measuring CEMS relative accuracy, linearity, and calibration errors are outlined. CEMS installation and measurement location specifications, and data reduction procedures are included. Conformance of the CEMS with the Performance Specification is determined.

3.0 Definitions

3.1 *Continuous Emission Monitoring System (CEMS)* means the total equipment required for the determination of a pollutant concentration. The system consists of the following major subsystems:

3.2 *Sample Interface* means that portion of the CEMS used for one or more of the following: sample acquisition, sample transport, sample conditioning, and protection of the monitor from the effects of the stack effluent.

3.3 *Hg Analyzer* means that portion of the Hg CEMS that measures the total vapor phase

Hg mass concentration and generates a proportional output.

3.4 *Data Recorder* means that portion of the CEMS that provides a permanent electronic record of the analyzer output. The data recorder may provide automatic data reduction and CEMS control capabilities.

3.5 *Span Value* means the upper limit of the intended Hg concentration measurement range. The span value is a value equal to two times the emission standard.

3.6 *Linearity* means the absolute value of the difference between the concentration indicated by the Hg analyzer and the known concentration of a reference gas, expressed as a percentage of the span value, when the entire CEMS, including the sampling interface, is challenged. A linearity test procedure is performed to document the linearity of the Hg CEMS at three or more points over the measurement range.

3.7 *Calibration Drift (CD)* means the absolute value of the difference between the CEMS output response and either the upscale Hg reference gas or the zero-level Hg reference gas, expressed as a percentage of the span value, when the entire CEMS, including the sampling interface, is challenged after a stated period of operation during which no unscheduled maintenance, repair, or adjustment took place.

3.8 *Relative Accuracy (RA)* means the absolute mean difference between the pollutant concentration(s) determined by the CEMS and the value determined by the reference method (RM) plus the 2.5 percent error confidence coefficient of a series of tests divided by the mean of the RM tests. Alternatively, for sources with an average RM concentration less than 5.0 µg/dscm, the RA may be expressed as the absolute value of the difference between the mean CEMS and RM values.

4.0 Interferences [Reserved]

5.0 Safety

The procedures required under this performance specification may involve hazardous materials, operations, and equipment. This performance specification may not address all of the safety problems associated with these procedures. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicable regulatory limitations prior to performing these procedures. The CEMS user's manual and materials recommended by the RM should be consulted for specific precautions to be taken.

6.0 Equipment and Supplies

6.1 CEMS Equipment Specifications.
6.1.1 Data Recorder Scale. The Hg CEMS data recorder output range must include zero and a high level value. The high level value must be approximately two times the Hg concentration corresponding to the emission standard level for the stack gas under the circumstances existing as the stack gas is sampled. A lower high level value may be used, provided that the measured values do not exceed 95 percent of the high level value.
6.1.2 The CEMS design should also provide for the determination of CE at a zero value (zero to 20 percent of the span value)

and at an upscale value (between 50 and 100 percent of the high-level value).

6.2 Reference Gas Delivery System. The reference gas delivery system must be designed so that the flowrate of reference gas introduced to the CEMS is the same at all three challenge levels specified in Section 7.1, and at all times exceeds the flow requirements of the CEMS.

6.3 Other equipment and supplies, as needed by the applicable reference method used. See Section 8.6.2.

7.0 Reagents and Standards

7.1 Reference Gases. Reference gas standards are required for both elemental and oxidized Hg (Hg and mercuric chloride, $HgCl_2$). The use of National Institute of Standards and Technology (NIST)-certified or NIST-traceable standards and reagents is required. The following gas concentrations are required.

7.1.1 Zero-level. 0 to 20 percent of the span value.
7.1.2 Mid-level. 50 to 60 percent of the span value.
7.1.3 High-level. 80 to 100 percent of the span value.

7.2 Reference gas standards may also be required for the reference methods. See Section 8.6.2.

8.0 Performance Specification Test Procedure

8.1 Installation and Measurement Location Specifications.

8.1.1 CEMS Installation. Install the CEMS at an accessible location downstream of all pollution control equipment. Since the Hg CEMS sample system normally extracts gas from a single point in the stack, use a location that has been shown to be free of stratification for Hg or alternatively, SO_2 and NO_X through concentration measurement traverses for those gases. If the cause of failure to meet the RA test requirement is determined to be the measurement location and a satisfactory correction technique cannot be established, the Administrator may require the CEMS to be relocated. Measurement locations and points or paths that are most likely to provide data that will meet the RA requirements are listed below.

8.1.2 Measurement Location. The measurement location should be (1) at least two equivalent diameters downstream of the nearest control device, point of pollutant generation or other point at which a change of pollutant concentration may occur, and (2) at least half an equivalent diameter upstream from the effluent exhaust. The equivalent duct diameter is calculated as per 40 CFR part 60, appendix A, Method 1.

8.1.3 Hg CEMS Sample Extraction Point. Use a sample extraction point either (1) no less than 1.0 meter from the stack or duct wall, or (2) within the centroidal velocity traverse area of the stack or duct cross section.

8.2 RM Measurement Location and Traverse Points. Refer to Performance Specification 2 (PS 2) of this appendix. The RM and CEMS locations need not be immediately adjacent.

8.3 Linearity Test Procedure. The Hg CEMS must be constructed to permit the

introduction of known concentrations of Hg and $HgCl_2$ separately into the sampling system of the CEMS immediately preceding the sample extraction filtration system such that the entire CEMS can be challenged. Sequentially inject each of at least three reference gases (zero, mid-level, and high level) for each Hg species. Record the CEMS response and subtract the reference value from the CEMS value, and express the absolute value of the difference as a percentage of the span value (see example data sheet in Figure 12A–1). For each reference gas, the absolute value of the difference between the CEMS response and the reference value shall not exceed 5 percent of the span value. If this specification is not met, identify and correct the problem before proceeding.

8.4 7-Day CD Test Procedure.

8.4.1 CD Test Period. While the affected facility is operating at more than 50 percent of normal load, or as specified in an applicable regulation, determine the magnitude of the CD once each day (at 24-hour intervals, to the extent practicable) for 7 consecutive unit operating days according to the procedure given in Sections 8.4.2 through 8.4.3. The 7 consecutive unit operating days need not be 7 consecutive calendar days. Use either Hg° or $HgCl_2$ standards for this test.

8.4.2 The purpose of the CD measurement is to verify the ability of the CEMS to conform to the established CEMS response used for determining emission concentrations or emission rates. Therefore, if periodic automatic or manual adjustments are made to the CEMS zero and upscale response settings, conduct the CD test immediately before these adjustments, or conduct it in such a way that the CD can be determined.

8.4.3 Conduct the CD test using the zero gas specified and either the mid-level or high-level point specified in Section 7.1. Introduce the reference gas to the CEMS. Record the CEMS response and subtract the reference value from the CEMS value, and express the absolute value of the difference as a percentage of the span value (see example data sheet in Figure 12A–1). For the reference gas, the absolute value of the difference between the CEMS response and the reference value shall not exceed 5 percent of the span value. If this specification is not met, identify and correct the problem before proceeding.

8.5 RA Test Procedure.

8.5.1 RA Test Period. Conduct the RA test according to the procedure given in Sections 8.5.2 through 8.6.6 while the affected facility is operating at normal full load, or as specified in an applicable subpart. The RA test may be conducted during the CD test period.

8.5.2 RM. Unless otherwise specified in an applicable subpart of the regulations, use Method 29, Method 30A, or Method 30B in appendix A to this part or American Society of Testing and Materials (ASTM) Method D6784–02 (incorporated by reference, see § 60.17) as the RM for Hg concentration. The filterable portion of the sample need not be included when making comparisons to the CEMS results. When Method 29, Method

30B, or ASTM D6784–02 is used, conduct the RM test runs with paired or duplicate sampling systems. When Method 30A is used, paired sampling systems are not required. If the RM and CEMS measure on a different moisture basis, data derived with Method 4 in appendix A to this part shall also be obtained during the RA test.

8.5.3 Sampling Strategy for RM Tests. Conduct the RM tests in such a way that they will yield results representative of the emissions from the source and can be compared to the CEMS data. It is preferable to conduct moisture measurements (if needed) and Hg measurements simultaneously, although moisture measurements that are taken within an hour of the Hg measurements may be used to adjust the Hg concentrations to a consistent moisture basis. In order to correlate the CEMS and RM data properly, note the beginning and end of each RM test period for each paired RM run (including the exact time

of day) on the CEMS chart recordings or other permanent record of output.

8.5.4 Number and Length of RM and Tests. Conduct a minimum of nine RM test runs. When Method 29, Method 30B, or ASTM D6784–02 is used, only test runs for which the paired RM trains meet the relative deviation criteria (RD) of this PS shall be used in the RA calculations. In addition, for Method 29 and ASTM D6784–02, use a minimum sample time of 2 hours and for Method 30A use a minimum sample time of 30 minutes.

Note: More than nine sets of RM tests may be performed. If this option is chosen, paired RM test results may be excluded so long as the total number of paired RM test results used to determine the CEMS RA is greater than or equal to nine. However, all data must be reported including the excluded data.

8.5.5 Correlation of RM and CEMS Data. Correlate the CEMS and the RM test data as to the time and duration by first determining from the CEMS final output (the one used for

reporting) the integrated average pollutant concentration for each RM test period. Consider system response time, if important, and confirm that the results are on a consistent moisture basis with the RM test. Then, compare each integrated CEMS value against the corresponding RM value. When Method 29, Method 30A, Method 30B, or ASTM D6784–02 is used, compare each CEMS value against the corresponding average of the paired RM values.

8.5.6 Paired RM Outliers.

8.5.6.1 When Method 29, Method 30B, or ASTM D6784–02 is used, outliers are identified through the determination of relative deviation (RD) of the paired RM tests. Data that do not meet the criteria should be flagged as a data quality problem. The primary reason for performing paired RM sampling is to ensure the quality of the RM data. The percent RD of paired data is the parameter used to quantify data quality. Determine RD for two paired data points as follows:

$$RD = \frac{|C_a - C_b|}{C_a + C_b} \, x \, 100 \qquad \text{(Equation 12A-1)}$$

Where: C_a and C_b are concentration values determined from each of the two samples, respectively.

8.5.6.2 A minimum performance criteria for RM Hg data is that RD for any data pair must be ≤10 percent as long as the mean Hg concentration is greater than 1.0 $\mu gm/m^3$. If the mean Hg concentration is less than or equal to 1.0 $\mu gm/m^3$, the RD must be ≤20 percent. Pairs of RM data exceeding these RD criteria should be eliminated from the data set used to develop a Hg CEMS correlation or to assess CEMS RA.

8.5.7 Calculate the mean difference between the RM and CEMS values in the units of micrograms per cubic meter ($\mu gm/m^3$), the standard deviation, the confidence coefficient, and the RA according to the procedures in Section 12.0.

8.6 Reporting. At a minimum (check with the appropriate EPA Regional Office, State or local Agency for additional requirements, if any), summarize in tabular form the results of the RD tests and the RA tests or alternative RA procedure, as appropriate. Include all data sheets, calculations, charts (records of CEMS responses), reference gas concentration certifications, and any other information necessary to confirm that the performance of the CEMS meets the performance criteria.

9.0 Quality Control [Reserved]

10.0 Calibration and Standardization [Reserved]

11.0 Analytical Procedure

Sample collection and analysis are concurrent (see Section 8.0). Refer to the RM employed for specific analytical procedures.

12.0 Calculations and Data Analysis

Summarize the results on a data sheet similar to Figure 2–2 for PS 2.

12.1 Consistent Basis. All data from the RM and CEMS must be compared in units of $\mu gm/m^3$, on a consistent and identified moisture basis. The values must be standardized to 20 °C, 760 mm Hg.

12.1.1 Moisture Correction (as applicable). If the RM and CEMS measure Hg on a different moisture basis, use Equation 12A–2 to make the appropriate corrections to the Hg concentrations.

$$Concentration_{(dry)} = \frac{Concentration_{(wet)}}{(1 - B_{ws})} \qquad \text{(Equation 12A-2)}$$

Where: B_{ws} is the moisture content of the flue gas from Method 4, expressed as a decimal fraction (e.g., for 8.0 percent H_2O, $B_{ws} = 0.08$).

12.2 Arithmetic Mean. Calculate the arithmetic mean of the difference, d, of a data set as follows:

$$\bar{d} = \frac{1}{n} \sum_{i=1}^{n} d_i \qquad \text{(Equation 12A-3)}$$

Where: n = Number of data points.

12.3 Standard Deviation. Calculate the standard deviation, S_d, as follows:

$$S_d = \left[\frac{\sum_{i=1}^{n} d_i^2 - \frac{\left[\sum_{i=1}^{n} d_i\right]^2}{n}}{n-1} \right]^{\frac{1}{2}} \quad \text{(Equation 12A-4)}$$

Where:

$$\sum_{i=1}^{n} d_i = \text{Algebraic sum of the individual differences } d_i.$$

12.3   Confidence Coefficient (CC). Calculate the 2.5 percent error confidence coefficient (one-tailed), CC, as follows:

$$CC = t_{0.975} \frac{S_d}{\sqrt{n}} \quad \text{(Equation 12A-5)}$$

12.4   RA. Calculate the RA of a set of data as follows:

$$RA = \frac{\left\lfloor \left| \bar{d} \right| + \left| CC \right| \right\rfloor}{\overline{RM}} \, x\, 100 \quad \text{(Equation 12A-6)}$$

Where:

$|\bar{d}|$ = Absolute value of the mean differences (from Equation 12A–3).

$|CC|$ = Absolute value of the confidence coefficient (from Equation 12A–5).

$\bar{RM}$ = Average RM value.

13.0   Method Performance

13.1   Linearity. Linearity is assessed at zero-level, mid-level and high-level values as given below using standards for both Hg⁰ and HgCl₂. The mean difference between the indicated CEMS concentration and the reference concentration value for each standard shall be no greater than 5 percent of the span value.

13.2   CD. The CD shall not exceed 5 percent of the span value on any of the 7 days of the CD test.

13.3   RA. The RA of the CEMS must be no greater than 10 percent of the mean value of the RM test data in terms of units of μg/dscm. Alternatively, (1) if the mean RM is less than 10.0 μg/dscm, then the RA of the CEMS must be no greater than 20 percent, or (2) if the mean RM is less than 5.0 μgm/m³, the results are acceptable if the absolute value of the

difference between the mean RM and CEMS values does not exceed 1.0 μg/dscm.

14.0   Pollution Prevention [Reserved]

15.0   Waste Management [Reserved]

16.0   Alternative Procedures [Reserved]

17.0   Bibliography

17.1   40 CFR part 60, appendix B, ''Performance Specification 2—Specifications and Test Procedures for SO₂ and NOₓ Continuous Emission Monitoring Systems in Stationary Sources.''

17.2   40 CFR part 60, appendix A, ''Method 29—Determination of Metals Emissions from Stationary Sources.''

17.3   40 CFR part 60, appendix A, ''Method 30A—Determination of Total Vapor Phase Mercury Emissions From Stationary Sources (Instrumental Analyzer Procedure).

17.4   40 CFR part 60, appendix A, ''Method 30B—Determination of Total Vapor Phase Mercury Emissions From Coal-Fired Combustion Sources Using Carbon Sorbent Traps.''

17.5   ASTM Method D6784–02, ''Standard Test Method for Elemental, Oxidized, Particle-Bound and Total Mercury in Flue

Gas Generated from Coal-Fired Stationary Sources (Ontario Hydro Method).''

18.0   Tables and Figures

TABLE 12A–1—T–VALUES

nª	t₀.₉₇₅
2	12.706
3	4.303
4	3.182
5	2.776
6	2.571
7	2.447
8	2.365
9	2.306
10	2.262
11	2.228
12	2.201
13	2.179
14	2.160
15	2.145
16	2.131

ª The values in this table are already corrected for n–1 degrees of freedom. Use n equal to the number of individual values.

FIGURE 12A–1—LINEARITY AND CE DETERMINATION

	Date	Time	Reference Gas value μgm/m³	CEMS measured value μgm/m³	Absolute difference	CE (% of span value)
Zero level						
Mid level						

FIGURE 12A–1—LINEARITY AND CE DETERMINATION—Continued

	Date	Time	Reference Gas value µgm/m³	CEMS measured value µgm/m³	Absolute difference	CE (% of span value)
High level						

Performance Specification 12B— Specifications and Test Procedures for Monitoring Total Vapor Phase Mercury Emissions From Stationary Sources Using a Sorbent Trap Monitoring System

1.0 Scope and Application

The purpose of Performance Specification 12B (PS 12B) is to evaluate the acceptability of sorbent trap monitoring systems used to monitor total vapor-phase mercury (Hg) emissions in stationary source flue gas streams. These monitoring systems involve continuous repetitive in-stack sampling using paired sorbent media traps with periodic analysis of the time-integrated samples. Persons using PS 12B should have a thorough working knowledge of Methods 1, 2, 3, 4, 5 and 30B in appendices A–1 through A–3 and A–8 to this part.

1.1 Analyte.

The analyte measured by these procedures and specifications is total vapor phase Hg in the flue gas, which represents the sum of elemental Hg (Hg⁰, CAS Number 7439–97–6) and gaseous forms of oxidized Hg (Hg⁺²) in mass concentration units of micrograms per dry standard cubic meter (µg/dscm).

1.2 Applicability.

1.2.1 These procedures are only intended for use under relatively low particulate conditions (e.g., monitoring after all pollution control devices). This specification is for evaluating the acceptability of total vapor phase Hg sorbent trap monitoring systems installed at stationary sources at the time of, or soon after, installation and whenever specified in the regulations. The Hg monitoring system must be capable of measuring the total mass concentration in µg/dscm (regardless of speciation) of vapor phase Hg.

1.2.2 This specification is not designed to evaluate an installed sorbent trap monitoring system's performance over an extended period of time nor does it identify specific techniques and auxiliary procedures to assess the system's performance. The source owner or operator, however, is responsible to calibrate, maintain, and operate the monitoring system properly. The Administrator may require, under Clean Air Act section 114, the operator to conduct performance evaluations at other times besides the initial test to evaluate the CEMS performance. See § 60.13(c).

2.0 Principle

Known volumes of flue gas are continuously extracted from a stack or duct through paired, in-stack, pre-spiked sorbent media traps at appropriate nominal flow rates. The sorbent traps in the sampling system are periodically exchanged with new ones, prepared for analysis as needed, and analyzed by any technique that can meet the performance criteria. For quality-assurance purposes, a section of each sorbent trap is spiked with Hg⁰ prior to sampling. Following sampling, this section is analyzed separately and a specified percentage of the spike must be recovered. Paired train sampling is required to determine method precision.

3.0 Definitions

3.1 *Sorbent Trap Monitoring System (STMS)* means the total equipment required for the collection of paired trap gaseous Hg samples using paired three-partition sorbent traps. Refer to Method 30B in this subpart for a complete description of the needed equipment.

3.2 *Relative Accuracy (RA)* means the absolute mean difference between the pollutant concentration(s) determined by the CMS and the value determined by the reference method (RM) plus the 2.5 percent error confidence coefficient of a series of tests divided by the mean of the RM tests. Alternatively, for low concentration sources, the RA may be expressed as the absolute value of the difference between the mean STMS and RM values. It is used to assess the bias of the STMS.

3.3 *Relative Deviation (RD)* means the absolute difference of the analyses of a paired set of traps divided by the sum of those analyses, expressed as a percentage. It is used to assess the precision of the STMS.

3.4 *Spike Recovery* means the amount of Hg mass measured from the spiked trap section as a percentage of the amount spiked. It is used to assess sample matrix interference.

4.0 Interferences [Reserved]

5.0 Safety

The procedures required under this performance specification may involve hazardous materials, operations, and equipment. This performance specification may not address all of the safety problems associated with these procedures. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicable regulatory limitations prior to performing these procedures.

6.0 Equipment and Supplies

6.1 STMS Equipment Specifications.

6.1.1 Sampling System. The equipment described in Method 30B in appendix A–8 to this subpart shall be used to continuously sample for Hg emissions, with the substitution of three-section traps in place of two-section traps, as described below. A typical sorbent trap sampling system is shown in Figure 12B–1.

6.1.2 Three-Section Sorbent Traps. The sorbent media used to collect Hg must be configured in traps with three distinct and identical segments or sections, connected in series, to be separately analyzed. Section 1 is designated for primary capture of gaseous Hg. Section 2 is designated as a backup section for determination of vapor-phase Hg breakthrough. Section 3 is designated for QA/QC purposes where this section shall be spiked with a known amount of gaseous Hg⁰ prior to sampling and later analyzed to determine recovery efficiency.

Sampling Console
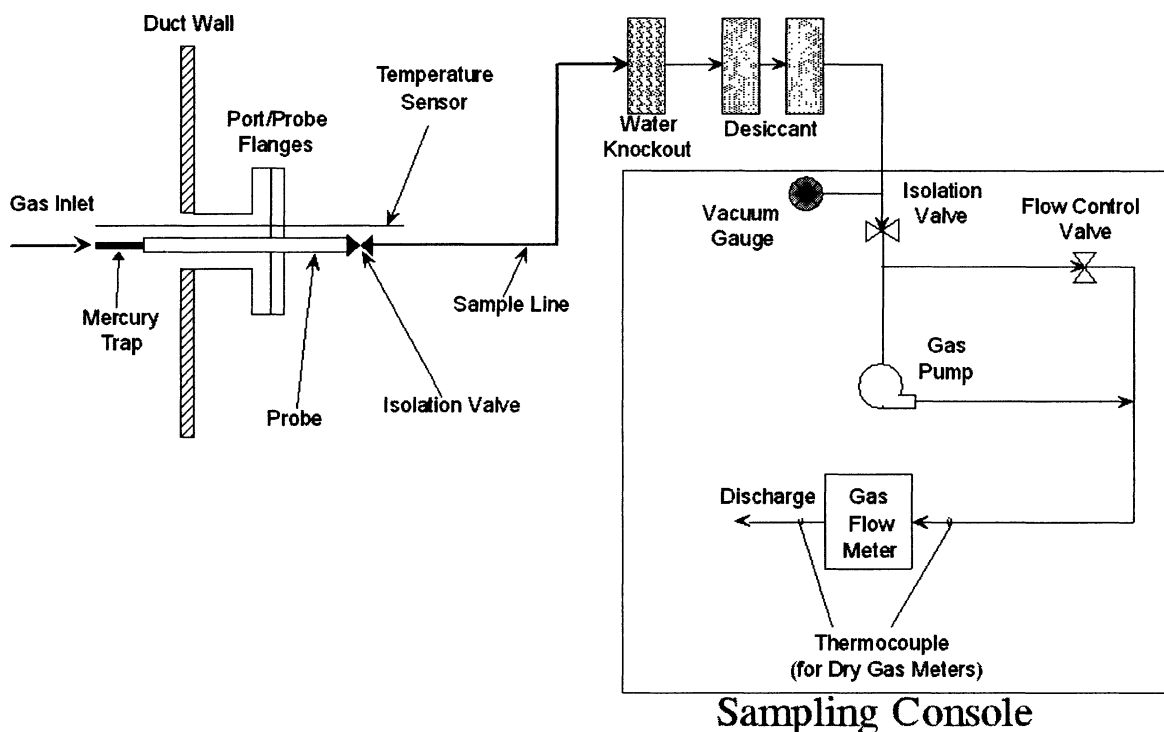
6.1.3 Gaseous Hg⁰ Sorbent Trap Spiking System. A known mass of gaseous Hg⁰ must be spiked onto section 3 of each sorbent trap prior to sampling. Any approach capable of quantitatively delivering known masses of Hg⁰ onto sorbent traps is acceptable. Several technologies or devices are available to meet this objective. Their practicality is a function of Hg mass spike levels. For low levels, NIST-certified or NIST-traceable gas generators or tanks may be suitable, but will likely require long preparation times. A more practical, alternative system, capable of delivering almost any mass required, makes use of NIST-certified or NIST-traceable Hg salt solutions (e.g., $Hg(NO_3)_2$). With this system, an aliquot of known volume and concentration is added to a reaction vessel containing a reducing agent (e.g., stannous chloride); the Hg salt solution is reduced to Hg⁰ and purged onto section 3 of the sorbent trap using an impinger sparging system.

6.1.4 Sample Analysis Equipment. Any analytical system capable of quantitatively recovering and quantifying total gaseous Hg from sorbent media is acceptable provided that the analysis can meet the performance criteria in Table 12B–1 in section 9 of this performance specification. Candidate recovery techniques include leaching, digestion, and thermal desorption. Candidate analytical techniques include ultraviolet atomic fluorescence (UV AF); ultraviolet atomic absorption (UV AA), with and without gold trapping; and in-situ X-ray fluorescence (XRF) analysis.

7.0 Reagents and Standards

Only NIST-certified or NIST-traceable calibration gas standards and reagents shall be used for the tests and procedures required under this performance specification. The sorbent media may be any collection material (e.g., carbon, chemically-treated filter, etc.)

capable of quantitatively capturing and recovering for subsequent analysis, all gaseous forms of Hg in the emissions from the intended application. Selection of the sorbent media shall be based on the material's ability to achieve the performance criteria contained in this method as well as the sorbent's vapor phase Hg capture efficiency for the emissions matrix and the expected sampling duration at the test site.

8.0 Performance Specification Test Procedure

8.1 Installation and Measurement Location Specifications.

8.1.1 Selection of Sampling Site. Sampling site information should be obtained in accordance with Method 1 in appendix A–1 to this part. Identify a monitoring location representative of source Hg emissions. Locations shown to be free of stratification through measurement traverses for Hg or other gases such as SO_2 and NO_x may be one such approach. An estimation of the expected stack Hg concentration is required to establish a target sample flow rate, total gas sample volume, and the mass of Hg⁰ to be spiked onto section 3 of each sorbent trap.

8.1.2 Pre-sampling Spiking of Sorbent Traps. Based on the estimated Hg concentration in the stack, the target sample rate and the target sampling duration, calculate the expected mass loading for section 1 of each sorbent trap (for an example calculation, see Section 12.1 of this performance specification). The pre-sampling spike to be added to section 3 of each sorbent trap shall be within ± 50 percent of the expected section 1 mass loading. Spike section 3 of each sorbent trap at this level, as described in Section 6.1.3 of this performance specification. For each sorbent trap, keep a record of the mass of Hg⁰ added

to section 3. This record shall include, at a minimum, the identification number of the trap, the date and time of the spike, the name of the analyst performing the procedure, the method of spiking, the mass of Hg⁰ added to section 3 of the trap (μg), and the supporting calculations.

8.1.3 Pre-test Leak Check. Perform a leak check with the sorbent traps in place in the sampling system. Draw a vacuum in each sample train. Adjust the vacuum in each sample train to ~15″ Hg. Use the gas flow meter to determine leak rate. The leakage rate must not exceed 4 percent of the target sampling rate. Once the leak check passes this criterion, carefully release the vacuum in the sample train, then seal the sorbent trap inlet until the probe is ready for insertion into the stack or duct.

8.1.4 Determination of Flue Gas Characteristics. Determine or measure the flue gas measurement environment characteristics (gas temperature, static pressure, gas velocity, stack moisture, etc.) in order to determine ancillary requirements such as probe heating requirements (if any), sampling rate, proportional sampling conditions, moisture management, etc.

8.2 Sample Collection.

8.2.1 Prepare to Sample. Remove the plug from the end of each sorbent trap and store each plug in a clean sorbent trap storage container. Remove the stack or duct port cap and insert the probe(s). Secure the probe(s) and ensure that no leakage occurs between the duct and environment. Record initial data including the sorbent trap ID, start time, starting gas flow meter readings, initial temperatures, set points, and any other appropriate information.

8.2.2 Flow Rate Control. Set the initial sample flow rate at the target value from section 8.1.1 of this performance specification. Then, for every operating hour

during the sampling period, record the date and time, the sample flow rate, the gas flow meter reading, the stack temperature (if needed), the flow meter temperatures (if needed), temperatures of heated equipment such as the vacuum lines and the probes (if heated), and the sampling system vacuum readings. Also, record the stack gas flow rate, as measured by the certified flow monitor, and the ratio of the stack gas flow rate to the sample flow rate. Adjust the sampling flow rate to maintain proportional sampling, i.e., keep the ratio of the stack gas flow rate to sample flow rate within ±25 percent of the reference ratio from the first hour of the data collection period (see section 12.2 of this performance specification). The sample flow rate through a sorbent trap monitoring system during any hour (or portion of an hour) that the unit is not operating shall be zero.

8.2.3 Stack Gas Moisture Determination. If data from the sorbent trap monitoring system will be used to calculate Hg mass emissions, determine the stack gas moisture content using a certified continuous moisture monitoring system.

8.2.4 Essential Operating Data. Obtain and record any essential operating data for the facility during the test period, e.g., the barometric pressure for correcting the sample volume measured by a dry gas meter to standard conditions. At the end of the data collection period, record the final gas flow meter reading and the final values of all other essential parameters.

8.2.5 Post-test Leak Check. When sampling is completed, turn off the sample pump, remove the probe/sorbent trap from the port and carefully re-plug the end of each sorbent trap. Perform a leak check with the sorbent traps in place, at the maximum vacuum reached during the sampling period. Use the same general approach described in section 8.1.3 of this performance specification. Record the leakage rate and vacuum. The leakage rate must not exceed 4 percent of the average sampling rate for the data collection period. Following the leak check, carefully release the vacuum in the sample train.

8.2.6 Sample Recovery. Recover each sampled sorbent trap by removing it from the

probe and seal both ends. Wipe any deposited material from the outside of the sorbent trap. Place the sorbent trap into an appropriate sample storage container and store/preserve it in an appropriate manner.

8.2.7 Sample Preservation, Storage, and Transport. While the performance criteria of this approach provide for verification of appropriate sample handling, it is still important that the user consider, determine, and plan for suitable sample preservation, storage, transport, and holding times for these measurements. Therefore, procedures such as those in ASTM D6911B03 "Standard Guide for Packaging and Shipping Environmental Samples for Laboratory Analysis" should be followed for all samples.

8.2.8 Sample Custody. Proper procedures and documentation for sample chain of custody are critical to ensuring data integrity. Chain of custody procedures such as in ASTM D4840B99 (reapproved 2004) "Standard Guide for Sample Chain-of-Custody Procedures" should be followed for all samples (including field samples and blanks).

8.3 Sorbent Trap Monitoring System RATA Procedures

For the initial certification of a sorbent trap monitoring system, a RATA is required. For ongoing QA purposes, the RATA must be repeated annually. To the extent practicable, the annual RATAs should be performed in the same quarter of the calendar year.

8.3.1 Reference Methods. Acceptable Hg reference methods for the RATA of a sorbent trap system include ASTM D6784–02 (the Ontario Hydro Method), Method 29 in appendix A–8 to this part, Method 30A in appendix A–8 to this part, and Method 30B in appendix A–8 to this part. When the Ontario Hydro Method or Method 29 is used, paired sampling trains are required. To validate an Ontario Hydro or Method 29 test run, the relative deviation (RD), calculated according to Section 11.6 of this performance specification, must not exceed 10 percent, when the average concentration is greater than 1.0 μg/m³. If the average concentration is ≤# 1.0 μg/m³, the RD must not exceed 20 percent. The RD results are also acceptable if

the absolute difference between the Hg concentrations measured by the paired trains does not exceed 0.03 μg/m³. If the RD criterion is met, the run is valid. For each valid run, average the Hg concentrations measured by the two trains (vapor phase Hg, only).

8.3.2 Special Considerations. A minimum of 9 valid runs are required for each RATA. If more than 9 runs are performed, a maximum of three runs may be discarded. The time per run must be long enough to collect a sufficient mass of Hg to analyze. The type of sorbent material used by the traps must be the same as for daily operation of the monitoring system; however, the size of the traps used for the RATA may be smaller than the traps used for daily operation of the system. Spike the third section of each sorbent trap with elemental Hg, as described in section 8.1.2 of this performance specification. Install a new pair of sorbent traps prior to each test run. For each run, the sorbent trap data shall be validated according to the quality assurance criteria in Table 12B–1 in section 9.0. Calculate the relative accuracy (RA) of the STMS, on a μg/dscm basis, according to sections 12.2 through 12.5 of Performance Specification 2 in appendix B to this part. The RA of the STMS must be no greater than 10 percent of the mean value of the RM test data in terms of units of μg/dscm. Alternatively, (1) if the mean RM is less than 10.0 μg/dscm, then the RA of the STMS must be no greater than 20 percent, or (2) if the RM is less than 2.0 μg/dscm, then the RA results are acceptable if the absolute difference between the means of the RM and STMS values does not exceed 0.5 μg/dscm.

9.0 Quality Assurance and Quality Control (QA/QC)

Table 12B–1 summarizes the QA/QC performance criteria that are used to validate the Hg emissions data from sorbent trap monitoring systems. Failure to achieve these performance criteria will result in invalidation of Hg emissions data, except where otherwise noted.

TABLE 12B–1—QA/QC CRITERIA FOR SORBENT TRAP MONITORING SYSTEMS

QA/QC test or specification	Acceptance criteria	Frequency	Consequences if not met
Pre-test leak check	≤4% of target sampling rate	Prior to sampling	Sampling shall not commence until the leak check is passed.
Post-test leak check.	≤4% of average sampling rate	After sampling	Invalidate the data from the paired traps or, if certain conditions are met, report adjusted data from a single trap. (*see* Section 12.7.1.3)
Ratio of stack gas flow rate to sample flow rate.	No more than 5% of the hourly ratios or 5 hourly ratios (whichever is less restrictive) may deviate from the reference ratio by more than ± 25%.	Every hour throughout data collection period.	Invalidate the data from the paired traps or, if certain conditions are met, report adjusted data from a single trap. (*see* Section 12.7.1.3)
Sorbent trap section 2 breakthrough.	≤5% of Section 1 Hg mass	Every sample	Invalidate the data from the paired traps or, if certain conditions are met, report adjusted data from a single trap. (*see* Section 12.7.1.3)

TABLE 12B–1—QA/QC CRITERIA FOR SORBENT TRAP MONITORING SYSTEMS—Continued

QA/QC test or specification	Acceptance criteria	Frequency	Consequences if not met
Paired sorbent trap agreement	≤10% Relative Deviation (RD) if the average concentration is > 1.0 μg/m³. ≤20% RD if the average concentration is ≤1.0 μg/m³. Results also acceptable if absolute difference between concentrations from paired traps is ≤0.03 μg/m³.	Every sample	Either invalidate the data from the paired traps or report the results from the trap with the higher Hg concentration.
Spike Recovery Study.	Average recovery between 85% and 115% for each of the 3 spike concentration levels.	Prior to analyzing field samples and prior to use of new sorbent media.	Field samples shall not be analyzed until the percent recovery criteria has been met.
Multipoint analyzer calibration	Each analyzer reading within ±10% of true value and r²≥0.99.	On the day of analysis, before analyzing any samples.	Recalibrate until successful.
Analysis of independent calibration standard.	Within ±10% of true value	Following daily calibration, prior to analyzing field samples.	Recalibrate and repeat independent standard analysis until successful.
Spike recovery from section 3 of sorbent trap.	75–125% of spike amount	Every sample	Invalidate the data from the paired traps or, if certain conditions are met, report adjusted data from a single trap. (*see* Section 12.7.1.3)
RATA	RA ≤10.0% of RM mean value; or (1) RA ≤20.0% if RM mean value ≤10.0 μg/dscm; or (2) if RM mean value ≤2.0 μg/dscm, then absolute difference between RM mean value and STMS ≤0.5 μg/dscm.	For initial certification and annually thereafter.	Data from the system are invalidated until a RATA is passed.
Gas flow meter calibration	Calibration factor (Y) within ±5% of average value from the most recent 3-point calibration.	At three settings prior to initial use and at least quarterly at one setting thereafter. For mass flow meters, initial calibration with stack gas is required.	Recalibrate the meter at three orfice settings to determine a new value of Y.
Temperature sensor calibration	Absolute temperature measured by sensor within ±1.5% of a reference sensor.	Prior to initial use and at least quarterly thereafter.	Recalibrate. Sensor may not be used until specification is met.
Barometer calibration.	Absolute pressure measured by instrument within ±10 mm Hg of reading with a NIST-traceable barometer..	Prior to initial use and at least quarterly thereafter.	Recalibrate. Instrument may not be used until specification is met.

10.0 Calibration and Standardization

10.1 Gaseous and Liquid Standards. Only NIST certified or NIST-traceable calibration standards (i.e., calibration gases, solutions, etc.) shall be used for the spiking and analytical procedures in this performance specification.

10.2 Gas Flow Meter Calibration. The manufacturer or supplier of the gas flow meter should perform all necessary set-up, testing, programming, etc., and should provide the end user with any necessary instructions, to ensure that the meter will give an accurate readout of dry gas volume in standard cubic meters for the particular field application.

10.2.1 Initial Calibration. Prior to its initial use, a calibration of the flow meter shall be performed. The initial calibration may be done by the manufacturer, by the equipment supplier, or by the end user. If the flow meter is volumetric in nature (e.g., a dry gas meter), the manufacturer, equipment supplier, or end user may perform a direct volumetric calibration using any gas. For a mass flow meter, the manufacturer, equipment supplier, or end user may calibrate the meter using a bottled gas mixture containing 12 ±0.5% CO_2, 7 ±0.5% O_2, and balance N_2, or these same gases in proportions more representative of the expected stack gas composition. Mass flow meters may also be initially calibrated onsite, using actual stack gas.

10.2.1.1 Initial Calibration Procedures. Determine an average calibration factor (Y) for the gas flow meter, by calibrating it at three sample flow rate settings covering the range of sample flow rates at which the sorbent trap monitoring system typically operates. You may either follow the procedures in section 10.3.1 of Method 5 in appendix A–3 to this part or the procedures in section 16 of Method 5 in appendix A–3 to this part. If a dry gas meter is being calibrated, use at least five revolutions of the meter at each flow rate.

10.2.1.2 Alternative Initial Calibration Procedures. Alternatively, you may perform the initial calibration of the gas flow meter using a reference gas flow meter (RGFM). The RGFM may be either: (1) A wet test meter calibrated according to section 10.3.1 of Method 5 in appendix A–3 to this part; (2) A gas flow metering device calibrated at multiple flow rates using the procedures in section 16 of Method 5 in appendix A–3 to this part; or (3) A NIST–traceable calibration device capable of measuring volumetric flow to an accuracy of 1 percent. To calibrate the gas flow meter using the RGFM, proceed as follows: While the sorbent trap monitoring system is sampling the actual stack gas or a compressed gas mixture that simulates the stack gas composition (as applicable), connect the RGFM to the discharge of the system. Care should be taken to minimize the dead volume between the sample flow meter being tested and the RGFM. Concurrently measure dry gas volume with the RGFM and the flow meter being calibrated for a minimum of 10 minutes at each of three flow rates covering the typical range of operation of the sorbent trap monitoring system. For each 10-minute (or longer) data collection period, record the total sample volume, in units of dry standard cubic meters (dscm), measured by the RGFM and the gas flow meter being tested.

10.2.1.3 Initial Calibration Factor. Calculate an individual calibration factor Yi at each tested flow rate from section 10.2.1.1 or 10.2.1.2 of this performance specification (as applicable), by taking the ratio of the

reference sample volume to the sample volume recorded by the gas flow meter. Average the three Yi values, to determine Y, the calibration factor for the flow meter. Each of the three individual values of Yi must be within ±0.02 of Y. Except as otherwise provided in sections 10.2.1.4 and 10.2.1.5 of this performance specification, use the average Y value from the three level calibration to adjust all subsequent gas volume measurements made with the gas flow meter.

10.2.1.4   Initial On-Site Calibration Check. For a mass flow meter that was initially calibrated using a compressed gas mixture, an on-site calibration check shall be performed before using the flow meter to provide data for this part. While sampling stack gas, check the calibration of the flow meter at one intermediate flow rate typical of normal operation of the monitoring system. Follow the basic procedures in section 10.2.1.1 or 10.2.1.2 of this performance specification. If the onsite calibration check shows that the value of Yi, the calibration factor at the tested flow rate, differs by more than 5 percent from the value of Y obtained in the initial calibration of the meter, repeat the full 3-level calibration of the meter using stack gas to determine a new value of Y, and apply the new Y value to all subsequent gas volume measurements made with the gas flow meter.

10.2.1.5   Ongoing Quality Assurance. Recalibrate the gas flow meter quarterly at one intermediate flow rate setting representative of normal operation of the monitoring system. Follow the basic procedures in section 10.2.1.1 or 10.2.1.2 of this performance specification. If a quarterly recalibration shows that the value of Yi, the calibration factor at the tested flow rate, differs from the current value of Y by more than 5 percent, repeat the full 3-level calibration of the meter to determine a new value of Y, and apply the new Y value to all subsequent gas volume measurements made with the gas flow meter.

10.3   Thermocouples and Other Temperature Sensors. Use the procedures and criteria in section 10.3 of Method 2 in appendix A–1 to this part to calibrate in-stack temperature sensors and thermocouples. Calibrations must be performed prior to initial use and at least quarterly thereafter. At each calibration point, the absolute temperature measured by the temperature sensor must agree to within ±1.5 percent of the temperature measured with the reference sensor, otherwise the sensor may not continue to be used.

10.4   Barometer. Calibrate against a NIST-traceable barometer. Calibration must be performed prior to initial use and at least quarterly thereafter. At each calibration point, the absolute pressure measured by the barometer must agree to within ±10 mm Hg of the pressure measured by the NIST-traceable barometer, otherwise the barometer may not continue to be used.

10.5   Other Sensors and Gauges. Calibrate all other sensors and gauges according to the procedures specified by the instrument manufacturer(s).

10.6   Analytical System Calibration. See section 11.1 of this performance specification.

11.0   Analytical Procedures

The analysis of the Hg samples may be conducted using any instrument or technology capable of quantifying total Hg from the sorbent media and meeting the performance criteria in section 9 of this performance specification.

11.1   Analyzer System Calibration. Perform a multipoint calibration of the analyzer at three or more upscale points over the desired quantitative range (multiple calibration ranges shall be calibrated, if necessary). The field samples analyzed must fall within a calibrated, quantitative range and meet the necessary performance criteria. For samples that are suitable for aliquotting, a series of dilutions may be needed to ensure that the samples fall within a calibrated range. However, for sorbent media samples that are consumed during analysis (e.g., thermal desorption techniques), extra care must be taken to ensure that the analytical system is appropriately calibrated prior to sample analysis. The calibration curve range(s) should be determined based on the anticipated level of Hg mass on the sorbent media. Knowledge of estimated stack Hg concentrations and total sample volume may be required prior to analysis. The calibration curve for use with the various analytical techniques (e.g., UV AA, UV AF, and XRF) can be generated by directly introducing standard solutions into the analyzer or by spiking the standards onto the sorbent media and then introducing into the analyzer after preparing the sorbent/standard according to the particular analytical technique. For each calibration curve, the value of the square of the linear correlation coefficient, i.e., r^2, must be ≥ 0.99, and the analyzer response must be within ±10 percent of reference value at each upscale calibration point. Calibrations must be performed on the day of the analysis, before analyzing any of the samples. Following calibration, an independently prepared standard (not from same calibration stock solution) shall be analyzed. The measured value of the independently prepared standard must be within ±10 percent of the expected value.

11.2   Sample Preparation. Carefully separate the three sections of each sorbent trap. Combine for analysis all materials associated with each section, i.e., any supporting substrate that the sample gas passes through prior to entering a media section (e.g., glass wool, polyurethane foam, etc.) must be analyzed with that segment.

11.3   Spike Recovery Study. Before analyzing any field samples, the laboratory must demonstrate the ability to recover and quantify Hg from the sorbent media by performing the following spike recovery study for sorbent media traps spiked with elemental mercury. Using the procedures described in sections 6.2 and 12.1 of this performance specification, spike the third section of nine sorbent traps with gaseous Hg⁰, i.e., three traps at each of three different mass loadings, representing the range of masses anticipated in the field samples. This will yield a 3 x 3 sample matrix. Prepare and analyze the third section of each spiked trap, using the techniques that will be used to prepare and analyze the field samples. The average recovery for each spike concentration

must be between 85 and 115 percent. If multiple types of sorbent media are to be analyzed, a separate spike recovery study is required for each sorbent material. If multiple ranges are calibrated, a separate spike recovery study is required for each range.

11.4   Field Sample Analyses. Analyze the sorbent trap samples following the same procedures that were used for conducting the spike recovery study. The three sections of each sorbent trap must be analyzed separately (i.e., section 1, then section 2, then section 3). Quantify the total mass of Hg for each section based on analytical system response and the calibration curve from section 10.1 of this performance specification. Determine the spike recovery from sorbent trap section 3. The spike recovery must be no less than 75 percent and no greater than 125 percent. To report the final Hg mass for each trap, add together the Hg masses collected in trap sections 1 and 2.

12.0   Calculations, Data Reduction, and Data Analysis

12.1   Calculation of Pre-Sampling Spiking Level. Determine sorbent trap section 3 spiking level using estimates of the stack Hg concentration, the target sample flow rate, and the expected sample duration. First, calculate the expected Hg mass that will be collected in section 1 of the trap. The pre-sampling spike must be within ±50 percent of this mass.

Example calculation: For an estimated stack Hg concentration of 5 μg/m³, a target sample rate of 0.30 L/min, and a sample duration of 5 days:

(0.30 L/min) (1440 min/day) (5 days) (10⁻³ m³/liter) (5 μg/m³) = 10.8 μg

A pre-sampling spike of 10.8 μg ± 50 percent is, therefore, appropriate.

12.2   Calculations for Flow-Proportional Sampling. For the first hour of the data collection period, determine the reference ratio of the stack gas volumetric flow rate to the sample flow rate, as follows:

$$R_{ref} = \frac{KQ_{ref}}{F_{ref}} \qquad \text{(Equation 12B-1)}$$

Where:

R_{ref} = Reference ratio of hourly stack gas flow rate to hourly sample flow rate

Q_{ref} = Average stack gas volumetric flow rate for first hour of collection period (scfh)

F_{ref} = Average sample flow rate for first hour of the collection period, in appropriate units (e.g., liters/min, cc/min, dscm/min)

K = Power of ten multiplier, to keep the value of R_{ref} between 1 and 100. The appropriate K value will depend on the selected units of measure for the sample flow rate.

Then, for each subsequent hour of the data collection period, calculate ratio of the stack gas flow rate to the sample flow rate using Equation 12B–2:

$$R_h = \frac{KQ_h}{F_h} \qquad \text{(Equation 12B-2)}$$

Where:

R_h = Ratio of hourly stack gas flow rate to hourly sample flow rate

Q_h = Average stack gas volumetric flow rate for the hour (scfh)

F_h = Average sample flow rate for the hour, in appropriate units (e.g., liters/min, cc/min, dscm/min)

K = Power of ten multiplier, to keep the value of R_h between 1 and 100. The appropriate K value will depend on the selected units of measure for the sample flow rate and the range of expected stack gas flow rates.

Maintain the value of R_h within ±25 percent of R_{ref} throughout the data collection period.

12.3 Calculation of Spike Recovery. Calculate the percent recovery of each section 3 spike, as follows:

$$\%R = \frac{M_3}{M_s} \times 100 \qquad \text{(Equation 12B-3)}$$

Where:

%R = Percentage recovery of the pre-sampling spike

M_3 = Mass of Hg recovered from section 3 of the sorbent trap, (µg)

M_s = Calculated Hg mass of the pre-sampling spike, from section 8.1.2 of this performance specification, (µg)

12.4 Calculation of Breakthrough. Calculate the percent breakthrough to the second section of the sorbent trap, as follows:

$$\%B = \frac{M_2}{M_1} \times 100 \qquad \text{(Equation 12B-4)}$$

Where:

%B = Percent breakthrough

M_2 = Mass of Hg recovered from section 2 of the sorbent trap, (µg)

M_1 = Mass of Hg recovered from section 1 of the sorbent trap, (µg)

12.5 Calculation of Hg Concentration. Calculate the Hg concentration for each sorbent trap, using the following equation:

$$C = \frac{M^*}{V_t} \qquad \text{(Equation 12B-5)}$$

Where:

C = Concentration of Hg for the collection period, (µg/dscm)

M* = Total mass of Hg recovered from sections 1 and 2 of the sorbent trap, (µg)

V_t = Total volume of dry gas metered during the collection period, (dscm). For the purposes of this performance specification, standard temperature and pressure are defined as 20 °C and 760 mm Hg, respectively.

12.6 Calculation of Paired Trap Agreement. Calculate the relative deviation (RD) between the Hg concentrations measured with the paired sorbent traps:

$$RD = \frac{\left| C_a - C_b \right|}{C_a + C_b} \, x \, 100 \qquad \text{(Equation 12B-6)}$$

Where:

RD = Relative deviation between the Hg concentrations from traps "a" and "b" (percent)

C_a = Concentration of Hg for the collection period, for sorbent trap "a" (µg/dscm)

C_b = Concentration of Hg for the collection period, for sorbent trap "b" (µg/dscm)

12.7 Data Reduction.

12.7.1 Sorbent Trap Monitoring Systems. Typical data collection periods for normal, day-to-day operation of a sorbent trap monitoring system range from about 24 hours to 168 hours. For the required RATAs of the system, smaller sorbent traps are often used, and the data collection time per run is considerably shorter (e.g., 1 hour or less). Generally speaking, the acceptance criteria for the following five QA specifications in Table 1 above must be met to validate a data collection period: (a) The post-test leak check; (b) the ratio of stack gas flow rate to sample flow rate; (c) section 2 breakthrough; (d) paired trap agreement; and (e) section 3 spike recovery.

12.7.1.1 When both traps meet the acceptance criteria for all five QA specifications, the two measured Hg concentrations shall be averaged arithmetically and the average value shall be applied to each hour of the data collection period.

12.7.1.2 To validate a RATA run, both traps must meet the acceptance criteria for all five QA specifications. However, as discussed in Section 12.7.1.3 below, for normal day-to-day operation of the monitoring system, a data collection period may, in certain instances, be validated based on the results from one trap.

12.7.1.3 For the routine, day-to-day operation of the monitoring system, when one of the traps either: (a) Fails the post-test leak check; or (b) has excessive section 2 breakthrough; or (c) fails to maintain the

proper stack flow-to-sample flow ratio; or (d) fails to achieve the required section 3 spike recovery, provided that the other trap meets the acceptance criteria for all four of these QA specifications, the Hg concentration measured by the valid trap may be multiplied by a factor of 1.111 and used for reporting purposes. Further, if both traps meet the acceptance criteria for all four of these QA specifications, but the acceptance criterion for paired trap agreement is not met, the owner or operator may report the higher of the two Hg concentrations measured by the traps, in lieu of invalidating the data from the paired traps.

12.7.1.4 Whenever the data from a pair of sorbent traps must be invalidated and no quality-assured data from a certified backup Hg monitoring system or Hg reference method are available to cover the hours in the data collection period, treat those hours in the manner specified in the applicable regulation (i.e., use missing data substitution or count the hours as monitoring system down time, as appropriate).

13.0 Monitoring System Performance

These monitoring criteria and procedures have been successfully applied to coal-fired utility boilers (including units with post-combustion emission controls), having vapor-phase Hg concentrations ranging from 0.03 µg/dscm to 100 µg/dscm.

14.0 Pollution Prevention [Reserved]

15.0 Waste Management [Reserved]

16.0 Alternative Procedures [Reserved]

17.0 Bibliography

17.1 40 CFR part 60, appendix B, "Performance Specification 2—Specifications and Test Procedures for SO₂ and NOₓ Continuous Emission Monitoring Systems in Stationary Sources."

17.2 40 CFR part 60, appendix A, "Method 29—Determination of Metals Emissions from Stationary Sources."

17.3 40 CFR part 60, appendix A, "Method 30A—Determination of Total Vapor Phase Mercury Emissions From Stationary Sources (Instrumental Analyzer Procedure)."

17.4 40 CFR part 60, appendix A, "Method 30B—Determination of Total Vapor Phase Mercury Emissions From Coal-Fired Combustion Sources Using Carbon Sorbent Traps."

17.5 ASTM Method D6784–02, "Standard Test Method for Elemental, Oxidized, Particle-Bound and Total Mercury in Flue Gas Generated from Coal-Fired Stationary Sources (Ontario Hydro Method)."

Appendix F—[Amended]

2a. Appendix F to 40 CFR part 60 is amended to add Procedure 5 to read as follows:

Appendix F to Part 60—Quality Assurance Procedures

* * * * *

Procedure 5. Quality Assurance Requirements for Vapor Phase Mercury Continuous Emission Monitoring Systems Used for Compliance Determination at Stationary Sources

1.0 Applicability and Principle

1.1 Applicability. The purpose of Procedure 5 is to establish the minimum requirements for evaluating the effectiveness of quality control (QC) and quality assurance (QA) procedures and the quality of data produced by vapor phase mercury (Hg) continuous emission monitoring system (CEMS). Procedure 5 applies to Hg CEMS used for continuously determining compliance with emission standards or operating permit limits as specified in an applicable regulation or permit. Other QC

procedures may apply to diluent (e.g., O_2) monitors and other auxiliary monitoring equipment included with your CEMS to facilitate Hg measurement or determination of Hg concentration in units specified in an applicable regulation (e.g., Procedure 1 of this appendix for O_2 CEMS).

Procedure 5 covers the instrumental measurement of Hg as defined in Performance Specification 12A of appendix B to this part which is total vapor phase Hg representing the sum of elemental Hg (Hg^0, CAS Number 7439B97B6) and oxidized forms of gaseous Hg (Hg^{+2}).

Procedure 5 specifies the minimum requirements for controlling and assessing the quality of Hg CEMS data submitted to EPA or a delegated permitting authority. You must meet these minimum requirements if you are responsible for one or more Hg CEMS used for compliance monitoring. We encourage you to develop and implement a more extensive QA program or to continue such programs where they already exist.

You must comply with the basic requirements of Procedure 5 immediately following successful completion of the initial performance test of PS–12A.

1.2   Principle. The QA procedures consist of two distinct and equally important functions. One function is the assessment of the quality of the CEMS data by estimating accuracy. The other function is the control and improvement of the quality of the CEMS data by implementing QC policies and corrective actions. These two functions form a control loop: When the assessment function indicates that the data quality is inadequate, the quality control effort must be increased until the data quality is acceptable. In order to provide uniformity in the assessment and reporting of data quality, this procedure explicitly specifies the assessment methods for response drift, system integrity, and accuracy. Several of the procedures are based on those of Performance Specification 12A (PS–12A) in appendix B of this part. Procedure 5 also requires the analysis of audit samples concurrent with certain reference method (RM) analyses as specified in the applicable RMs.

Because the control and corrective action function encompasses a variety of policies, specifications, standards, and corrective measures, this procedure treats QC requirements in general terms to allow each source owner or operator to develop a QC system that is most effective and efficient for the circumstances.

2.0   Definitions

2.1   *Continuous Emission Monitoring System (CEMS)* means the total equipment required for the determination of a pollutant concentration.

2.2   *Span Value* means the upper limit of the intended Hg concentration measurement range that is specified in the applicable monitoring PS and/or regulatory subpart.

2.3   *Zero, Mid-Level, and High Level Values* means the CEMS response values related to the source specific span value. Determination of zero, mid-level, and high level values is defined in the appropriate PS in appendix B to this part (e.g., PS–12A).

2.4   *Calibration Drift (CD)* means the absolute value of the difference between the CEMS output response and either the upscale Hg reference gas or the zero-level Hg reference gas, expressed as a percentage of the span value, when the entire CEMS, including the sampling interface, is challenged after a stated period of operation during which no unscheduled maintenance, repair, or adjustment took place.

2.5   *System Integrity (SI) Check* means the absolute value of the difference between the CEMS output response and the reference value of either a mid-level or high-level mercuric chloride ($HgCl_2$) reference gas, expressed as a percentage of the reference value, when the entire CEMS, including the sampling interface, is challenged.

2.6   *Relative Accuracy (RA)* means the absolute mean difference between the pollutant concentration(s) determined by the CEMS and the value determined by the reference method (RM) plus the 2.5 percent error confidence coefficient of a series of tests divided by the mean of the RM tests. Alternatively, for sources with an average RM concentration less than 5.0 µg/dscm, the RA may be expressed as the absolute value of the difference between the mean CEMS and RM values.

3.0   QC Requirements

Each source owner or operator must develop and implement a QC program. At a minimum, each QC program must include written procedures which should describe in detail, complete, step-by-step procedures and operations for each of the following activities:

1. Calibration of Hg CEMS.
2. CD determination and adjustment of Hg CEMS.
3. SI Check procedures for Hg CEMS.
3. Preventive maintenance of Hg CEMS (including spare parts inventory).
4. Data recording, calculations, and reporting.
5. Accuracy audit procedures including sampling and analysis methods.
6. Program of corrective action for malfunctioning Hg CEMS.

As described in Section 5.2, whenever excessive inaccuracies occur for two consecutive quarters, the source owner or operator must revise the current written procedures or modify or replace the Hg CEMS to correct the deficiency causing the excessive inaccuracies.

These written procedures must be kept on record and available for inspection by the responsible enforcement agency.

4.0   CD Assessment

4.1   CD Requirement. As described in 40 CFR 60.13(d) and 63.8(c), source owners and operators of CEMS must check, record, and quantify the CD at two concentration values at least once daily (approximately 24 hours) in accordance with the method prescribed by the manufacturer. The CEMS calibration must, at minimum, be adjusted whenever the daily zero (or low-level) CD or the daily high-level CD exceeds two times the limits of the applicable PS in appendix B of this part.

4.2   Recording Requirement for Automatic CD Adjusting Monitors. Monitors that automatically adjust the data to the corrected calibration values (e.g., microprocessor control) must be programmed to record the unadjusted concentration measured in the CD prior to resetting the calibration, if performed, or record the amount of adjustment.

4.3   Criteria for Excessive CD. If either the zero (or low-level) or high-level CD result exceeds twice the applicable drift specification in the applicable PS in appendix B for five consecutive daily periods, the CEMS is out-of-control. If either the zero (or low-level) or high-level CD result exceeds four times the applicable drift specification in the PS in appendix B during any CD check, the CEMS is out-of-control. If the CEMS is out-of-control, take necessary corrective action. Following corrective action, repeat the CD checks.

4.3.1   Out-Of-Control Period Definition. The beginning of the out-of-control period is the time corresponding to the completion of the fifth consecutive daily CD check with a CD in excess of two times the allowable limit, or the time corresponding to the completion of the daily CD check preceding the daily CD check that results in a CD in excess of four times the allowable limit. The end of the out-of-control period is the time corresponding to the completion of the CD check following corrective action that results in the CDs at both the zero (or low-level) and high-level measurement points being within the corresponding allowable CD limit (i.e., either two times or four times the allowable limit in the applicable PS in appendix B).

4.3.2   CEMS Data Status During Out-of-Control Period. During the period the CEMS is out-of-control, the CEMS data may not be used in calculating emission compliance nor be counted towards meeting minimum data availability as required and described in the applicable subpart.

4.4   Data Recording and Reporting. As required in 40 CFR 60.7(d) and 63.10____, all measurements from the CEMS must be retained on file by the source owner for at least 2 years. However, emission data obtained on each successive day while the CEMS is out-of-control may not be included as part of the minimum daily data requirement of the applicable subpart nor be used in the calculation of reported emissions for that period.

5. Data Accuracy Assessment

5.1   Auditing Requirements. Each CEMS must be audited at least once each calendar quarter. Successive quarterly audits shall occur no closer than 2 months. The audits shall be conducted as follows:

5.1.1   Relative Accuracy Test Audit (RATA). The RATA must be conducted at least once every four calendar quarters, except as otherwise noted in section 5.1.4 of this appendix. Conduct the RATA as described for the RA test procedure in the applicable PS in appendix B (e.g., PS 12A). In addition, analyze the appropriate performance audit samples as described in the applicable reference methods.

5.1.2   Gas Audit (GA). If applicable, a GA may be conducted in three of four calendar quarters, but in no more than three quarters in succession.

To conduct a GA: (1) Challenge the CEMS with an audit gas of known concentration at two points within the following ranges:

Audit point	Audit range
1	20 to 30% of span value.
2	50 to 60% of span value.

Challenge the Hg CEMS three times at each audit point, and use the average of the three responses in determining accuracy. If using audit gas cylinders, do not dilute gas from audit cylinder when challenging the Hg CEMS.

The monitor should be challenged at each audit point for a sufficient period of time to assure adsorption-desorption of the Hg CEMS sample transport surfaces has stabilized.

(2) Operate each monitor in its normal sampling mode, i.e., pass the audit gas through all filters, scrubbers, conditioners, and other monitor components used during normal sampling, and as much of the sampling probe as is practical. At a minimum, the audit gas should be introduced at the connection between the probe and the sample line.

(3) Use elemental Hg and oxidized Hg (mercuric chloride, $HgCl_2$) audit gases that are National Institute of Standards and Technology (NIST)-certified or NIST-traceable following an EPA Traceability Protocol.

The difference between the actual concentration of the audit gas and the concentration indicated by the monitor is used to assess the accuracy of the CEMS.

5.1.3 Relative Accuracy Audit (RAA). The RAA may be conducted three of four calendar quarters, but in no more than three quarters in succession. To conduct a RAA, follow the procedure described in the applicable PS in appendix B for the relative accuracy test, except that only three sets of measurement data are required. Analyses of performance audit samples are also required.

The relative difference between the mean of the RM values and the mean of the CEMS responses will be used to assess the accuracy of the CEMS.

5.1.4 Other Alternative Audits. Other alternative audit procedures may be used as approved by the Administrator for three of four calendar quarters. One RATA is required at least every four calendar quarters, except in the case where the affected facility is off-line (does not operate) in the fourth calendar quarter since the quarter of the previous RATA. In that case, the RATA shall be performed in the quarter in which the unit recommences operation. Also, gas audits are not required for calendar quarters in which the affected facility does not operate.

5.2 Excessive Audit Inaccuracy. If the RA, using the RATA, GA, or RAA exceeds the criteria in section 5.2.3, the Hg CEMS is out-of-control. If the Hg CEMS is out-of-control, take necessary corrective action to eliminate the problem. Following corrective action, the source owner or operator must audit the CEMS with a RATA, GA, or RAA to determine if the CEMS is operating within the specifications. A RATA must always be used following an out-of-control period resulting from a RATA. The audit following

corrective action does not require analysis of performance audit samples. If audit results show the CEMS to be out-of-control, the CEMS operator shall report both the audit showing the CEMS to be out-of-control and the results of the audit following corrective action showing the CEMS to be operating within specifications.

5.2.1 Out-Of-Control Period Definition. The beginning of the out-of-control period is the time corresponding to the completion of the sampling for the RATA, RAA, or GA. The end of the out-of-control period is the time corresponding to the completion of the sampling of the subsequent successful audit.

5.2.2 CEMS Data Status During Out-Of-Control Period. During the period the monitor is out-of-control, the CEMS data may not be used in calculating emission compliance nor be counted towards meeting minimum data availability as required and described in the applicable subpart.

5.2.3 Criteria for Excessive Audit Inaccuracy. Unless specified otherwise in the applicable subpart, the criteria for excessive inaccuracy are:

(1) For the RATA, the allowable RA in the applicable PS in appendix B.

(2) For the GA, ±15 percent of the average audit value or ±5 ppm, whichever is greater.

(3) For the RAA, ±15 percent of the three run average or ±7.5 percent of the applicable standard, whichever is greater.

5.3 Criteria for Acceptable QC Procedure. Repeated excessive inaccuracies (i.e., out-of-control conditions resulting from the quarterly audits) indicates the QC procedures are inadequate or that the Hg CEMS is incapable of providing quality data. Therefore, whenever excessive inaccuracies occur for two consecutive quarters, the source owner or operator must revise the QC procedures (see Section 3) or modify or replace the Hg CEMS.

6. Calculations for Hg CEMS Data Accuracy

6.1 RATA RA Calculation. Follow the equations described in Section 12 of appendix B, PS 12A to calculate the RA for the RATA. The RATA must be calculated in units of concentration or the applicable emission standard.

6.2 RAA Accuracy Calculation. Use Equation 1–1 to calculate the accuracy for the RAA. The RAA must be calculated in units of concentration or the applicable emission standard.

6.3 GA Accuracy Calculation. Use Equation 1–1 to calculate the accuracy for the GA, which is calculated in units of the appropriate concentration (e.g., $\mu g/m^3$). Each component of the CEMS must meet the acceptable accuracy requirement.

$$ A = \frac{C_m - C_a}{C_a} \times 100 \qquad Eq.\ \text{1-1} $$

Where:

A=Accuracy of the CEMS, percent.
C_m=Average CEMS response during audit in units of applicable standard or appropriate concentration.
C_a=Average audit value (GA certified value or three-run average for RAA) in units of applicable standard or appropriate concentration.

6.4 Example Accuracy Calculations. Example calculations for the RATA, RAA, and GA are available in Citation 1.

7. Reporting Requirements

At the reporting interval specified in the applicable regulation, report for each Hg CEMS the accuracy results from Section 6 and the CD assessment results from Section 4. Report the drift and accuracy information as a Data Assessment Report (DAR), and include one copy of this DAR for each quarterly audit with the report of emissions required under the applicable subparts of this part.

As a minimum, the DAR must contain the following information:

1. Source owner or operator name and address.

2. Identification and location of each Hg CEMS.

3. Manufacturer and model number of each Hg CEMS.

4. Assessment of Hg CEMS data accuracy and date of assessment as determined by a RATA, RAA, or GA described in Section 5, including the RA for the RATA, the A for the RAA or GA, the RM results, the audit gas certified values, the CEMS responses, and the calculations results as defined in Section 6. If the accuracy audit results show the CEMS to be out-of-control, the CEMS operator shall report both the audit results showing the CEMS to be out-of-control and the results of the audit following corrective action showing the CEMS to be operating within specifications.

5. Results from performance audit samples described in Section 5 and the applicable RM's.

6. Summary of all corrective actions taken when CEMS was determined out-of-control, as described in Sections 4 and 5.

An example of a DAR format is shown in Figure 1.

8. Bibliography

1. Calculation and Interpretation of Accuracy for Continuous Emission Monitoring Systems (CEMS). Section 3.0.7 of the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods. EPA–600/4–77–027b. August 1977. U.S. Environmental Protection Agency. Office of Research and Development Publications, 26 West St. Clair Street, Cincinnati, OH 45268.

Figure 1—Example Format for Data Assessment Report

Period ending date _____

Year _____

Company name _____

Plant name _____

Source unit no. _____

CEMS manufacturer _____

Model no. _____

CEMS serial no. _____

CEMS type (e.g., extractive) _____

CEMS sampling location (e.g., control device outlet) _____

CEMS span values as per the applicable regulation:

I. Accuracy assessment results (complete A, B, or C below for each Hg CEMS). If the

quarterly audit results show the Hg CEMS to be out-of-control, report the results of both the quarterly audit and the audit following corrective action showing the Hg CEMS to be operating properly.

A. Relative accuracy test audit (RATA) for ____ (e.g., Hg in µg/m³).

1. Date of audit ____.

2. Reference methods (RM) used ____ (e.g., Method 30B).

3. Average RM value ____ (e.g., µg/m³).

4. Average CEMS value ____.

5. Absolute value of mean difference [d] ____.

6. Confidence coefficient [CC] ____.

7. Percent relative accuracy (RA) ____ percent.

8. Performance audit sample results:

a. Audit lot number (1) ____ (2) ____.

b. Audit sample number (1) ____ (2) ____.

c. Results (µg/m³) (1) ____ (2) ____.

d. Actual value (µg/m³)* (1) ____ (2) ____.

e. Relative error* (1) ____ (2) ____.

B. Cylinder gas audit (GA) for ____ (e.g., Hg in µg/m³).

	Audit point 1	Audit point 2	
1. Date of audit	....	....	
2. Mercury gas generator or cylinder ID number	....	....	
3. Date of certification	....	....	
4. Type of certification	....	....	(e.g., Interim EPA Traceability Protocol for Elemental or Oxidized Mercury Gas Generators).
5. Audit gas value	....	....	(e.g., µg/m³).
6. CEMS response value	....	....	(e.g., µg/m³).
7. Accuracy	....	....	Percent.

C. Relative accuracy audit (RAA) for ____ (e.g., Hg in µg/m³).

1. Date of audit ____.

2. Reference methods (RM) used ____ (e.g., Method 30B).

3. Average RM value ____ (e.g., µg/m³).

4. Average CEMS value ____.

5. Accuracy ____ percent.

6. EPA performance audit results:

a. Audit lot number (1) ____ (2) ____.

b. Audit sample number (1) ____ (2) ____.

c. Results (Hg in µg/m³) (1) ____ (2) ____.

d. Actual value (µg/m³) *(1) ____ (2) ____.

e. Relative error * (1) ____ (2) ____.

* To be completed by the Agency.

D. Corrective action for excessive inaccuracy.

1. Out-of-control periods.

a. Date(s) ____.

b. Number of days ____.

2. Corrective action taken ____.

3. Results of audit following corrective action. (Use format of A, B, or C above, as applicable.)

II. Calibration drift assessment.

A. Out-of-control periods.

1. Date(s) ____.

2. Number of days ____.

B. Corrective action taken ____.

PART 63—[AMENDED]

3. The authority citation for part 63 continues to read as follows:

Authority: 42 U.S.C. 7401, *et seq.*

Subpart LLL—[Amended]

4. Section 63.1340 is amended to read as follows:

a. By revising paragraph (a);

b. By revising paragraphs (b)(1) through (b)(8); and

c. By revising paragraph (c).

§ 63.1340 Applicability and designation of affected sources.

(a) The provisions of this subpart apply to each new and existing portland cement plant which is a major source or an area source as defined in § 63.2.

(b) * * *

(1) Each kiln and each in-line kiln/raw mill, including alkali bypasses, except for kilns and in-line kiln/raw mills that burn hazardous waste and are subject to and regulated under subpart EEE of this part;

(2) Each clinker cooler at any portland cement plant;

(3) Each raw mill at any portland cement plant;

(4) Each finish mill at any portland cement plant;

(5) Each raw material dryer at any portland cement plant;

(6) Each raw material, clinker, or finished product storage bin at any portland cement plant;

(7) Each conveying system transfer point including those associated with coal preparation used to convey coal from the mill to the kiln at any portland cement plant; and

(8) Each bagging and bulk loading and unloading system at any portland cement plant.

(c) Crushers are not covered by this subpart regardless of their location.

* * * * *

5. Section 63.1341 is amended by adding definitions for "Clinker," "Crusher," "New source" and "Total organic HAP" in alphabetic order to read as follows:

§ 63.1341 Definitions.

* * * * *

Clinker means the product of the process in which limestone and other materials are heated in the kiln and is then ground with gypsum and other materials to form cement.

* * * * *

Crusher means a machine designed to reduce large rocks from the quarry into materials approximately the size of gravel.

* * * * *

New source means any source that commences construction after December 2, 2005, for purposes of determining the applicability of the kiln in-line raw mill/kiln, clinker cooler and raw material dryer emissions limits for mercury, THC, and HCl. New source means any source that commences construction after May 6, 2009 for purposes of determining the applicability of the kiln in-line raw mill/kiln AND clinker cooler emissions limits for PM.

* * * * *

Total organic HAP means, for the purposes of this subpart, the sum of the concentrations of compounds of formaldehyde, benzene, toluene, styrene, m-xylene, p-xylene, o-xylene, acetaldehyde, and naphthalene as measured by EPA Test Method 320 of appendix A to this part or ASTM D6348–03. Only the measured concentration of the listed analytes that are present at concentrations exceeding one-half the quantitation limit of the analytical method are to be used in the sum. If any of the analytes are not detected or are detected at concentrations less than one-half the quantitation limit of the analytical method, the concentration of those analytes will be assumed to be zero for the purposes of calculating the total organic HAP for this subpart.

* * * * *

6. Section 63.1343 is amended to read as follows:

a. By revising paragraph (a);

b. By revising paragraph (b) introductory text;

c. By revising paragraph (b)(1);

d. By adding paragraphs (b)(4) through (b)(6);

e. By revising paragraph (c) introductory text;

f. By revising paragraphs (c)(1), (c)(4) and (c)(5);

g. By adding paragraph (c)(6); and

h. By removing paragraphs (d) and (e).

§ 63.1343 Standards for kilns and in-line kiln/raw mills.

(a) *General.* The provisions in this section apply to each kiln, each in-line kiln/raw mill, and any alkali bypass associated with that kiln or in-line kiln/raw mill. All dioxin furan (D/F) and total hydrocarbon (THC) emission limits are on a dry basis, corrected to 7 percent oxygen. The owner/operator shall ensure appropriate corrections for moisture are made when measuring flowrates used to calculate D/F and THC emissions. All (THC) emission limits are measured as propane. Standards for mercury and THC are based on a 30-day rolling average. If using a CEM to determine compliance with the HCl standard, this standard is based on a 30-day rolling average.

(b) *Existing kilns located at major or area sources.* No owner or operator of an existing kiln or an existing in-line kiln/raw mill located at a facility that is subject to the provisions of this subpart shall cause to be discharged into the atmosphere from these affected sources, any gases which:

(1) Contain particulate matter (PM) in excess of 0.085 pounds per ton of clinker. When there is an alkali bypass associated with a kiln or in-line kiln/raw mill, the combined PM emissions from the kiln or in-line kiln/raw mill and the alkali bypass stack are subject to this emission limit. Kiln, or in-line kiln/raw mills that combine the clinker cooler exhaust with the kiln exhaust for energy efficiency purposes and send the combined exhaust to the PM control device as a single stream may meet an alternative PM emissions limit. This limit is calculated using the following equation:

$$PM_{alt} = 0.0067 \times 1.65 \times \left(Q_k + Q_c \right) / 7000 \qquad \text{(Eq. 1)}$$

Where: 0.0067 is the PM exhaust concentration equivalent to 0.085 lb per ton clinker where clinker cooler and kiln exhaust gas are not combined.

Q_k is the exhaust flow of the kiln (dscf/ton raw feed)

Q_c is the exhaust flow of the clinker cooler (dscf/ton raw feed)

* * * * *

(4) Contain THC in excess of 7 ppmv or total organic HAP in excess of 2 ppmv from the main exhaust of the kiln or in-line kiln/raw mill. If a source elects to demonstrate compliance with the total organic HAP limit in lieu of the THC limit, then they may meet a site specific THC limit based on a 30-day average and on the level of THC measured during the performance test demonstrating compliance with the organic HAP limit.

(5) Contain mercury (Hg) in excess of 43 lb per million tons of clinker. When there is an alkali bypass associated with a kiln or in-line kiln/raw mill, the combined Hg emissions from the kiln or in-line kiln/raw mill and the alkali bypass are subject to this emission limit.

(6) Contain hydrogen chloride (HCl) in excess of 2 ppmv from the main exhaust of the kiln or in-line kiln/raw mill if the kiln or in-line kiln/raw mill is located at a major source of HAP emissions.

(c) *New or reconstructed kilns located at major or area sources.* No owner or operator of a new or reconstructed kiln or new or reconstructed inline kiln/raw mill located at a facility subject to the provisions of this subpart shall cause to be discharged into the atmosphere from these affected sources any gases which:

(1) Contain PM in excess of 0.080 pounds per ton of clinker. When there is an alkali bypass associated with a kiln or in-line kiln/raw mill, the combined PM emissions from the kiln or in-line kiln/raw mill and the alkali bypass stack are subject to this emission limit. Kiln, or in-line kiln/raw mills that combine the clinker cooler exhaust with the kiln exhaust for energy efficiency purposes and send the combined exhaust to the PM control device as a single stream may meet an alternative PM emissions limit. This limit is calculated using the following equation:

$$PM_{alt} = 0.0063 \times 1.65 \times \left(Q_k + Q_c \right) / 7000 \qquad \text{(Eq. 2)}$$

Where: 0.0063 is the PM exhaust concentration equivalent to 0.080 lb per ton clinker where clinker cooler and kiln exhaust gas are not combined.

Q_k is the exhaust flow of the kiln (dscf/ton raw feed)

Q_c is the exhaust flow of the clinker cooler (dscf/ton raw feed)

* * * * *

(4) Contain THC in excess of 6 ppmv, or total organic HAP in excess of 1 ppmv, from the main exhaust of the kiln, or main exhaust of the in-line kiln/raw mill. If a source elects to demonstrate compliance with the total organic HAP limit in lieu of the THC limit, then they may meet a site specific THC limit based a 30-day average and the on the level of THC measured during the performance test demonstrating compliance with the organic HAP limit.

(5) Contain Hg from the main exhaust of the kiln, or main exhaust of the in-line kiln/raw mill, in excess of 14 lb/ million tons of clinker. When there is an alkali bypass associated with a kiln, or in-line kiln/raw mill, the combined Hg emissions from the kiln or in-line kiln/ raw mill and the alkali bypass are subject to this emission limit.

(6) Contain HCl in excess of 0.1 ppmv from the main exhaust of the kiln, or main exhaust of the in-line kiln/raw mill if the kiln or in-line kiln/raw mill is located at a major source of HAP emissions.

7. Section 63.1344 is amended to read as follows:

a. By revising paragraph (c) introductory text,

b. By revising paragraphs (d) and (e); and

c. By removing paragraphs (f), (g), (h) and (i).

§ 63.1344 Operating limits for kilns and in-line kiln/raw mills.

* * * * *

(c) The owner or operator of an affected source subject to a D/F emission limitation under § 63.1343 that employs carbon injection as an emission control technique must operate the carbon injection system in accordance with paragraphs (c)(1) and (c)(2) of this section.

* * * * *

(d) Except as provided in paragraph (e) of this section, the owner or operator of an affected source subject to a D/F emission limitation under § 63.1343 that employs carbon injection as an emission control technique must specify and use

the brand and type of activated carbon used during the performance test until a subsequent performance test is conducted, unless the site-specific performance test plan contains documentation of key parameters that affect adsorption and the owner or operator establishes limits based on those parameters, and the limits on these parameters are maintained.

(e) The owner or operator of an affected source subject to a D/F emission limitation under § 63.1343 that employs carbon injection as an emission control technique may substitute, at any time, a different brand or type of activated carbon provided that the replacement has equivalent or improved properties compared to the activated carbon specified in the site-specific performance test plan and used in the performance test. The owner or operator must maintain documentation that the substitute activated carbon will provide the same or better level of control as the original activated carbon.

8. Section 63.1345 is amended by revising paragraph (a) introductory text and paragraph (a)(1) to read as follows:

§ 63.1345 Standards for clinker coolers.

(a) No owner or operator of a new or existing clinker cooler at a facility which is a major source or an area source subject to the provision of this subpart shall cause to be discharged into the atmosphere from the clinker cooler any gases which:

(1) Contain PM in excess of 0.085 lb per ton of clinker for existing sources or 0.080 lb per ton of clinker for new sources.

* * * * *

9. Section 63.1346 is revised to read as follows:

§ 63.1346 Standards for raw material dryers.

(a) Raw material dryers that are located at facilities that are major sources can not discharge to the atmosphere any gases which:

(1) Exhibit opacity greater then 10 percent; or

(2) Contain THC in excess of 7 ppmv (existing sources) or 6 ppmv (new sources), on a dry basis as propane corrected to 7 percent oxygen based on a 30-day rolling average

(b) Raw Material dryers located at a facility that is an area source must not discharge to the atmosphere any gases which contain THC in excess of 7 ppmv (existing sources) or 6 ppmv (new

sources), on a dry basis as propane corrected to 7 percent oxygen based on a 30-day rolling average. If a source elects to demonstrate compliance with the total organic HAP limit in lieu of the THC limit, then they may meet a site specific THC limit based on a 30-day average and on the level of THC measured during the performance test demonstrating compliance with the organic HAP limit.

10. Section 63.1349 is amended to read as follows:

a. By revising paragraph (b) introductory text;

b. By revising paragraphs (b)(1) introductory text, (b)(1)(ii), (iii), (iv) and (vi);

c. By revising paragraphs (b)(3)(iii) and (v), (b)(4) and (b)(5);

d. By adding paragraph (b)(6);

e. By revising paragraph (c); and

f. By adding paragraphs (f) and (g).

§ 63.1349 Performance testing requirements.

* * * * *

(b) Performance tests to demonstrate initial compliance with this subpart shall be conducted as specified in paragraphs (b)(1) through (b)(6) of this section.

(1) The owner or operator of a kiln subject to limitations on PM emissions that is not equipped with a PM CEMS shall demonstrate initial compliance by conducting a performance test as specified in paragraphs (b)(1)(i) through (b)(1)(iv) of this section. The owner or operator of an in-line kiln/raw mill subject to limitations on PM emissions that is not equipped with a PM CEMS shall demonstrate initial compliance by conducting separate performance tests as specified in paragraphs (b)(1)(i) through (b)(1)(iv) of this section while the raw mill of the in-line kiln/raw mill is under normal operating conditions and while the raw mill of the in-line kiln/raw mill is not operating. The owner or operator of a clinker cooler subject to limitations on PM emissions shall demonstrate initial compliance by conducting a performance test as specified in paragraphs (b)(1)(i) through (b)(1)(iii) of this section. The owner or operator shall determine the opacity of PM emissions exhibited during the period of the Method 5 (40 CFR part 60, appendix A–3) performance tests required by paragraph (b)(1)(i) of this section as required in paragraphs (b)(1)(v) through (vi) of this section. The owner or operator of a kiln or in-line

kiln/raw mill subject to limitations on PM emissions that is equipped with a PM CEMS shall demonstrate initial compliance by conducting a performance test as specified in paragraph (b)(1)(vi) of this section.

* * * * *

(ii) The owner or operator must install, calibrate, maintain and operate a permanent weigh scale system, or use another method approved by the Administrator, to measure and record weight rates in tons-mass per hour of the amount of clinker produced. The system of measuring hourly clinker production must be maintained within ±5 percent accuracy. The owner or operator shall determine, record, and maintain a record of the accuracy of the system of measuring hourly clinker production before initial use (for new sources) or within 30 days of the effective date of this rule (for existing sources). During each quarter of source operation, the owner or operator shall determine, record, and maintain a record of the ongoing accuracy of the system of measuring hourly clinker production. The use of a system that directly measures kiln feed rate and uses a conversion factor to determine the clinker production rate is an acceptable method.

(iii) The emission rate, E, of PM (lb/ton of clinker) shall be computed for each run using equation 3 of this section:

$$E = \frac{(C_s Q_{sd})}{(PK)} \qquad \text{(Eq. 3)}$$

Where:

E = emission rate of particulate matter, kg/metric ton (lb/ton) of clinker production;

C_s = concentration of particulate matter, g/dscm (gr/dscf);

Q_{sd} = volumetric flow rate of effluent gas, dscm/hr (dscf/hr);

P = total kiln clinker production rate, metric ton/hr (ton/hr); and

K = conversion factor, 1000 g/kg (7000 gr/lb).

(iv) Where there is an alkali bypass associated with a kiln or in-line kiln/raw mill, the main exhaust and alkali bypass of the kiln or in-line kiln/raw mill shall be tested simultaneously and the combined emission rate of particulate matter from the kiln or in-line raw mill and alkali bypass shall be computed for each run using equation 4 of this section:

$$E_c = \frac{(C_{sk} Q_{sdk} + C_{sb} Q_{sdb})}{(PK)} \qquad \text{(Eq. 4)}$$

Where:

E_c = combined emission rate of particulate matter from the kiln or in-line kiln/raw mill and bypass stack, kg/metric ton (lb/ton) of kiln clinker production;

C_{sk} = concentration of particulate matter in the kiln or in-line kiln/raw mill effluent gas, g/dscm (gr/dscf);

Q_{sdk} = volumetric flow rate of kiln or in-line kiln/raw mill effluent gas, dscm/hr (dscf/hr);

C_{sb} = concentration of particulate matter in the alkali bypass gas, g/dscm (gr/dscf);

Q_{sdb} = volumetric flow rate of alkali bypass effluent gas, dscm/hr (dscf/hr);

P = total kiln clinker production rate, metric ton/hr (ton/hr); and

K = conversion factor, 1000 g/kg (7000 gr/lb).

* * * * *

(vi) The owner or operator of a kiln or in-line kiln/raw mill subject to limitations on emissions of PM that is equipped with a PM CEMS shall install, operate, calibrate, and maintain the PM CEMS in accordance with Performance Specification 11 (40 CFR part 60, appendix B). Compliance with the PM emissions standard shall be determined by calculating the average of 3 hourly average PM emission rates in lb/ton of clinker using Equation 3 or 4 of this section. The owner or operator of an in-line kiln/raw mill shall conduct separate performance tests while the raw mill of the in-line kiln/raw mill is under normal operating conditions and while the raw mill of the in-line kiln/raw mill is not operating. The owner or operator shall continuously measure kiln feed rate, volumetric flow rate, and clinker production during the period of the test. The owner or operator shall determine, record, and maintain a record of the accuracy of the volumetric flow rate monitoring system according to the procedures in appendix A to part 75 of this chapter.

* * * * *

(3) * * *

(iii) Hourly average temperatures must be calculated for each run of the test.

* * * * *

(v) If activated carbon injection is used for D/F control, the rate of activated carbon injection to the kiln or in-line kiln/raw mill exhaust, and where applicable, the rate of activated carbon injection to the alkali bypass exhaust, must be continuously recorded during the period of the Method 23 test, and the continuous injection rate record(s) must be included in the performance test report. In addition, the performance test report must include the brand and type of activated carbon used during the performance test and a continuous record of either the carrier gas flow rate or the carrier gas pressure drop for the duration of the test. The system of measuring carrier gas flow rate or carrier gas pressure drop must be maintained within +/- 5 percent accuracy. If the carrier gas flow rate is used, the owner or operator shall determine, record, and maintain a record of the accuracy of the carrier gas flow rate monitoring system according to the procedures in appendix A to part 75 of this chapter. If the carrier gas pressure drop is used, the owner or operator shall determine, record, and maintain a record of the accuracy of the carrier gas pressure drop monitoring system according to the procedures in appendix A to part 75 of this chapter. Activated carbon injection rate parameters must be determined in accordance with paragraphs (b)(3)(vi) of this section.

* * * * *

(4)(i) The owner or operator of an affected source subject to limitations on emissions of THC shall demonstrate initial compliance with the THC limit by operating a continuous emission monitor in accordance with Performance Specification 8A (40 CFR part 60, appendix B). The duration of the performance test shall be 24 hours. The owner or operator shall calculate the daily average THC concentration (as calculated from the hourly averages obtained during the performance test). The owner or operator of an in-line kiln/raw mill shall demonstrate initial compliance by conducting separate performance tests while the raw mill of the in-line kiln/raw mill is under normal operating conditions and while the raw mill of the in-line kiln/raw mill is not operating.

(ii) As an alternative to complying with the THC limit, the owner or operator may comply with the limits for total organic HAP, as defined in § 63.1341, by following the procedures in (b)(4)(ii) through (b)(4)(vi) of this section.

(iii) The owner or operator of a kiln complying with the alternative emissions limits for total organic HAP in § 63.1343 shall demonstrate initial compliance by conducting a performance test as specified in paragraphs (b)(4)(ii) through (b)(4)(vi) of this section. The owner or operator of an in-line kiln/raw mill complying with the emissions limits for total organic HAP in § 63.1343 shall demonstrate initial compliance by conducting separate performance tests as specified in paragraphs (b)(4)(ii) through (b)(4)(vi) of this section while the raw mill of the in-line kiln/raw mill is under normal operating conditions and while the raw mill of the in-line kiln/raw mill is not operating.

(iv) Method 320 of appendix A to this part or ASTM D6348–03 shall be used to determine emissions of total organic HAP. Each performance test shall consist of three separate runs under the conditions that exist when the affected source is operating at the representative performance conditions in accordance with § 63.7(e). Each run shall be conducted for at least 1 hour. The average of the three runs shall be used to determine initial compliance. The owner or operator shall determine, record, and maintain a record of the accuracy of the volumetric flow rate monitoring system according to the procedures in appendix A to part 75 of this chapter.

(v) At the same time that the owner or operator is determining compliance with the emissions limits for total organic HAP, the owner or operator shall also determine THC emissions by operating a continuous emission monitor in accordance with Performance Specification 8A of appendix B to part 60 of this chapter. The duration of the test shall be 3 hours, and the average THC concentration (as calculated from the 1-minute averages) during the 3-hour test shall be calculated. The THC concentration measured during the initial performance test for total organic HAP will be used to monitor compliance subsequent to the initial performance test.

(vi) Emissions tests to determine compliance with total inorganic HAP limits shall be repeated annually, beginning 1 year from the date of the initial performance tests.

(5) The owner or operator of a kiln or in-line kiln/raw mill subject to an emission limitation for mercury in § 63.1343 shall demonstrate initial compliance with the mercury limit by complying with the requirements of (b)(5)(i) through (b)(5)(vi) of this section.

(i) Operate a continuous emission monitor in accordance with Performance Specification 12A of 40 CFR part 60, appendix B or a sorbent trap based integrated monitor in accordance with Performance Specification 12B of 40 CFR part 60, appendix B. The duration of the performance test shall be a calendar month. For each calendar month in which the kiln or in-line kiln/raw mill operates, hourly mercury concentration data, stack gas volumetric flow rate data shall be obtained. The owner or operator shall determine, record, and maintain a record of the accuracy of the volumetric flow rate monitoring system according to the procedures in appendix A to part 75 of this chapter. The owner or operator of an in-line kiln/raw mill shall demonstrate initial compliance by

operating a continuous emission monitor while the raw mill of the in-line kiln/raw mill is under normal operating conditions and while the raw mill of the in-line kiln/raw mill is not operating.

(ii) Owners or operators using a mercury CEMS must install, operate, calibrate, and maintain an instrument for continuously measuring and recording the exhaust gas flow rate to the atmosphere according to the requirements in § 60.63(m) of this chapter.

$$E = \frac{(C_s Q_{sd})}{(PK)} \qquad \text{(Eq. 5)}$$

Where:

E = emission rate of mercury, kg/metric ton (lb/million tons) of clinker production;
C_s = concentration of mercury, g/dscm (g/dscf);
Q_{sd} = volumetric flow rate of effluent gas, dscm/hr (dscf/hr);
P = total kiln clinker production rate, metric ton/hr (million ton/hr); and
K = conversion factor, 1000 g/kg (454 g/lb).

(6) The owner or operator of an affected source subject to limitations on emissions of HCl shall demonstrate initial compliance with the HCl limit by one of the following methods:

(i) If your source is equipped with a wet scrubber such as a spray tower, packed bed, or tray tower, use Method 321 of appendix A to this part. A repeat test must be performed every 5 years to demonstrate continued compliance.

(ii) If your source is not controlled by a wet scrubber, you must operate a continuous emission monitor in accordance with Performance Specification 15 of appendix B of part 60. The duration of the performance test shall be 24 hours. The owner or operator shall calculate the daily average HCl concentration (as calculated from the hourly averages obtained during the performance test). The owner or operator of an in-line kiln/raw mill shall demonstrate initial compliance by conducting separate performance tests while the raw mill of the in-line kiln/raw mill is under normal operating conditions and while the raw mill of the in-line kiln/raw mill is not operating.

(c) Except as provided in paragraph (e) of this section, performance tests are required for existing kilns or in-line kiln/raw mills that are subject to a PM, THC, HCl or mercury emissions limit and must be repeated every 5 years except for pollutants where that specific pollutant is monitored using a CEMS.

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(f) The owner or operator of an affected facility shall submit the information specified in paragraphs (c)(1) through (c)(4) of this section no later than 60 days following the initial performance test. All reports shall be signed by the facilities manager.

(1) The initial performance test data as recorded under § 60.56c(b)(1) through (b)(14), as applicable.

(2) The values for the site-specific operating parameters established pursuant to § 60.56c(d), (h), or (j), as applicable, and a description, including sample calculations, of how the operating parameters were established during the initial performance test.

(3) For each affected facility as defined in § 60.50c(a)(3).

(4) That uses a bag leak detection system, analysis and supporting documentation demonstrating conformance with EPA guidance and specifications for bag leak detection systems in § 60.57c(h).

(g) For affected facilities, as defined in § 60.50c(a)(3) and (4), that choose to submit an electronic copy of stack test reports to EPA's WebFIRE data base, as of December 31, 2011, the owner or operator of an affected facility shall enter the test data into EPA's data base using the Electronic Reporting Tool located at *http://www.epa.gov/ttn/chief/ert/ert_tool.html.*

11. Section 63.1350 is amended to read as follows:

a. By revising paragraph (a)(4)(i), (a)(4)(iv), (a)(4)(vi) and (vii);

b. By revising paragraph (c)(1) and (2) introductory text;

c. By revising paragraph (d)(1) and (2) introductory text;

d. By revising paragraph (e) introductory text;

e. By revising paragraph (g) introductory text;

f. By revising paragraph (h) introductory text;

g. By revising paragraph (h)(2) through (h)(4);

h. By revising paragraph (k);

i. By revising paragraphs (m) introductory text;

j. By revising paragraphs (n),(o) and (p); and

k. By adding paragraphs (q) and (r).

§ 63.1350 Monitoring requirements.

(a) * * *

(4) * * *

(i) The owner or operator must conduct a monthly 20-minute visible emissions test of each affected source in accordance with Method 22 of appendix A–7 to part 60 of this chapter. The test must be conducted while the affected source is in operation.

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(iv) If visible emissions are observed during any Method 22 test, of appendix A–7 to part 60, the owner or operator must conduct five 6-minute averages of opacity in accordance with Method 9 of appendix A–4 to part 60 of this chapter. The Method 9 test, of appendix A–4 to part 60, must begin within 1 hour of any observation of visible emissions.

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(vi) If any partially enclosed or unenclosed conveying system transfer point is located in a building, the owner or operator of the portland cement plant shall have the option to conduct a Method 22 test, of appendix A–7 to part 60, according to the requirements of paragraphs (a)(4)(i) through (iv) of this section for each such conveying system transfer point located within the building, or for the building itself, according to paragraph (a)(4)(vii) of this section.

(vii) If visible emissions from a building are monitored, the requirements of paragraphs (a)(4)(i) through (iv) of this section apply to the monitoring of the building, and you must also test visible emissions from each side, roof and vent of the building for at least 20 minutes. The test must be conducted under normal operating conditions.

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(c) * * *

(1) Except as provided in paragraph (c)(2) of this section, the owner or operator shall install, calibrate, maintain, and continuously operate a continuous opacity monitoring system (COMS) located at the outlet of the PM control device to continuously monitor the opacity. The COMS shall be installed, maintained, calibrated, and operated as required by subpart A, general provisions of this part, and according to PS–1 of appendix B to part 60 of this chapter.

(iii) The owner or operator shall determine compliance with the mercury limitations by dividing the average mercury concentration by the clinker production rate during the same calendar month using the Equation 3 of this section:

(2) The owner or operator of a kiln or in-line kiln/raw mill subject to the provisions of this subpart using a fabric filter with multiple stacks or an electrostatic precipitator with multiple stacks may, in lieu of installing the continuous opacity monitoring system required by paragraph (c)(1) of this section, monitor opacity in accordance with paragraphs (c)(2)(i) through (ii) of this section. If the control device exhausts through a monovent, or if the use of a COMS in accordance with the installation specifications of PS–1 of appendix B to part 60 of this chapter is not feasible, the owner or operator must monitor opacity in accordance with paragraphs (c)(2)(i) through (ii) of this section.

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(d)(1) Except as provided in paragraph (d)(2) of this section, the owner or operator shall install, calibrate, maintain, and continuously operate a COMS located at the outlet of the clinker cooler PM control device to continuously monitor the opacity. The COMS shall be installed, maintained, calibrated, and operated as required by subpart A, general provisions of this part, and according to PS–1 of appendix B to part 60 of this chapter.

(2) The owner or operator of a clinker cooler subject to the provisions of this subpart using a fabric filter with multiple stacks or an electrostatic precipitator with multiple stacks may, in lieu of installing the continuous opacity monitoring system required by paragraph (d)(1) of this section, monitor opacity in accordance with paragraphs (d)(2)(i) through (ii) of this section. If the control device exhausts through a monovent, or if the use of a COMS in accordance with the installation specifications of PS–1 of appendix B to part 60 of this chapter is not feasible, the owner or operator must monitor opacity in accordance with paragraphs (d)(2)(i) through (ii) of this section.

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(e) The owner or operator of a raw mill or finish mill shall monitor opacity by conducting daily visual emissions observations of the mill sweep and air separator PMCD of these affected sources in accordance with the procedures of Method 22 of appendix A–7 to part 60 of this chapter. The Method 22 test, of appendix A–7 to part 60, shall be conducted while the affected source is operating at the representative performance conditions. The duration of the Method 22 test, of appendix A–7 to part 60, shall be 6 minutes. If visible emissions are observed during any Method 22 test, of

appendix A–7 to part 60, the owner or operator must:

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(g) The owner or operator of an affected source subject to an emissions limitation on D/F emissions that employs carbon injection as an emission control technique shall comply with the monitoring requirements of paragraphs (f)(1) through (f)(6) and (g)(1) through (g)(6) of this section to demonstrate continuous compliance with the D/F emissions standard.

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(h) The owner or operator of an affected source subject to a limitation on THC emissions under this subpart shall comply with the monitoring requirements of paragraphs (h)(1) through (h)(3) of this section to demonstrate continuous compliance with the THC emission standard:

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(2) For existing facilities complying with the THC emissions limits of § 63.1343, the 30-day average THC concentration in any gas discharged from the main exhaust of a kiln, or in-line kiln/raw mill, must not exceed their THC emissions limit, reported as propane, corrected to seven percent oxygen.

(3) For new or reconstructed facilities complying with the THC emission limits of § 63.1343, the 30-day average THC concentration in any gas discharged from the main exhaust of a kiln or in-line kiln/raw mill must not exceed their THC emission limit, reported as propane, corrected to 7 percent oxygen.

(4) For new or reconstructed facilities complying with the THC emission limits of § 63.1346, any daily average THC concentration in any gas discharged from a raw material dryer must not exceed their THC emission limit, reported as propane, corrected to 7 percent oxygen.

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(k) The owner or operator of an affected source subject to a particulate matter standard under § 63.1343 using a fabric filter for PM control must install, operate, and maintain a bag leak detection system according to paragraphs (k)(1) through (k)(3) of this section.

(1) Each bag leak detection system must meet the specifications and requirements in paragraphs (k)(1)(i) through (k)(1)(viii) of this section.

(i) The bag leak detection system must be certified by the manufacturer to be capable of detecting PM emissions at concentrations of 1 milligram per dry standard cubic meter (0.00044 grains per actual cubic foot) or less.

(ii) The bag leak detection system sensor must provide output of relative PM loadings. The owner or operator shall continuously record the output from the bag leak detection system using electronic or other means (e.g., using a strip chart recorder or a data logger).

(iii) The bag leak detection system must be equipped with an alarm system that will sound when the system detects an increase in relative particulate loading over the alarm set point established according to paragraph (k)(1)(iv) of this section, and the alarm must be located such that it can be heard by the appropriate plant personnel.

(iv) In the initial adjustment of the bag leak detection system, you must establish, at a minimum, the baseline output by adjusting the sensitivity (range) and the averaging period of the device, the alarm set points, and the alarm delay time.

(v) Following initial adjustment, you shall not adjust the averaging period, alarm set point, or alarm delay time without approval from the Administrator or delegated authority except as provided in paragraph (k)(1)(vi) of this section.

(vi) Once per quarter, you may adjust the sensitivity of the bag leak detection system to account for seasonal effects, including temperature and humidity, according to the procedures identified in the site-specific monitoring plan required by paragraph (k)(2) of this section.

(vii) You must install the bag leak detection sensor downstream of the fabric filter.

(viii) Where multiple detectors are required, the system's instrumentation and alarm may be shared among detectors.

(2) You must develop and submit to the Administrator or delegated authority for approval a site-specific monitoring plan for each bag leak detection system. You must operate and maintain the bag leak detection system according to the site-specific monitoring plan at all times. Each monitoring plan must describe the items in paragraphs (k)(2)(i) through (k)(2)(vi) of this section. At a minimum you must retain records related to the site-specific monitoring plan and information discussed in paragraphs (k)(2)(i) through (k)(2)(vi) of this section for a period of 2 years on-site and 3 years off-site;

(i) Installation of the bag leak detection system;

(ii) Initial and periodic adjustment of the bag leak detection system, including how the alarm set-point will be established;

(iii) Operation of the bag leak detection system, including quality assurance procedures;

(iv) How the bag leak detection system will be maintained, including a routine maintenance schedule and spare parts inventory list;

(v) How the bag leak detection system output will be recorded and stored; and

(vi) Corrective action procedures as specified in paragraph (k)(3) of this section. In approving the site-specific monitoring plan, the Administrator or delegated authority may allow owners and operators more than 3 hours to alleviate a specific condition that causes an alarm if the owner or operator identifies in the monitoring plan this specific condition as one that could lead to an alarm, adequately explains why it is not feasible to alleviate this condition within 3 hours of the time the alarm occurs, and demonstrates that the requested time will ensure alleviation of this condition as expeditiously as practicable.

(3) For each bag leak detection system, you must initiate procedures to determine the cause of every alarm within 1 hour of the alarm. Except as provided in paragraph (k)(2)(vi) of this section, you must alleviate the cause of the alarm within 3 hours of the alarm by taking whatever corrective action(s) are necessary. Corrective actions may include, but are not limited to the following:

(i) Inspecting the fabric filter for air leaks, torn or broken bags or filter media, or any other condition that may cause an increase in PM emissions;

(ii) Sealing off defective bags or filter media;

(iii) Replacing defective bags or filter media or otherwise repairing the control device;

(iv) Sealing off a defective fabric filter compartment;

(v) Cleaning the bag leak detection system probe or otherwise repairing the bag leak detection system; or

(vi) Shutting down the process producing the PM emissions.

(4) The owner or operator of a kiln or clinker cooler using a PM continuous emission monitoring system (CEMS) to demonstrate compliance with the particulate matter emission limit in § 63.1343 must install, certify, operate, and maintain the CEMS as specified in paragraphs (p)(1) through (p)(3) of this section.

* * * * *

(m) The requirements under paragraph (e) of this section to conduct daily Method 22 testing shall not apply to any specific raw mill or finish mill equipped with a continuous opacity monitoring system (COMS) or bag leak detection system (BLDS). If the owner or operator chooses to install a COMS in lieu of conducting the daily visual emissions testing required under paragraph (e) of this section, then the COMS must be installed at the outlet of the PM control device of the raw mill or finish mill, and the COMS must be installed, maintained, calibrated, and operated as required by the general provisions in subpart A of this part and according to PS–1 of appendix B to part 60 of this chapter. The 6-minute average opacity for any 6-minute block period must not exceed 10 percent. If the owner or operator chooses to install a BLDS in lieu of conducting the daily visual emissions testing required under paragraph (e) of this section, the requirements in paragraphs (k)(1) through (k)(3) of this section apply to each BLDS.

* * * * *

(n) The owner or operator of a kiln or in-line kiln raw mill shall install and operate a continuous emissions monitor in accordance with Performance Specification 12A of 40 CFR part 60, appendix B or a sorbent trap-based integrated monitor in accordance with Performance Specification 12B of 40 CFR part 60, appendix B. The owner or operator shall operate and maintain each CEMS according to the quality assurance requirements in Procedure 4 of 40 CFR part 60, appendix F.

(o) The owner or operator of any portland cement plant subject to the PM limit (lb/ton of clinker) for new or existing sources in § 63.1343(b) or (c) shall:

(1) Install, calibrate, maintain and operate a permanent weigh scale system, or use another method approved by the Administrator, to measure and record weight rates in tons–mass per hour of the amount of clinker produced. The system of measuring hourly clinker production must be maintained within ±5 percent accuracy. The owner or operator shall determine, record, and maintain a record of the accuracy of the system of measuring hourly clinker production before initial use (for new sources) or within 30 days of the effective date of this rule (for existing sources). During each quarter of source operation, the owner or operator shall determine, record, and maintain a record of the ongoing accuracy of the system of measuring hourly clinker production. The use of a system that directly measures kiln feed rate and uses a conversion factor to determine the clinker production rate is an acceptable method.

(2) Record the daily clinker production rates and kiln feed rates.

(p) The owner or operator of a kiln or clinker cooler using a PM continuous emission monitoring system (CEMS) to demonstrate compliance with the particulate matter emission limit in § 63.1343 or § 63.1345 must install, certify, operate, and maintain the CEMS as specified in paragraphs (p)(1) through (p)(3) of this section.

(1) The owner or operator must conduct a performance evaluation of the PM CEMS according to the applicable requirements of § 60.13, Performance Specification 11 of appendix B of part 60, and Procedure 2 of appendix F to part 60.

(2) During each relative accuracy test run of the CEMS required by Performance Specification 11 of appendix B to part 60, PM and oxygen (or carbon dioxide) data must be collected concurrently (or within a 30- to 60-minute period) during operation of the CEMS and when conducting performance tests using the following test methods:

(i) For PM, Method 5 or 5B of appendix A–5 to part 60 or Method 17 of appendix A–6 to part 60.

(ii) For oxygen (or carbon dioxide), Method 3, 3A, or 3B of appendix A–2 to part 60, as applicable.

(3) Procedure 2 of appendix F to part 60 for quarterly accuracy determinations and daily calibration drift tests. The owner or operator must perform Relative Response Audits annually and Response Correlation Audits every 3 years.

(q) The owner or operator of an affected source subject to limitations on emissions of HCl shall:

(1) Continuously monitor compliance with the HCl limit by operating a continuous emission monitor in accordance with Performance Specification 15 of part 60, appendix B. The owner or operator shall operate and maintain each CEMS according to the quality assurance requirements in Procedure 1 of 40 CFR part 60, appendix F, or

(2) Monitor your wet scrubber parameters as specified in 40 CFR part 63, subpart SS.

(r) The owner or operator complying with the total organic HAP emissions limits of § 63.1343 shall continuously monitor THC according to paragraphs (r)(1) through (r)(2) of this section to demonstrate continuous compliance with the emission limits for total organic HAP.

(1) Install, operate and maintain a THC continuous emission monitoring system in accordance with Performance Specification 8A, of appendix B to part

60 of this chapter and comply with all of the requirements for continuous monitoring found in the general provisions, subpart A of the part. The owner or operator shall operate and maintain each CEMS according to the quality assurance requirements in Procedure 1 of 40 CFR part 60, appendix F.

(2) Calculate the 3-hour average THC concentration as the average of three successive 1-hour average THC readings. The 3-hour average THC concentration shall not exceed the average THC concentration established during the initial performance tests for total organic HAP.

12. Section 63.1351 is amended by revising paragraph (d) and adding paragraphs (e) and (f) to read as follows:

§ 63.1351 Compliance dates.

* * * * *

(d) The compliance date for a new source which commenced construction after December 2, 2005, and before December 20, 2006 to meet the THC emission limit of 6 ppmvd or the mercury standard of 14 lb/MM tons clinker will be December 21, 2009, or the effective date of these amendments, whichever is later.

(e) The compliance data for existing sources with the revised PM, mercury, THC, and HCl emissions limits will be 3 years from the effective data of these amendments.

(f) The compliance date for new sources not subject to paragraph (d) of this section will be the effective date of the final rule or startup, whichever is later.

13. Section 63.1354 is amended by adding paragraph (b)(9)(vi) to read as follows:

§ 63.1354 Reporting requirements.

* * * * *

(b)(9) * * *

(vi) Monthly rolling average mercury concentration for each kiln and in-line kiln/raw mill.

* * * * *

14. Section 63.1355 is amended by revising paragraph (e) to read as follows:

§ 63.1355 Recordkeeping requirements.

* * * * *

(e) You must keep records of the daily clinker production rates and kiln feed rates for area sources.

* * * * *

15. Section 63.1356 is revised to read as follows:

§ 63.1356 Sources with multiple emission limits or monitoring requirements.

If an affected facility subject to this subpart has a different emission limit or requirement for the same pollutant under another regulation in title 40 of this chapter, the owner or operator of the affected facility must comply with the most stringent emission limit or requirement and is exempt from the less stringent requirement.

16. Table 1 to Subpart LLL of Part 63 is revised to read as follows:

TABLE 1 TO SUBPART LLL OF PART 63—APPLICABILITY OF GENERAL PROVISIONS

Citation	Requirement	Applies to subpart LLL	Explanation
63.1(a)(1)–(4)	Applicability	Yes.	
63.1(a)(5)		No	[Reserved].
63.1(a)(6)–(8)	Applicability	Yes.	
63.1(a)(9)		No	[Reserved].
63.1(a)(10)–(14)	Applicability	Yes.	
63.1(b)(1)	Initial Applicability Determination	No	§ 63.1340 specifies applicability.
63.1(b)(2)–(3)	Initial Applicability Determination	Yes.	
63.1(c)(1)	Applicability After Standard Established.	Yes.	
63.1(c)(2)	Permit Requirements	Yes	Area sources must obtain Title V permits.
63.1(c)(3)		No	[Reserved].
63.1(c)(4)–(5)	Extensions, Notifications	Yes.	
63.1(d)		No	[Reserved].
63.1(e)	Applicability of Permit Program	Yes.	
63.2	Definitions	Yes	Additional definitions in § 63.1341.
63.3(a)–(c)	Units and Abbreviations	Yes.	
63.4(a)(1)–(3)	Prohibited Activities	Yes.	
63.4(a)(4)		No	[Reserved].
63.4(a)(5)	Compliance date	Yes.	
63.4(b)–(c)	Circumvention, Severability	Yes.	
63.5(a)(1)–(2)	Construction/Reconstruction	Yes.	
63.5(b)(1)	Compliance Dates	Yes.	
63.5(b)(2)		No	[Reserved].
63.5(b)(3)–(6)	Construction Approval, Applicability	Yes.	
63.5(c)		No	[Reserved].
63.5(d)(1)–(4)	Approval of Construction/Reconstruction.	Yes.	
63.5(e)	Approval of Construction/Reconstruction.	Yes.	
63.5(f)(1)–(2)	Approval of Construction/Reconstruction.	Yes.	
63.6(a)	Compliance for Standards and Maintenance.	Yes.	
63.6(b)(1)–(5)	Compliance Dates	Yes.	
63.6(b)(6)		No	[Reserved].
63.6(b)(7)	Compliance Dates	Yes.	
63.6(c)(1)–(2)	Compliance Dates	Yes.	
63.6(c)(3)–(4)		No	[Reserved].
63.6(c)(5)	Compliance Dates	Yes.	
63.6(d)		No	[Reserved].

TABLE 1 TO SUBPART LLL OF PART 63—APPLICABILITY OF GENERAL PROVISIONS—Continued

Citation	Requirement	Applies to subpart LLL	Explanation
63.6(e)(1)–(2)	Operation & Maintenance	Yes.	
63.6(e)(3)	Startup, Shutdown Malfunction Plan	Yes.	
63.6(f)(1)	Compliance with Emission Standards	No.	
63.6(f)(2)–(3)	Compliance with Emission Standards	Yes.	
63.6(g)(1)–(3)	Alternative Standard	Yes.	
63.6(h)(1)	Opacity/VE Standards	No.	
63.6(h)(2)	Opacity/VE Standards	Yes.	
63.6(h)(3)		No	[Reserved].
63.6(h)(4)–(h)(5)(i)	Opacity/VE Standards	Yes.	
63.6(h)(5)(ii)–(iv)	Opacity/VE Standards	No	Test duration specified in subpart LLL.
63.6(h)(6)	Opacity/VE Standards	Yes.	
63.6(h)(7)	Opacity/VE Standards	Yes.	
63.6(i)(1)–(14)	Extension of Compliance	Yes.	
63.6(i)(15)		No	[Reserved].
63.6(i)(16)	Extension of Compliance	Yes.	
63.6(j)	Exemption from Compliance	Yes.	
63.7(a)(1)–(3)	Performance Testing Requirements	Yes	§ 63.1349 has specific requirements.
63.7(b)	Notification	Yes.	
63.7(c)	Quality Assurance/Test Plan	Yes.	
63.7(d)	Testing Facilities	Yes.	
63.7(e)(1)–(4)	Conduct of Tests	Yes.	
63.7(f)	Alternative Test Method	Yes.	
63.7(g)	Data Analysis	Yes.	
63.7(h)	Waiver of Tests	Yes.	
63.8(a)(1)	Monitoring Requirements	Yes.	
63.8(a)(2)	Monitoring	No	§ 63.1350 includes CEMS requirements.
63.8(a)(3)		No	[Reserved].
63.8(a)(4)	Monitoring	No	Flares not applicable.
63.8(b)(1)–(3)	Conduct of Monitoring	Yes.	
63.8(c)(1)–(8)	CMS Operation/Maintenance	Yes	Temperature and activated carbon injection monitoring data reduction requirements given in subpart LLL.
63.8(d)	Quality Control	Yes.	
63.8(e)	Performance Evaluation for CMS	Yes.	
63.8(f)(1)–(5)	Alternative Monitoring Method	Yes	Additional requirements in § 63.1350(l).
63.8(f)(6)	Alternative to RATA Test	Yes.	
63.8(g)	Data Reduction	Yes.	
63.9(a)	Notification Requirements	Yes.	
63.9(b)(1)–(5)	Initial Notifications	Yes.	
63.9(c)	Request for Compliance Extension	Yes.	
63.9(d)	New Source Notification for Special Compliance Requirements.	Yes.	
63.9(e)	Notification of Performance Test	Yes.	
63.9(f)	Notification of VE/Opacity Test	Yes	Notification not required for VE/opacity test under § 63.1350(e) and (j).
63.9(g)	Additional CMS Notifications	Yes.	
63.9(h)(1)–(3)	Notification of Compliance Status	Yes.	
63.9(h)(4)		No	[Reserved].
63.9(h)(5)–(6)	Notification of Compliance Status	Yes.	
63.9(i)	Adjustment of Deadlines	Yes.	
63.9(j)	Change in Previous Information	Yes.	
63.10(a)	Recordkeeping/Reporting	Yes.	
63.10(b)	General Requirements	Yes.	
63.10(c)(1)	Additional CMS Recordkeeping	Yes	PS–8A supersedes requirements for THC CEMS.
63.10(c)(2)–(4)		No	[Reserved].
63.10(c)(5)–(8)	Additional CMS Recordkeeping	Yes	PS–8A supersedes requirements for THC CEMS.
63.10(c)(9)		No	[Reserved].
63.10(c)(10)–(15)	Additional CMS Recordkeeping	Yes	PS–8A supersedes requirements for THC CEMS.
63.10(d)(1)	General Reporting Requirements	Yes.	
63.10(d)(2)	Performance Test Results	Yes.	
63.10(d)(3)	Opacity or VE Observations	Yes.	
63.10(d)(4)	Progress Reports	Yes.	
63.10(d)(5)	Startup, Shutdown, Malfunction Reports.	Yes.	
63.10(e)(1)–(2)	Additional CMS Reports	Yes.	

TABLE 1 TO SUBPART LLL OF PART 63—APPLICABILITY OF GENERAL PROVISIONS—Continued

Citation	Requirement	Applies to subpart LLL	Explanation
63.10(e)(3)	Excess Emissions and CMS Perform-ance Reports.	Yes	Exceedances are defined in subpart LLL.
63.10(f)	Waiver for Recordkeeping/Reporting ...	Yes.	
63.11(a)–(b)	Control Device Requirements	No	Flares not applicable.
63.12(a)–(c)	State Authority and Delegations	Yes.	
63.13(a)–(c)	State/Regional Addresses	Yes.	
63.14(a)–(b)	Incorporation by Reference	Yes.	
63.15(a)–(b)	Availability of Information	Yes.	

Appendix to Part 63—[Amended]

17. Section 1.3.2 of Method 321 of Appendix A to Part 63—Test Methods is revised to read as follows:

Appendix A to Part 63—Test Methods

*   *   *   *   *

Test Method 321—Measurement of Gaseous Hydrogen Chloride Emissions at Portland Cement Kilns by Fourier Transform Infrared (FTIR) Spectroscopy

*   *   *   *   *

1.3.2   The practical lower quantification range is usually higher than that indicated by the instrument performance in the laboratory, and is dependent upon (1) the presence of interfering species in the exhaust gas (notably H_2O), (2) the optical alignment of the gas cell and transfer optics, and (3) the quality of the reflective surfaces in the cell (cell throughput). Under typical test conditions (moisture content of up to 30 percent, 10 meter absorption pathlength, liquid nitrogen-cooled IR detector, 0.5 cm^{-1} resolution, and an interferometer sampling time of 60 seconds) a typical lower quantification range for HCl is 0.1 to 1.0 ppm.

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[FR Doc. E9–10206 Filed 5–5–09; 8:45 am]

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