



ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 63

[EPA-HQ-OAR-2010-1041, EPA-HQ-OAR-2010-1042; FRL-9491-9]

RIN 2060-AQ90

**National Emissions Standards for Hazardous Air Pollutants:
Mineral Wool Production and Wool Fiberglass Manufacturing**

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The EPA is proposing amendments to the national emissions standards for hazardous air pollutants for Mineral Wool Production and Wool Fiberglass Manufacturing to address the results of the residual risk and technology review that the EPA is required to conduct by the Clean Air Act. The proposed Mineral Wool Production amendments include emissions limits for carbonyl sulfide, hydrogen fluoride and hydrochloric acid for cupolas; add combined collection and curing processes as new regulated sources; and include emissions limits for formaldehyde, phenol and methanol for combined collection and curing operations. Modifications to the testing and monitoring and related notification, recordkeeping and reporting requirements are also proposed.

The proposed amendments for the Wool Fiberglass Manufacturing source category include emissions limits for

chromium compounds, hydrogen fluoride, hydrochloric acid and particulate matter for glass-melting furnaces at major sources; revised emissions limits for formaldehyde, and the addition of emissions limits for phenol and methanol for bonded product lines at major sources; and modifications to testing and monitoring and related notification, recordkeeping and reporting requirements.

These proposed rules only apply to major sources, but we plan to regulate wool fiberglass area sources in a future action.

We are also proposing to revise provisions addressing periods of startup, shutdown and malfunction to ensure that the rules are consistent with a recent court decision.

DATES: Comments must be received on or before [INSERT THE DATE 60 DAYS AFTER THE DATE OF PUBLICATION IN THE FEDERAL REGISTER].

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 receives a copy of your comments on or before [INSERT THE DATE 30 DAYS AFTER THE DATE OF PUBLICATION IN THE FEDERAL REGISTER].

Public Hearing. If anyone contacts the EPA requesting to speak at a public hearing by December 5, 2011, a public hearing will be held on [INSERT THE DATE 15 DAYS AFTER THE DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: Submit your comments, identified by Docket ID Numbers EPA-HQ-OAR-2010-1041 and EPA-HQ-OAR-2010-1042, by one of the following methods:

- <http://www.regulations.gov>: Follow the on-line instructions for submitting comments.
- Email: a-and-r-docket@epa.gov, Attention Docket ID Number EPA-HQ-OAR-2010-1041 and EPA-HQ-OAR-2010-1042.
- Fax: (202) 566-9744, Attention Docket ID Number EPA-HQ-OAR-2010-1041 or EPA-HQ-OAR-2010-1042.
- Mail: U.S. Postal Service, send comments to: EPA Docket Center, EPA West (Air Docket), Attention Docket ID Number EPA-HQ-OAR-2010-1041 or EPA-HQ-OAR-2010-1042, U.S. Environmental Protection Agency, Mailcode: 2822T, 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, Attn: Desk Officer for EPA, 725 17th Street, NW, Washington, DC 20503.
- Hand Delivery: U.S. Environmental Protection Agency, EPA West (Air Docket), Room 3334, 1301 Constitution Ave., NW, Washington, DC 20004, Attention Docket ID Number EPA-HQ-OAR-2010-1041 or EPA-HQ-OAR-2010-1042. Such deliveries are

only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions. Direct your comments on the Mineral Wool RTR to Docket ID Number EPA-HQ-OAR-2010-1041 and direct your comments on the Wool Fiberglass RTR to Docket ID Number EPA-HQ-OAR-2010-1042. The EPA's policy is that all comments received will be included in the public docket without change and may be made available on-line at <http://www.regulations.gov>, including any personal information provided, unless the comment includes information claimed to be 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 email. The <http://www.regulations.gov> website is an "anonymous access" system, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through <http://www.regulations.gov>, your email 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, the 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 the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the 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. For additional information about the EPA's public docket, visit the EPA Docket Center homepage at <http://www.epa.gov/epahome/dockets.htm>.

Docket. The EPA has established dockets for this rulemaking under Docket ID Number EPA-HQ-OAR-2010-1041 (Mineral Wool Production) and EPA-HQ-OAR-2010-1042 (Wool Fiberglass Manufacturing). 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, is not placed on the Internet and 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, 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 EPA Docket Center is (202) 566-1742.

FOR FURTHER INFORMATION CONTACT: For questions about this proposed action, contact Ms. Susan Fairchild, Sector Policies and Programs Division (D243-04), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone (919) 541-5167; fax number: (919) 541-3207; and email address: fairchild.susan@epa.gov. For specific information regarding the risk modeling methodology, contact Mr. Chris Sarsony, Health and Environmental Impacts Division (C539-02), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541-4843; fax number: (919) 541-0840; and email address: sarsony.chris@epa.gov. For information about the applicability of the NESHAP to a particular entity, contact Scott Throwe, Office of Enforcement and Compliance Assurance; US EPA Headquarters Ariel Rios Building; 1200 Pennsylvania Avenue, N.W.; Mail Code: 2227A; Washington, DC 20460; telephone number: (202) 564-7013; fax number: (202) 564-0050; email address: throwe.scott@epa.gov.

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A. What data were used for the NESHAP analyses?

B. What are the proposed decisions regarding surrogacy relationships?

C. What are the proposed decisions regarding certain unregulated emissions sources?

D. What are the results from the risk assessments and analyses and the proposed decisions for the Wool Fiberglass Manufacturing Source Category?

E. What are our proposed decisions for the Wool Fiberglass Manufacturing source category based on risk acceptability and ample margin of safety?

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H. What are the economic impacts for the Mineral Wool Production source category?

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J. What demographic groups might benefit the most from this regulation?

X. Summary of Cost, Environmental, and Economic Impacts for the Wool Fiberglass Manufacturing Source Category

A. What are the affected sources in the Wool Fiberglass Manufacturing source category?

- B. How are the impacts for this proposal evaluated?
- C. What are the air quality impacts?
- D. What are the water quality and solid waste impacts?
- E. What are the secondary impacts?
- F. What are the energy impacts?
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I. Preamble Acronyms and Abbreviations

Several acronyms and terms used to describe industrial processes, data inventories, and risk modeling are included in this preamble. While this may not be an exhaustive list, to ease the reading of this preamble and for reference purposes, the following terms and acronyms are defined here:

ACGIH	American Conference of Governmental Industrial Hygienists
AEGL	acute exposure guideline levels
AERMOD	air dispersion model used by the HEM-3 model
ATSDR	Agency for Toxic Substances and Disease Registry
BACT	best available control technology
BLDS	bag leak detection systems
BTF	beyond the floor
CAA	Clean Air Act
CalEPA	California EPA
CA-REL	California reference exposure level
CBI	Confidential Business Information
CFR	Code of Federal Regulations
CIIT	Chemical Industry Institute of Toxicology
CO	carbon monoxide
COS	Carbonyl sulfide
EJ	environmental justice
EPA	Environmental Protection Agency
ERPG	Emergency Response Planning Guidelines
ERT	Electronic Reporting Tool
ESP	electrostatic precipitators
FA	flame attenuation
GP	General Provisions
GHG	Greenhouse Gases
HAP	hazardous air pollutants
HCl	Hydrogen chloride
HEM	Human Exposure Model
HEM-3	Human Exposure Model, Version 3
HF	Hydrogen fluoride
HI	Hazard Index
HQ	Hazard Quotient
IRFA	Initial Regulatory Flexibility Analysis
IRIS	Integrated Risk Information System
kg/MG	kilogram/megawatt
km	kilometer
LAER	lowest achievable emissions rate
lb/ton	pounds per ton
lb/yr	pounds per year
MACT	maximum achievable control technology

mg/L	milligrams per liter
mg/m ³	milligrams per cubic meter
MIR	maximum individual risk
NAAQS	National Ambient Air Quality Standard
NAICS	North American Industry Classification System
NaOH	sodium hydroxide
NAS	National Academy of Sciences
NATA	National Air Toxics Assessment
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NIOSH	National Institutes for Occupational Safety and Health
NRC	National Research Council
NTTAA	National Technology Transfer and Advancement Act
OAQPS	Office of Air Quality Planning and Standards
OMB	Office of Management and Budget
PB-HAP	hazardous air pollutants known to be persistent and bio-accumulative in the environment
PM	particulate matter
RACT	reasonably available control technology
RBLC	RACT/BACT/LAER Clearinghouse
RCRA	Resource Conservation and Recovery Conservation
REL	reference exposure level
RFA	Regulatory Flexibility Act
RfC	reference concentrations
RfD	reference dose
RS	rotary spin
RTO	regenerative thermal oxidizers
RTR	residual risk and technology review
SAB	Science Advisory Board
SBA	Small Business Administration
SBAR	Small Business Advocacy Review
SCC	Source Classification Codes
SER	Small Entity Representatives
SO ₂	sulfur dioxide
SSM	startup, shutdown, and malfunction
TC	Toxicity Characteristics
TCLP	Toxicity Characteristic Leaching Procedure
TLV	threshold limit value

TOSHI	target organ-specific hazard index
tpy	tons per year
TRIM	Total Risk Integrated Modeling System
TTN	Technology Transfer Network
UF	uncertainty factors
$\mu\text{g}/\text{m}^3$	microgram per cubic meter
UMRA	Unfunded Mandates Reform Act
UPL	upper predictive limit
URE	unit risk estimate
WHO	World Health Organization
WWW	worldwide web

II. General Information

A. Does this action apply to me?

The regulated industrial source categories that are the subject of this proposed rule are listed in Table 1 of this preamble. Table 1 of this preamble is not intended to be exhaustive, but rather provides a guide for readers regarding the entities likely to be affected by this proposed action. These standards, once finalized, will be directly applicable to affected sources. Federal, state, local, and tribal government entities are not affected by this proposed action.

In 1992 the EPA defined the Mineral Wool Production source category as any facility engaged in producing mineral wool fiber from slag or rock. Mineral wool is a material used mainly for thermal and acoustical insulation. This category includes, but is not limited to, the following process units: a cupola furnace for melting the mineral charge; a blow chamber in which air and,

in some cases, a binder is drawn over the fibers, forming them to a screen; a curing oven to bond the fibers; and a cooling compartment.

In 1992 the EPA defined the Wool Fiberglass Manufacturing source category as any facility engaged in producing wool fiberglass from sand, feldspar, sodium sulfate, anhydrous borax, boric acid or any other materials. In the wool fiberglass manufacturing process, molten glass is formed into fibers that are bonded with an organic resin to create a wool-like material that is used as thermal or acoustical insulation. The category includes, but is not limited to the following processes: glass-melting furnace, marble forming, refining, fiber forming, binder application, curing and cooling.

Table 1. NESHAP and Industrial Source Categories Affected By This Proposed Action

Source Category	NESHAP	NAICS code ¹
Mineral Wool Production	Mineral Wool Production	327993
Wool Fiberglass Manufacturing	Wool Fiberglass Manufacturing	327993

¹ North American Industry Classification System

B. Where can I get a copy of this document and other related information?

In addition to being available in the docket, an electronic copy of this proposal will also be available on the WWW through the EPA's TTN. Following signature by the EPA Administrator, a

copy of this proposed action will be posted on the TTN's policy and guidance page for newly proposed or promulgated rules at the following address: <http://www.epa.gov/ttn/atw/rrisk/rtrpg.html>.

In addition, a copy of each rule showing specific changes proposed under this action is available in their respective dockets. The TTN provides information and technology exchange in various areas of air pollution control.

C. What should I consider as I prepare my comments for the EPA?

Submitting CBI. Do not submit information containing CBI to the EPA through <http://www.regulations.gov> or email. Clearly mark the part or all of the information that you claim to be CBI. For CBI information on a disk or CD ROM that you mail to the 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. If you submit a CD ROM or disk that does not contain CBI, mark the outside of the disk or CD ROM clearly indicating that it does not contain CBI. Information not marked as CBI will be included in the public docket and the EPA's electronic public docket without prior notice. Information marked as CBI will not be disclosed except in accordance with procedures set forth in

40 CFR part 2. 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, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, Attention Docket ID Number EPA-HQ-OAR-2010-1041 (Mineral Wool RTR) or Attention Docket ID Number EPA-HQ-OAR-2010-1042 (Wool Fiberglass RTR).

D. When will a public hearing occur?

If a public hearing is held, it will begin at 10:00 a.m. on [INSERT DATE 15 DAYS AFTER THE DATE OF PUBLICATION IN THE FEDERAL REGISTER] and will be held at a location to be determined. Persons interested in presenting oral testimony or inquiring as to whether a public hearing is to be held should contact Ms. Pamela Garrett, Office of Air Quality Planning and Standards, Sector Policies and Programs Division, (D243-01), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541-7996; email address: garrett.pamela@epa.gov.

III. Background Information

A. What are NESHAP?

1. What is the statutory authority for NESHAP?

Section 112 of the CAA establishes a two-stage regulatory process to address emissions of HAP from stationary sources. In the first stage, after the EPA has identified categories of

sources emitting one or more of the HAP listed in CAA section 112(b), CAA section 112(d) calls for us to promulgate NESHAP for those sources. "Major sources" are those that emit or have the potential to emit 10 tpy or more of a single HAP or 25 tpy or more of any combination of HAP. For major sources, these technology-based standards must reflect the maximum degree of emissions reductions of HAP achievable (after considering cost, energy requirements, and non-air quality health and environmental impacts) and are commonly referred to as MACT standards. Area sources are those that emit less than major amounts of HAP.

MACT standards must require the maximum degree of emissions reduction through the application of measures, processes, methods, systems, or techniques, including, but not limited to, measures that (A) reduce the volume of or eliminate pollutants through process changes, substitution of materials or other modifications; (B) enclose systems or processes to eliminate emissions; (C) capture or treat pollutants when released from a process, stack, storage or fugitive emissions point; (D) are design, equipment, work practice or operational standards (including requirements for operator training or certification); or (E) are a combination of the above (CAA section 112(d)(2)(A)-(E)). The MACT standards may take the form of design, equipment, work practice or operational standards where the EPA first

determines either that, (A) a pollutant cannot be emitted through a conveyance designed and constructed to emit or capture the pollutants, or that any requirement for, or use of, such a conveyance would be inconsistent with law; or (B) the application of measurement methodology to a particular class of sources is not practicable due to technological and economic limitations (CAA sections 112(h)(1)-(2)).

The MACT "floor" is the minimum control level allowed for MACT standards promulgated under CAA section 112(d)(3) and may not be based on cost considerations. For new sources, the MACT floor cannot be less stringent than the emissions control that is achieved in practice by the best-controlled similar source. The MACT floors for existing sources can be less stringent than floors for new sources, but they cannot be less stringent than the average emissions limitation achieved by the best-performing 12 percent of existing sources in the category or subcategory (or the best-performing 5 sources for categories or subcategories with fewer than 30 sources). In developing MACT standards, we must also consider control options that are more stringent than the floor. We may establish standards more stringent than the floor based on considerations of the cost of achieving the emissions reductions, any non-air quality health and environmental impacts, and energy requirements.

The EPA is then required to review these technology-based standards and revise them "as necessary (taking into account developments in practices, processes, and control technologies)" no less frequently than every 8 years, under CAA section 112(d)(6). In conducting this review, the EPA is not obliged to completely recalculate the prior MACT determination, and, in particular, is not obligated to recalculate the MACT floors. NRDC v. EPA, 529 F.3d 1077, 1084 (D. C. Cir., 2008).

The second stage in standard-setting focuses on reducing any remaining "residual" risk according to CAA section 112(f). This provision requires, first, that the EPA prepare a Report to Congress discussing (among other things) methods of calculating the risks posed (or potentially posed) by sources after implementation of the MACT standards, the public health significance of those risks, and the EPA's recommendations as to legislation regarding such remaining risk. The EPA prepared and submitted this report (Residual Risk Report to Congress, EPA-453/R-99-001) in March 1999. Congress did not act in response to the report, thereby triggering the EPA's obligation under CAA section 112(f)(2) to analyze and address residual risk.

Section 112(f)(2) of the CAA requires us to determine, for source categories subject to certain MACT standards, whether those emissions standards provide an ample margin of safety to protect public health. If the MACT standards that apply to a

source category emitting a HAP that is "classified as a known, probable, or possible human carcinogen do not reduce lifetime excess cancer risks to the individual most exposed to emissions from a source in the category or subcategory to less than one-in-one million," the EPA must promulgate residual risk standards for the source category (or subcategory) as necessary to provide an ample margin of safety to protect public health (CAA section 112(f)(2)(A)). This requirement is procedural. It mandates that the EPA establish CAA section 112(f) residual risk standards if certain risk thresholds are not satisfied, but does not determine the level of those standards (NRDC v. EPA, 529 F. 3d at 1083). The second sentence of CAA section 112(f)(2) sets out the substantive requirements for residual risk standards: protection of public health with an ample margin of safety based on the EPA's interpretation of this standard in effect at the time of the CAA amendments. Id. This refers to the National Emissions Standards for Hazardous Air Pollutants: Benzene Emissions from Maleic Anhydride Plants, Ethylbenzene/Styrene Plants, Benzene Storage Vessels, Benzene Equipment Leaks, and Coke By-Product Recovery Plants (Benzene NESHAP), (54 FR 38044, September 14, 1989), described in the next paragraph.

The EPA may adopt residual risk standards equal to existing MACT standards if the EPA determines that the existing standards are sufficiently protective, even if (for example) excess cancer

risks to a most exposed individual are not reduced to less than one-in-one million. Id. at 1083, ("If the EPA determines that the existing technology-based standards provide an 'ample margin of safety,' then the agency is free to readopt those standards during the residual risk rulemaking"). Section 112(f)(2) of the CAA further authorizes the EPA to adopt more stringent standards, if necessary "to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect."¹

CAA section 112(f)(2) expressly preserves our use of the two-step process for developing standards to address any residual risk and our interpretation of "ample margin of safety" developed in the Benzene NESHAP. The first step in this process is the determination of acceptable risk. This determination "considers all health information, including risk estimation uncertainty, and includes a presumptive limit on MIR [cancer]² of approximately 1-in-10 thousand [i.e., 100-in-1 million]" (54 FR 38045). In the second step of the process, the EPA sets the

¹ "Adverse environmental effect" is defined in CAA section 112(a)(7) as any significant and widespread adverse effect, which may be reasonably anticipated to wildlife, aquatic life, or natural resources, including adverse impacts on populations of endangered or threatened species or significant degradation of environmental qualities over broad areas.

² Although defined as "maximum individual risk," MIR refers only to cancer risk. MIR, one metric for assessing cancer risk, is the estimated risk were an individual exposed to the maximum level of a pollutant for a lifetime.

standard at a level that provides an ample margin of safety "in consideration of all health information, including the number of persons at risk levels higher than approximately 1-in-1 million, as well as other relevant factors, including costs and economic impacts, technological feasibility, and other factors relevant to each particular decision" (Id.)

The terms "individual most exposed", "acceptable level", and "ample margin of safety" are not specifically defined in the CAA. However, CAA section 112(f)(2)(B) preserves the EPA's interpretation set out in the Benzene NESHAP, and the Court in NRDC v. EPA concluded that the EPA's interpretation of CAA section 112(f)(2) is a reasonable one. See NRDC v. EPA, 529 F.3d at 1083 (D.C. Cir. 2008), which says "[S]ubsection 112(f)(2)(B) expressly incorporates the EPA's interpretation of the CAA from the Benzene standard, complete with a citation to the Federal Register." See also, A Legislative History of the Clean Air Act Amendments of 1990, volume 1, p. 877 (Senate debate on Conference Report). We also notified Congress in the Residual Risk Report to Congress that we intended to use the Benzene NESHAP approach in making CAA section 112(f) residual risk determinations (EPA-453/R-99-001, p. ES-11).

In the Benzene NESHAP, we stated as an overall objective: *

* * in protecting public health with an ample margin of safety, we strive to provide maximum feasible protection against risks

to health from hazardous air pollutants by (1) protecting the greatest number of persons possible to an individual lifetime risk level no higher than approximately 1-in-1 million; and (2) limiting to no higher than approximately 1-in-10 thousand [i.e., 100-in-1 million] the estimated risk that a person living near a facility would have if he or she were exposed to the maximum pollutant concentrations for 70 years.

The agency also stated that, "The EPA also considers incidence (the number of persons estimated to suffer cancer or other serious health effects as a result of exposure to a pollutant) to be an important measure of the health risk to the exposed population. Incidence measures the extent of health risks to the exposed population as a whole, by providing an estimate of the occurrence of cancer or other serious health effects in the exposed population." The agency went on to conclude that "estimated incidence would be weighed along with other health risk information in judging acceptability." As explained more fully in our Residual Risk Report to Congress, the EPA does not define "rigid line[s] of acceptability," but rather considers broad objectives to be weighed with a series of other health measures and factors (EPA-453/R-99-001, p. ES-11). The determination of what represents an "acceptable" risk is based on a judgment of "what risks are acceptable in the world in which we live" (Residual Risk Report to Congress, p. 178,

quoting the D.C. Circuit's en banc Vinyl Chloride decision at 824 F.2d 1165) recognizing that our world is not risk-free.

In the Benzene NESHAP, we stated that "the EPA will generally presume that if the risk to [the maximum exposed] individual is no higher than approximately 1-in-10 thousand, that risk level is considered acceptable." 54 FR 38045. We discussed the maximum individual lifetime cancer risk as being "the estimated risk that a person living near a plant would have if he or she were exposed to the maximum pollutant concentrations for 70 years." Id. We explained that this measure of risk "is an estimate of the upper bound of risk based on conservative assumptions, such as continuous exposure for 24 hours per day for 70 years." Id. We acknowledge that maximum individual lifetime cancer risk "does not necessarily reflect the true risk, but displays a conservative risk level which is an upper-bound that is unlikely to be exceeded." Id.

Understanding that there are both benefits and limitations to using maximum individual lifetime cancer risk as a metric for determining acceptability, we acknowledged in the 1989 Benzene NESHAP that "consideration of maximum individual risk * * * must take into account the strengths and weaknesses of this measure of risk." Id. Consequently, the presumptive risk level of 100-in-1 million (1-in-10 thousand) provides a benchmark for judging the acceptability of maximum individual lifetime cancer risk,

but does not constitute a rigid line for making that determination.

The agency also explained in the 1989 Benzene NESHAP the following: "In establishing a presumption for MIR [maximum individual cancer risk], rather than a rigid line for acceptability, the agency intends to weigh it with a series of other health measures and factors. These include the overall incidence of cancer or other serious health effects within the exposed population, the numbers of persons exposed within each individual lifetime risk range and associated incidence within, typically, a 50- km exposure radius around facilities, the science policy assumptions and estimation uncertainties associated with the risk measures, weight of the scientific evidence for human health effects, other quantified or unquantified health effects, effects due to co-location of facilities, and co-emissions of pollutants." Id.

In some cases, these health measures and factors taken together may provide a more realistic description of the magnitude of risk in the exposed population than that provided by maximum individual lifetime cancer risk alone. As explained in the Benzene NESHAP, "[e]ven though the risks judged 'acceptable' by the EPA in the first step of the Vinyl Chloride inquiry are already low, the second step of the inquiry, determining an 'ample margin of safety,' again includes

consideration of all of the health factors, and whether to reduce the risks even further." In the ample margin of safety decision process, the agency again considers all of the health risks and other health information considered in the first step. Beyond that information, additional factors relating to the appropriate level of control will also be considered, including costs and economic impacts of controls, technological feasibility, uncertainties and any other relevant factors. Considering all of these factors, the agency will establish the standard at a level that provides an ample margin of safety to protect the public health and prevent adverse environmental effects, taking into consideration costs, energy, safety, and other relevant factors, as required by CAA section 112(f) (54 FR 38046).

2. How do we consider the risk results in making decisions?

In past residual risk determinations, the EPA presented a number of human health risk metrics associated with emissions from the category under review, including: the MIR; the numbers of persons in various risk ranges; cancer incidence; the maximum noncancer HI; and the maximum acute noncancer hazard. In estimating risks, the EPA considered source categories under review that are located near each other and that affect the same population. The EPA provided estimates of the expected difference in actual emissions from the source category under

review and emissions allowed pursuant to the source category MACT standard. The EPA also discussed and considered risk estimation uncertainties. The EPA is providing this same type of information in support of these actions.

The agency acknowledges that the Benzene NESHAP provides flexibility regarding what factors the EPA might consider in making our determinations and how they might be weighed for each source category. In responding to comment on our policy under the Benzene NESHAP, the EPA explained that: "The policy chosen by the Administrator permits consideration of multiple measures of health risk. Not only can the MIR figure be considered, but also incidence, the presence of noncancer health effects, and the uncertainties of the risk estimates. In this way, the effect on the most exposed individuals can be reviewed as well as the impact on the general public. These factors can then be weighed in each individual case. This approach complies with the Vinyl Chloride mandate that the Administrator ascertain an acceptable level of risk to the public by employing [her] expertise to assess available data. It also complies with the Congressional intent behind the CAA, which did not exclude the use of any particular measure of public health risk from the EPA's consideration with respect to CAA section 112 regulations, and, thereby, implicitly permits consideration of all measures of health risk which the Administrator, in [her] judgment, believes

are appropriate to determining what will 'protect the public health.'"

For example, the level of the MIR is only one factor to be weighed in determining acceptability of risks. The Benzene NESHP explains "an MIR of approximately 1-in-10 thousand should ordinarily be the upper end of the range of acceptability. As risks increase above this benchmark, they become presumptively less acceptable under CAA section 112, and would be weighed with the other health risk measures and information in making an overall judgment on acceptability. Or, the agency may find, in a particular case, that a risk that includes an MIR less than the presumptively acceptable level is unacceptable in the light of other health risk factors." Similarly, with regard to the ample margin of safety analysis, the Benzene NESHP states that: "the EPA believes the relative weight of the many factors that can be considered in selecting an ample margin of safety can only be determined for each specific source category. This occurs mainly because technological and economic factors (along with the health-related factors) vary from source category to source category."

B. What litigation is related to this proposed action?

In 2007, the D.C. Circuit (Court) found that the EPA had erred in establishing emissions standards for sources of HAP in the NESHP for Brick and Structural Clay Products Manufacturing

and Clay Ceramics Manufacturing, 67 FR 26,690 (May 16, 2003), and consequently vacated the rule.³ These errors included incorrectly calculated MACT emission limits, instances where EPA failed to set emission limits, and instances where EPA failed to regulate processes that emitted HAP. We are taking action to correct errors in both the Mineral Wool and Wool Fiberglass NESHAP for HAP that are not regulated. Some pollutants were represented in the 1999 MACT rules by surrogates; other pollutants were not regulated at all in the rule. In both these cases, we are establishing pollutant-specific emission limits. With the exception of PM as a surrogate for all HAP metals, where surrogacy relationships exist, we are proposing to remove that surrogacy. We are also correcting one unregulated HAP-emitting process in the Mineral Wool NESHAP.

In two earlier court decisions^{4,5} the court found EPA had erred in not setting MACT standards for every HAP emitted from a source. Therefore, with the exception of PM as a surrogate for HAP metals, in this action we are proposing emission limits for all HAP emitted from Mineral Wool and Wool Fiberglass. We note that we have established through previous analyses upheld by the

³ *Sierra Club v. EPA*, 479 F. 3d 875 (D.C. Cir. March 13, 2007).

⁴ *Cement Kiln Recycling Coalition v. EPA*, 255 F.3d 855 (D.C. Cir. 2001) (per curiam).

⁵ *National Lime Ass'n v. EPA*, 233 F.3d 625 (D.C. Cir. 2000).

court⁶ that PM is an appropriate surrogate for HAP metals, therefore, we retain that surrogacy relationship in these proposed rules.

In separate litigation, the Court vacated portions of two provisions in EPA's CAA section 112 regulations that govern emissions of HAP during periods of SSM.⁷ Specifically, the Court vacated the SSM exemption contained in 40 CFR §§ 63.6(f)(1) and 63.6(h)(1) that are part of regulations commonly referred to as the GP rule. When incorporated into section 112(d) regulations for specific source categories, these two provisions exempt sources from the requirement to comply with otherwise applicable MACT standards during periods of SSM. Because both of the Mineral Wool and Wool Fiberglass NESHAP relied on the GP rule for startup and shutdown provisions (40 CFR §§ 63.1194 and 63.1386(c)), we are also proposing to revise these provisions for both of the Mineral Wool and Wool Fiberglass source categories.

Recent litigation⁸ led to a consent decree under which we must propose these amendments no later than October 31, 2011; and promulgate no later than June 29, 2012.

IV. Mineral Wool and Wool Fiberglass Source Categories

⁶ *Sierra Club v. EPA*, 353 F. 3d 976 (D.C. Cir. 2004).

⁷ *Sierra Club v. EPA*, 551 F. 3d 1019 (D.C. Cir. 2008), cert. denied, 130 S. Ct 1735 (2010).

⁸ Consent Decree, *Sierra Club v. Jackson* (No. 09-cv-00152SBA, N.D. Cal., Sept. 27, 2010).

A. Overview of the Mineral Wool Production Source Category and MACT Standards.

The NESHAP (or MACT rule) for the Mineral Wool Production source category was promulgated on June 1, 1999 (64 FR 29490), and codified at 40 CFR part 63, subpart DDD. As promulgated in 1999, the NESHAP applies to affected sources of HAP emissions at mineral wool production facilities. As defined in the 1992 EPA report, "Documentation for Developing the Initial Source Category List" (EPA-450/3/91/030, July 1992), a "mineral wool facility" is "any facility engaged in producing mineral wool fiber from slag, rock or other materials, excluding sand or glass."

The MACT rule for the Mineral Wool Production source category does not apply to facilities that manufacture wool fiberglass from sand, feldspar, sodium sulfate, anhydrous borax, boric acid or other similar materials.⁹ Although there are some similarities among rock that may be used for both mineral wool and wool fiberglass production, the two industries are distinct. Mineral wool is used in cases in which fireproofing, structural strength and sound attenuation are needed, such as in high occupancy commercial and industrial buildings. Wool fiberglass

⁹ Wool fiberglass produced from sand, feldspar, sodium sulfate, anhydrous borax, boric acid, etc. are a part of the wool fiberglass source category, which is also addressed in this action.

is used primarily for insulation, in residential and small commercial buildings. Some wool fiberglass facilities also operate a ceiling tile or pipe product manufacturing line. The manufacturing of ceiling tile is not regulated under the Wool Fiberglass Manufacturing MACT Standard.

Today, there are seven mineral wool facilities that are subject to the MACT rule. No new mineral wool facilities have been built in the last 21 years and the agency does not anticipate new mineral wool facilities will be built in the foreseeable future. According to the size definition applied to this industry by the U.S. SBA (750 company employees or less), 5 of the 7 firms, employing 540 employees altogether, are classified as a small business.

Mineral wool is a fibrous, glassy substance consisting of silicate fibers typically 4 to 7 micrometers in diameter, made from natural rock (such as basalt, granite and other rock), blast furnace slag, glass cullet, coke and other similar materials. Products made from mineral wool are widely used in thermal and acoustical insulation and other products where mineral wool fiber is added to impart structural strength or fire resistance. In the mineral wool manufacturing process, raw materials (e.g., rock and slag) are melted in a cupola using coke as fuel; the molten material is then formed into fiber. In the production of mineral wool products that do not require high

rigidity, oil is typically applied to suppress dust and add some strength to the fiber; the fiber is then sized and bagged or baled. This is known as a "nonbonded" product which is manufactured on a "nonbonded" production line.

For mineral wool products requiring a higher structural rigidity, typically a phenol/formaldehyde binder may be applied to the fiber. The binder-laden fiber mat is then thermoset in a curing oven and cooled. This is known as a "bonded" product which is made on a "bonded product" line. The major differences between the "nonbonded" and "bonded" production lines are the application of binder during fiber collection and the use of a curing oven. Four facilities only manufacture nonbonded products, while the other three facilities operate both bonded and nonbonded production lines. A total of 11 cupolas and 3 curing ovens are operated by the facilities in this source category.

HAP emission sources at mineral wool production facilities include the cupola where the mineral charge is melted; a collection chamber, in which air and a binder are drawn over the fibers, forming them into a mat against a screen; and a curing oven that bonds the fibers (for bonded products). HAP are emitted from the cupolas, curing ovens and collection operations when collection occurs with curing. Collection at nonbonded product lines does not emit HAP. COS accounts for the majority

of the HAP emissions from these facilities (approximately 224 tpy and 51 percent of the total HAP emissions by mass). The majority of HAP emissions (approximately 58 percent of the total HAP by mass, including HF and HCl are from the cupolas. The remainder of the HAP are from bonded lines, including phenol, formaldehyde, and methanol. Although the majority of HAP are emitted from the cupola, the emissions (primarily formaldehyde and phenol) that were significant in evaluating risk are from the collection chambers on the bonded lines. Formaldehyde and phenol are emitted only from bonded mineral wool production lines; these lines include emissions from the application of the binder during collection and curing.

The current NESHAP requires control of PM emissions, as a surrogate for HAP metals, from the cupolas and formaldehyde emissions from the curing ovens. Fabric filters are the control devices used by this industry to reduce both PM and HAP metal emissions from cupolas. Emissions from collection operations are not regulated under the current NESHAP, but collection and curing ovens are generally controlled using RTOs and fabric filters.

The existing MACT rule applies to each existing, new and reconstructed cupola or curing oven in a mineral wool production facility. All mineral wool production facilities that are major sources are subject to the standards. For all cupolas, the 1999

MACT rule specifies a numerical emission limit for PM, as a surrogate for metal HAP. For new and reconstructed cupolas, emissions limits are specified for CO, as a surrogate for COS. Emissions limits for formaldehyde are also specified (as a surrogate for phenol emissions) for each existing, new, and reconstructed curing oven. Under the 1999 MACT rule, a mineral wool production facility may elect to comply with a numerical formaldehyde or CO emission limit expressed in mass of emissions per unit of production (kg/Mg of melt or lb/ton of melt) or a percent reduction standard. PM emissions from existing, new, and reconstructed cupolas are limited to an outlet concentration of 0.05 kg/Mg (0.10 lb/ton) of melt, 40 CFR 63.1178(a). CO emissions limits from new and reconstructed cupolas are limited to an outlet concentration of 0.05 kg/Mg (0.10 lb/ton) of melt or 99 percent CO removal, 40 CFR 63.1178(a). Formaldehyde emissions limits from existing, new, and reconstructed curing ovens are limited to an outlet concentration of 0.03 kg/Mg (0.06 lb/ton) of melt or 80 percent formaldehyde removal, 40 CFR 63.1179(a).

B. Overview of the Wool Fiberglass Manufacturing source category and 1999 MACT rule.

The NESHAP (or MACT rule) for the Wool Fiberglass Manufacturing source category was promulgated on June 14, 1999 (62 FR 31695), and codified at 40 CFR part 63, subpart NNN. As

promulgated in 1999, the MACT rule applies to affected sources of HAP emissions at wool fiberglass manufacturing facilities. Although the source category definition includes all manufacturers of wool fiberglass, the 1999 MACT rule (40 CFR 63.1381) defines a "wool fiberglass manufacturing facility" as "any facility manufacturing wool fiberglass on a RS manufacturing line producing bonded building insulation or on a FA manufacturing line producing bonded pipe insulation and bonded heavy-density products." The MACT rule for the Wool Fiberglass Manufacturing source category does not apply to facilities that manufacture mineral wool from rock, slag, and other similar materials. In addition, RS and FA manufacturing lines that produce nonbonded products (in which no phenol-formaldehyde binder is applied) are not subject to the current standards.

Wool fiberglass products are primarily used as thermal and acoustical insulation for buildings, automobiles, aircraft, appliances, ductwork and pipes. Other uses include liquid and air filtration. Approximately 90 percent of the wool fiberglass currently produced is used for residential and commercial building insulation products. Today, wool fiberglass is currently manufactured in the United States by 5 companies operating 29 facilities across 16 states. According to the size definition applied to this industry by the U.S. SBA (750 company

employees or less), none of these companies are classified as a small business. One new wool fiberglass facility was recently built in 2007 and one wool fiberglass facility closed in 2010. Because several furnaces have been idled across the industry, current production of wool fiberglass is below production levels from previous years, and several months of stockpiled products exist at wool fiberglass companies, we do not expect new wool fiberglass facilities to be built in the near future.

Wool fiberglass is manufactured in a process that forms thin fibers from molten glass. Over 90 percent of the wool fiberglass industry produces insulation; two plants also operate a pipe product line and one plant operates a ceiling tile line (although the production of ceiling tile is not part of this MACT standard). A typical wool fiberglass manufacturing line consists of the following processes: (1) heating of raw materials and/or cullet in a furnace to a molten state, (2) preparation of molten glass for fiberization, (3) formation of fibers into a wool fiberglass mat or pipe insulation product, (4) curing the binder-coated fiberglass mat, (5) cooling the mat (this process is not always present) and (6) backing, cutting, and packaging.

The primary component of most types of wool fiberglass is silica sand, but wool fiberglass also includes varying quantities of feldspar, sodium sulfate, anhydrous borax, boric

acid, and may be made entirely of glass cullet, crushed recycled glass. Wool fiberglass manufacturing plants typically operate one or more manufacturing lines. Refined raw materials for the glass batch are weighed, mixed, and conveyed to the glass-melting furnace, which may be gas-fired, electric, oxygen-enriched or a combination of gas and electric.

Two methods of forming fibers are used by the industry, RS and FA. In the RS process, centrifugal force causes molten glass to flow through small holes in the wall of a rapidly rotating cylinder. In the FA process, molten glass flows by gravity from a small furnace, or pot, to form threads that are then attenuated (stretched to the point of breaking) with air and/or flame.

After the fibers are formed, they are sprayed with a binder to hold the fibers together. These bonded fibers are then collected as a mat on a conveyor. Binder compositions vary with product type. At the time of development of the MACT standard, wool fiberglass mat was typically made using a phenol-formaldehyde resin based binder. According to the trade organization, only a few insulation products are currently made using a formaldehyde-based binder because new formaldehyde- and HAP-free binder formulations have been developed in recent

years.¹⁰ Most new binder formulations are now HAP-free. According to the information collected through a survey by the industry, a few pipe insulation products made from wool fiberglass are still made at two facilities using a phenol-formaldehyde based binder.

After application of the binder and formation of the mat, the conveyor carries the newly formed mat through an oven to cure the thermosetting resin and then through a cooling section. Some products, such as those made on FA manufacturing lines, do not require curing and/or cooling.

Process emissions sources include the furnace where the charge is melted; the collection process, in which air carrying a binder is drawn over the fibers, forming them into a mat; and the curing oven that bonds the fibers (for bonded products only).

HAP, including chromium compounds, are emitted from glass-melting furnaces. Glass-melting furnaces are constructed using refractory bricks or blocks (commonly called refractories), that provide thermal insulation and corrosion protection. The refractory bricks re-direct the heat of the furnace back into the melt. Refractories are produced to withstand the extreme corrosive thermal conditions of a furnace and may contain a

¹⁰ Letter from the North American Insulation Manufacturers Association (NAIMA). June 8, 2011 Letter.

variety of mineral materials, including chromium, and more specifically chromic oxide.¹¹

In a wool fiberglass glass-melting furnace, sufficient temperatures are reached to drive the transformation of chromium from the trivalent to the hexavalent valence state. Because of the corrosive properties of the molten glass and the fining agents (salts added to the top of the molten glass layer which act to draw the gas bubbles out of the molten glass), the refractory of the inner furnace walls are eroded and fresh refractory is continually exposed along the metal/glass line within the furnace. As a result, when the glass-melting furnace is constructed using refractories containing high percentages of chromium, the emission levels of chromium compounds continuously increase over the life of the furnace according to the increasingly exposed refractory surface area.^{12,13,14}

In addition, organic HAP (formaldehyde, phenol, and methanol) may be released from RS forming and curing processes and FA forming and curing processes.

¹¹ Chromium in Refractories. Sept. 2000. Dr. Mariano Velez, Ceramic Engineering Dept., Univ. Missouri-Rolla.

¹² Notes of April 14, 2011 telephone discussion between Carlos Davis, Environmental Manager, Certainteed, Kansas City, KS; and Susan Fairchild, project lead, USEPA/OAQPS/SPPD.

¹³ Region 7 Certainteed, Kansas City, KS; meeting and site visit notes.

¹⁴ Emissions Test Results from Certainteed, Kansas City, KS. 2005 and 2008.

The 1999 MACT rule applies to process emissions from each of the following existing, newly constructed, and reconstructed sources: glass-melting furnaces located at a wool fiberglass manufacturing plant, RS manufacturing lines that produce building insulation, and FA manufacturing lines producing pipe insulation. The MACT rule also applies to FA manufacturing lines producing heavy-density products.

The 1999 MACT rule requires control of PM emissions from the glass-melting furnaces and formaldehyde emissions from the RS and FA lines. Typical control devices to reduce PM and HAP emissions from furnaces include both wet and dry ESP and fabric filters. Low and high-temperature thermal oxidizers are used to control phenol, formaldehyde, and methanol from curing operations on bonded lines.

The 1999 MACT rule limits PM emissions to an outlet concentration of 0.50 lb of PM per ton of glass pulled for both existing and new furnaces, 40 CFR 63.1382. Emissions of formaldehyde from RS manufacturing lines are limited to an outlet concentration of 1.2 lb/ton of glass pulled for existing sources and 0.80 lb/ton of glass pulled for new sources. Emissions of formaldehyde from FA manufacturing lines producing pipe insulation are limited to an outlet concentration of 6.8 lb/ton of glass pulled from both existing and new sources, 40 CFR 63.1382. Emissions of formaldehyde from FA manufacturing

lines producing heavy-density products are limited to an outlet concentration of 7.8 lb/ton of glass pulled for new sources; no emission limit is specified for existing FA manufacturing lines producing heavy-density products, 40 CFR 63.1382. A surrogate approach, where PM serves as a surrogate for HAP metals and formaldehyde serves as a surrogate for organic HAP, was used in the 1999 MACT rule to allow for easier and less expensive testing and monitoring requirements.

The industry trade association has advised us that because the wool fiberglass industry has voluntarily phased out most uses of phenol-formaldehyde based binders, there may now be only two wool fiberglass facilities that are subject to the current MACT rule. If this is accurate, 27 of the 29 facilities manufacturing wool fiberglass may not be considered major sources due to the phaseout of phenol-formaldehyde based binders. We are soliciting comment on our understanding that there will be no major sources in the wool fiberglass insulation source category (other than pipe insulation products) by the end of the 2012 calendar year.

C. What data collection activities were conducted to support this action?

In June 2010, the industry conducted a voluntary survey among all companies that own and operate mineral wool production and wool fiberglass manufacturing facilities. The survey sought

test data for PM, CO and HAP emissions and information on the process equipment, control devices, point and fugitive emissions, practices used to control point and fugitive emissions, and other aspects of facility operations. Facilities were asked to seek and obtain prior EPA approval where new test data for a subset of processes, control devices and operations would be submitted as representative of an untested subset of processes, control devices and operations. In addition, facilities were allowed, in lieu of conducting new testing and with prior EPA approval, to submit existing and well-documented test data that were representative of current operations using the recommended test methods in the industry survey.

Furthermore, the EPA requested, and industry agreed, that a subset of the facilities that were thought to be representative of emission sources from both the mineral wool and wool fiberglass industries would conduct additional emissions testing for certain HAP from specific processes. The bases for representativeness included design type and size of process units or equipment; fuel type; operating temperatures; control devices; and raw material content. Facilities completed and submitted responses to the industry survey in the spring of 2011.

In summary, the EPA received existing emissions test data from all 7 mineral wool facilities and 26 of the 29 wool

fiberglass facilities, with some facilities submitting data for multiple years. Mineral wool facilities provided existing test data on cupolas, curing ovens, and collection operations. Wool fiberglass facilities provided existing test data on one or more of the following emission sources: glass-melting furnaces, curing ovens, forming, and collection operations. Emissions test data provided by facilities in both source categories, including the emission unit and pollutant tested, varied widely by facility.

The mineral wool industry included testing for most HAP metals, CO, PM and certain organic HAP (formaldehyde, phenol, methanol and COS). Pollutants tested for by the wool fiberglass manufacturing source category included most HAP metals, including chromium and hexavalent chromium, PM, formaldehyde, phenol and methanol. The EPA completed the dataset by assigning emission estimates from tested processes and their known production rates to the similar represented processes based on production rates at the untested processes. A copy of the dataset can be found in the docket to this proposed rule.

The results of these emission tests were compiled into a database for each source category, which is available in the docket for this action.

V. Analyses Performed

A. How did we estimate risks posed by the source categories?

The EPA conducted a risk assessment that provided estimates of (1) the MIR posed by the HAP emissions from the 7 mineral wool facilities and 29 wool fiberglass manufacturing facilities in the source categories, (2) the distribution of cancer risks within the exposed populations, (3) the total cancer incidence, (4) estimates of the maximum TOSHI for chronic exposures to HAP with the potential to cause chronic non-cancer health effects, (5) worst-case screening estimates of HQ for acute exposures to HAP with the potential to cause non-cancer health effects, and (6) an evaluation of the potential for adverse environmental effects. In June of 2009, the EPA's SAB conducted a formal peer review of the risk assessment methodologies used in its review of the document entitled, "Risk and Technology Review Assessment Methodologies."¹⁵ We received the final SAB report on this review in May of 2010.¹⁶ Where appropriate, we have responded to the key messages from this review in developing the current risk assessment; we will be continuing our efforts to improve our assessments by incorporating updates based on the SAB recommendations as they are developed and become available. The

¹⁵ US EPA, 2009. Risk and Technology Review (RTR) Risk Assessment Methodologies: For Review by the EPA's Science Advisory Board with Case Studies - MACT I Petroleum Refining Sources and Portland Cement Manufacturing. EPA-452/R-09-006. Available at: <http://www.epa.gov/ttn/atw/rrisk/rtrpg.html>.

¹⁶ US EPA, 2010. SAB's Response to EPA's RTR Risk Assessment Methodologies. Available at: [http://yosemite.epa.gov/sab/sabproduct.nsf/4AB3966E263D943A8525771F00668381/\\$File/EPA-SAB-10-007-unsigned.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/4AB3966E263D943A8525771F00668381/$File/EPA-SAB-10-007-unsigned.pdf).

risk assessment consisted of seven primary steps, as discussed below. The docket for this rulemaking contains the following document, which provides more information on the risk assessment inputs and models: Draft Residual Risk Assessment for the Mineral Wool Production and Wool Fiberglass Manufacturing Source Categories.

1. Establishing the Nature and Magnitude of Actual Emissions and Identifying the Emissions Release Characteristics.

For each facility in the Mineral Wool Production and Wool Fiberglass Manufacturing source categories, we developed and compiled an emissions profile (including emissions estimates, stack parameters, and location data) based on the information provided by the industry survey, the emissions test data, and various calculations. We used the production rates of tested processes to assign emissions to untested but similar processes based on known production rates at the untested processes. The site-specific emissions profiles include annual estimates of process emissions for the 2010 timeframe, as well as emissions release characteristics such as emissions release height, temperature, velocity, and location coordinates. We are requesting comment on the assumptions used to complete the dataset, including assumptions we made to assign emission rates.

The primary risk assessment is based on estimates of the actual emissions (though we also analyzed allowable emissions

and the potential risks due to allowable emissions). We received a substantial amount of emissions test data and other information from the industry survey that enabled us to derive estimates of stack emissions of certain HAP for all of the facilities in both source categories. The wool fiberglass industry provided emission testing on all known pollutants, including total chromium and hexavalent chromium, PM, and other metals at furnaces they considered to be representative of other furnaces operated by the company. Where different furnace types were used to melt fiberglass, industry usually tested representative furnaces for each furnace type. The representative furnaces were chosen by industry according to production rates and furnace type. For untested furnaces, industry provided the normal operating rate in terms of tons of glass produced per hour. We estimated emissions at untested furnaces by using data from the representative tested furnaces. To do this, we used test data from representative furnaces that provided emissions rates of all tested pollutants on a pound per hour basis. We applied this pound per hour basis to the untested furnaces with the known production rates of those furnaces to estimate pounds per hour of pollutants. We considered furnace type and company when making these assignments.

We consider these estimates to be very good because they are based upon known emission test methods, have test reports

that verify the results, were signed as being true and accurate by authorized company representatives, and also signed as being accurate by the testing company. In addition, one testing company was used by the industry to conduct all the emissions testing using approved EPA methods. We are requesting comment on our use of the available test data to assign emission estimates to untested emission points.

2. Establishing the Relationship between Actual Emissions and MACT-Allowable Emissions Levels.

The emissions data in our data set consists of actual stack emissions and, where we did not have actual emissions data, estimates of emissions based on a subset of operations that were representative of such emission points. In the EPA's experience, with most source categories, we generally have found that "actual" emissions levels are lower than the emissions levels that a facility is allowed to emit under the MACT standards. The emissions levels allowed to be emitted by the MACT standards are referred to as the "MACT-allowable" emissions levels. This represents the highest emissions level that could be emitted by facilities without violating the MACT standards.

As we discussed in prior residual risk and technology review rules, assessing the risks at the MACT-allowable level is reasonable since these risks reflect the maximum level at which sources could emit while still complying with the MACT

standards. However, we also explained that it is reasonable to consider actual emissions, where such data are available, in both steps of the risk analysis, in accordance with the Benzene NESHAP (54 FR 38044, September 14, 1989). Considering actual emissions is reasonable because source categories typically seek to perform better than required by emissions standards to provide an operational cushion and to accommodate the variability in manufacturing processes and control device performance. Facilities' actual emissions may also be significantly lower than MACT-allowable emissions for other reasons such as State requirements, improvements in performance of control devices since by the MACT standards, or reduced production. In this case, we are reducing the allowable emissions limits to the levels of actual emissions. For this reason, for the pollutants emitted, we are using only actual emissions in our risk analysis.

For both the Mineral Wool Production and Wool Fiberglass Manufacturing source categories, we evaluated actual and allowable stack emissions. Appendices 1a and 1b of the Draft Residual Risk Assessment for the Mineral Wool Production and Wool Fiberglass Manufacturing Source Categories, available in the docket, further describe the estimates of MACT-allowable emissions and the estimates of risks due to allowable emissions.

a. Actual and allowable emissions for the Mineral Wool Production source category.

The analysis of allowable emissions for the Mineral Wool Production source category was largely focused on formaldehyde emissions, which we considered the most important HAP emitted from this source category based on our screening level risk assessment and the HAP for which we had the most data. However, we also considered allowable emissions for other HAP, including HAP metals and COS. To estimate the difference between the actual and allowable emissions, we averaged the actual formaldehyde emission rates of manufacturing lines provided by facilities and compared those values to the maximum level allowed by the existing MACT standard (i.e., 0.06 pounds of formaldehyde per ton of melt) from all curing ovens.

We realize that these estimates of allowable emissions are theoretical high-end estimates as facilities must maintain average emissions levels at some level below the MACT limit to ensure compliance with the standard at all times because of the day-to-day variability in emissions. Nevertheless, these high-end estimates of allowable emissions were adequate for us to estimate the magnitude of allowable emissions and the differences between the estimates of actual emissions and the MACT allowable emissions.

Based on this analysis, we conclude that all facilities in the mineral wool source category are emitting formaldehyde at levels lower than allowable and that the differences between actual and allowable emissions are significant. For the facilities producing bonded product, the estimated actual emissions were up to three times lower than allowable emissions. That is, MACT-allowable emissions were determined to be three times the actual emissions for all pollutants in the Mineral Wool Production category. Therefore, we multiplied the actual stack emissions from each facility by a factor of 3 to derive estimates of allowable emissions for modeling (whether these emissions were measured by testing or calculated based on representative emission tests).

b. Analysis of allowable and actual emissions for the Wool Fiberglass Manufacturing source category.

The analysis of allowable emissions for the Wool Fiberglass Manufacturing source category was largely focused on emissions of chromium compounds and formaldehyde because these are the only pollutants emitted with significant health risks. To estimate the difference between the actual and allowable emissions, we averaged the actual formaldehyde emission rates of manufacturing lines provided by facilities and compared those values to the maximum level allowed by the existing MACT

standard (i.e., 1.2 or 0.8 lb/ton of glass pulled for formaldehyde).

We realize that these estimates of allowable emissions are theoretical high-end estimates as facilities must maintain average emissions levels at some level below the MACT limit to ensure compliance with the standard at all times because of the day-to-day variability in emissions. Nevertheless, these high-end estimates of allowable emissions were adequate for us to estimate the magnitude of allowable emissions and the differences between the estimates of actual emissions and the MACT allowable emissions. Based on this analysis, we conclude that allowable emissions are estimated to be three times higher than actual emissions. Therefore, to develop the MACT-allowable emissions, the actual stack emissions for formaldehyde, phenol and methanol were multiplied by a factor of 3. The range of differences between actual and allowable formaldehyde emission levels is significant, that is, for some sources there was little difference between actual and allowable emission levels, other times, allowable emissions were up to 5 times greater than actual emissions. MACT-allowable emissions for chromium compounds were determined to be equal to actual emissions since there is currently no emissions limit for chromium compounds.

3. Conducting Dispersion Modeling, Determining Inhalation Exposures, and Estimating Individual and Population Inhalation Risks.

Both long-term and short-term inhalation exposure concentrations and health risks from each source in both the source categories addressed in this proposal were estimated using the HEM (Community and Sector HEM-3 version 2.1 Beta). The HEM-3 performs three primary risk assessment activities: (1) Conducting dispersion modeling to estimate the concentrations of HAP in ambient air, (2) estimating long-term and short-term inhalation exposures to individuals residing within 50 km of the modeled sources, and (3) estimating individual and population-level inhalation risks using the exposure estimates and quantitative dose-response information.

The dispersion model used by HEM-3 is AERMOD, which is one of the EPA's preferred models for assessing pollutant concentrations from industrial facilities.¹⁷ HEM-3 draws on three data libraries to perform the dispersion modeling and to develop the preliminary risk estimates. The first is a library of meteorological data, which is used for dispersion calculations. This library includes 1 year of hourly surface and upper air

¹⁷ U.S. EPA. Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions (70 FR 68218, November 9, 2005).

observations for more than 200 meteorological stations, selected to provide coverage of the United States and Puerto Rico. A second library of United States Census Bureau census block¹⁸ internal point locations and populations provides the basis of human exposure calculations (Census, 2000). In addition, for each census block, the Census library includes the elevation and controlling hill height, which are used in dispersion calculations. A third library of pollutant unit risk factors and other health benchmarks is used to estimate health risks. These risk factors and health benchmarks are the latest values recommended by the EPA for HAP and other toxic air pollutants. These values are available at <http://www.epa.gov/ttn/atw/toxsource/summary.html> and are discussed in more detail later in this section.

In developing the risk assessment for chronic exposures, we used the estimated annual average ambient air concentration of each of the HAP emitted by each source for which we have emissions data in the source category. The air concentrations at each nearby census block centroid were used as a surrogate for the chronic inhalation exposure concentration for all the people who reside in that census block. We calculated the MIR for each facility as the cancer risk associated with a continuous

¹⁸ A census block is generally the smallest geographic area for which census statistics are tabulated.

lifetime exposure (24 hours per day, 7 days per week, and 52 weeks per year for a 70-year period) to the maximum concentration at the centroid of an inhabited census block. Individual cancer risks were calculated by multiplying the estimated lifetime exposure to the ambient concentration of each of the HAP (in micrograms per cubic meter) by its URE, which is an upper bound estimate of an individual's probability of contracting cancer over a lifetime of exposure to a concentration of 1 microgram of the pollutant per cubic meter of air. For residual risk assessments, we generally use URE values from the EPA's Integrated Risk Information System (IRIS). For carcinogenic pollutants without an EPA IRIS value, we look to other reputable sources of cancer dose-response values, often using CalEPA URE values, where available. We may use dose-response values in place of or in addition to other values, if appropriate, in cases where new, scientifically credible dose-response values have been developed in a manner consistent with the EPA guidelines and have undergone a peer review process similar to that used by the EPA.

With regard to formaldehyde, the EPA determined in 2004 that the CIIT cancer dose-response value for formaldehyde (5.5×10^{-9} per $\mu\text{g}/\text{m}^3$) was based on better science than the IRIS cancer dose-response value (1.3×10^{-5} per $\mu\text{g}/\text{m}^3$) and we switched from using the IRIS value to the CIIT value in risk assessments

supporting regulatory actions. Based on subsequent published research, however, EPA changed its determination regarding the CIIT model and in 2010 the EPA returned to using the 1991 IRIS value. The EPA has been working on revising the formaldehyde IRIS assessment and the NAS completed its review of the EPA's draft in May of 2011. The EPA is reviewing the public comments and the NAS independent scientific peer review. The EPA will follow the NAS Report recommendations and will present results obtained by implementing the biologically based dose-response (BBDR) model for formaldehyde. The EPA will compare these estimates with those currently presented in the External Review draft of the assessment and will discuss their strengths and weaknesses. As recommended by the NAS committee, appropriate sensitivity and uncertainty analyses will be an integral component of implementing the BBDR model. The draft IRIS assessment will be revised in response to the NAS peer review and public comments and the final assessment will be posted on the IRIS database. In the interim, we will present findings using the 1991 IRIS value as a primary estimate, and may also consider other information as the science evolves. As described in the risk assessment, the IRIS URE for formaldehyde is 1.3×10^{-5} ug/m³, whereas, the CIIT URE for formaldehyde is 5.5×10^{-9} ug/m³.

Incremental individual lifetime cancer risks associated with emissions from the source category were estimated as the sum of the risks for each of the carcinogenic HAP (including those classified as carcinogenic to humans, likely to be carcinogenic to humans and suggestive evidence of carcinogenic potential¹⁹) emitted by the modeled source. Cancer incidence and the distribution of individual cancer risks for the population within 50 km of any source were also estimated for the source category as part of these assessments by summing individual risks. A distance of 50 km is consistent with both the analysis supporting the 1989 Benzene NESHAP (54 FR 38044) and the limitations of Gaussian dispersion models, including AERMOD.

To assess risk of noncancer health effects from chronic exposures, we summed the HQ for each of the HAP that affects a common target organ system to obtain the HI for that target organ system (or TOSHI). The HQ for chronic exposures is the estimated chronic exposure divided by the chronic reference

¹⁹ These classifications also coincide with the terms "known carcinogen, probable carcinogen and possible carcinogen," respectively, which are the terms advocated in the EPA's previous Guidelines for Carcinogen Risk Assessment, published in 1986 (51 FR 33992, September 24, 1986). Summing the risks of these individual compounds to obtain the cumulative cancer risks is an approach that was recommended by the EPA's SAB in their 2002 peer review of EPA's NATA entitled, NATA - Evaluating the National-scale Air Toxics Assessment 1996 Data -- an SAB Advisory, available at: [http://yosemite.epa.gov/sab/sabproduct.nsf/214C6E915BB04E14852570CA007A682C/\\$File/ecadv02001.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/214C6E915BB04E14852570CA007A682C/$File/ecadv02001.pdf).

level, which is either the EPA RfC, defined as "an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime," or, in cases where an RfC from the EPA's IRIS database is not available, the EPA will utilize the following prioritized sources for our chronic dose-response values: (1) The Agency for Toxic Substances and Disease Registry Minimum Risk Level, which is defined as "an estimate of daily human exposure to a substance that is likely to be without an appreciable risk of adverse effects (other than cancer) over a specified duration of exposure"; (2) the CalEPA Chronic REL, which is defined as "the concentration level at or below which no adverse health effects are anticipated for a specified exposure duration"; and (3), as noted above, in cases where scientifically credible dose-response values have been developed in a manner consistent with the EPA guidelines and have undergone a peer review process similar to that used by the EPA, we may use those dose-response values in place of or in concert with other values.

Screening estimates of acute exposures and risks were also evaluated for each of the HAP at the point of highest off-site exposure for each facility (i.e., not just the census block centroids), assuming that a person is located at this spot at a

time when both the peak (hourly) emission rate and worst-case dispersion conditions (1991 calendar year data) occur. The acute HQ is the estimated acute exposure divided by the acute dose-response value. In each case, acute HQ values were calculated using best available, short-term dose-response values. These acute dose-response values, which are described below, include the acute REL, AEGL and ERPG for 1-hour exposure durations. As discussed below, we used conservative assumptions for emission rates, meteorology and exposure location for our acute analysis.

As described in the CalEPA's Air Toxics Hot Spots Program Risk Assessment Guidelines, Part I, The Determination of Acute Reference Exposure Levels for Airborne Toxicants, an acute REL value (<http://www.oehha.ca.gov/air/pdf/acuterel.pdf>) is defined as "the concentration level at or below which no adverse health effects are anticipated for a specified exposure duration." Acute REL values are based on the most sensitive, relevant, adverse health effect reported in the medical and toxicological literature. Acute REL values are designed to protect the most sensitive individuals in the population by the inclusion of margins of safety. Since margins of safety are incorporated to address data gaps and uncertainties, exceeding the acute REL does not automatically indicate an adverse health impact.

AEGL values were derived in response to recommendations from the NRC. As described in Standing Operating Procedures of

the National Advisory Committee on Acute Exposure Guideline Levels for Hazardous Substances

(<http://www.epa.gov/opptintr/aegl/pubs/sop.pdf>),²⁰ "the NRC's previous name for acute exposure levels—community emergency exposure levels—was replaced by the term AEGL to reflect the broad application of these values to planning, response, and prevention in the community, the workplace, transportation, the military, and the remediation of Superfund sites." This document also states that AEGL values "represent threshold exposure limits for the general public and are applicable to emergency exposures ranging from 10 minutes to 8 hours." The document lays out the purpose and objectives of AEGL by stating (page 21) that "the primary purpose of the AEGL program and the National Advisory Committee for Acute Exposure Guideline Levels for Hazardous Substances is to develop guideline levels for once-in-a-lifetime, short-term exposures to airborne concentrations of acutely toxic, high-priority chemicals." In detailing the intended application of AEGL values, the document states (page 31) that "[i]t is anticipated that the AEGL values will be used for regulatory and nonregulatory purposes by U.S. Federal and state agencies and possibly the international community in conjunction with chemical emergency response, planning and

²⁰ NAS, 2001. Standing Operating Procedures for Developing Acute Exposure Levels for Hazardous Chemicals, page 2.

prevention programs. More specifically, the AEGL values will be used for conducting various risk assessments to aid in the development of emergency preparedness and prevention plans, as well as real-time emergency response actions, for accidental chemical releases at fixed facilities and from transport carriers."

The AEGL-1 value is then specifically defined as "the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure." The document also notes (page 3) that, "Airborne concentrations below AEGL-1 represent exposure levels that can produce mild and progressively increasing but transient and nondisabling odor, taste, and sensory irritation or certain asymptomatic, nonsensory effects." Similarly, the document defines AEGL-2 values as "the airborne concentration (expressed as ppm or mg/m³) of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape."

ERPG values are derived for use in emergency response, as described in the American Industrial Hygiene Association's

document entitled, Emergency Response Planning Guidelines (ERPG) Procedures and Responsibilities

(<http://www.aiha.org/1documents/committees/ERPSOPs2006.pdf>)

which states that, "Emergency Response Planning Guidelines were developed for emergency planning and are intended as health based guideline concentrations for single exposures to chemicals."²¹ The ERPG-1 value is defined as "the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient adverse health effects or without perceiving a clearly defined, objectionable odor." Similarly, the ERPG-2 value is defined as "the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action."

As can be seen from the definitions above, the AEGL and ERPG values include the similarly-defined severity levels 1 and 2. For many chemicals, a severity level 1 value AEGL or ERPG has not been developed; in these instances, higher severity level

²¹ ERP Committee Procedures and Responsibilities. November 1, 2006. American Industrial Hygiene Association.

AEGL-2 or ERPG-2 values are compared to our modeled exposure levels to screen for potential acute concerns.

Acute REL values for 1-hour exposure durations are typically lower than their corresponding AEGL-1 and ERPG-1 values. Even though their definitions are slightly different, AEGL-1 values are often the same as the corresponding ERPG-1 values, and AEGL-2 values are often equal to ERPG-2 values. Maximum HQ values from our acute screening risk assessments typically result when basing them on the acute REL value for a particular pollutant. In cases where our maximum acute HQ value exceeds 1, we also report the HQ value based on the next highest acute dose-response value (usually the AEGL-1 and/or the ERPG-1 value).

To develop screening estimates of acute exposures, we developed estimates of maximum hourly emission rates by multiplying the average actual annual hourly emission rates by a factor to cover routinely variable emissions. We chose the factor based on process knowledge and engineering judgment and with awareness of a Texas study of short-term emissions variability, which showed that most peak emission events, in a heavily-industrialized four county area (Harris, Galveston, Chambers and Brazoria Counties, Texas) were less than twice the annual average hourly emission rate. The highest peak emission event was 74 times the annual average hourly emission rate, and

the 99th percentile ratio of peak hourly emission rate to the annual average hourly emission rate was 9.²² This analysis is provided in Appendix 4 of the Draft Residual Risk Assessment for the Mineral Wool Production and Wool Fiberglass Manufacturing Source Categories, which is available in the docket for this action. Considering this analysis, unless specific process knowledge or data are available to provide an alternate value, to account for more than 99 percent of the peak hourly emissions, we apply a conservative screening multiplication factor of 10 to the average annual hourly emission rate in these acute exposure screening assessments. The factor of 10 was used for the Wool Fiberglass Manufacturing source category, but we determined that a factor of 3 is more appropriate for the Mineral Wool Production source category (for more details see the Acute Effects Factor for Mineral Wool Manufacturing Operations document in the docket for this rulemaking).

For the mineral wool source category, we used data from the highest formaldehyde emitting source among the mineral wool producers. That company also presented the highest risk due to formaldehyde emissions. This company provided the agency with 10 years of measurements of binder formulation, formaldehyde content in binders, binder application rates, and binder

²² See http://www.tceq.state.tx.us/compliance/field_ops/eer/index.html or docket to access the source of these data.

retention rates. Because the industry must manufacture their product for use in fireproofing, they must keep meticulous records of production specifics. These data are used to show compliance with Underwriters Laboratories and other building construction safety standards. From this specific 10-year data set, the EPA determined that, on a worst-case possible basis, formaldehyde could be emitted at levels no more than three times the actual rate. The worst-case scenario is possible if the binder contained the maximum amount of resin possible, the resin contained the maximum amount of formaldehyde possible, was sprayed at the maximum rate possible, and retained in the product at the minimum level possible. These data were used to in the risk assessment to determine the acute health effects hazard index. For Mineral Wool Production, the plant-specific acute factors were calculated and ranged from 1.0 to 1.6. Based on these results, and to allow for additional uncertainty in emissions, we used an acute factor of 3.0. The calculation we used to determine this acute factor is available in the docket to this rule.²³

In cases where acute HQ values from the screening step were less than or equal to 1, acute impacts were deemed negligible and no further analysis was performed. In cases where an acute

²³ Acute Factor Memo. Cindy Hancy and David Reeves, RTI; to Susan Fairchild, USEPA/OAQPS/SPPD; EPA Project Lead. August 30, 2011.

HQ from the screening step was greater than 1, additional site-specific data were considered to develop a more refined estimate of the potential for acute impacts of concern. The data refinements employed for these source categories consisted of using the site-specific facility layout to distinguish facility property from an area where the public could be exposed. These refinements are discussed in the draft risk assessment document, which is available in the docket for each of these source categories. Ideally, we would prefer to have continuous measurements over time to see how the emissions vary each hour over an entire year. Having a frequency distribution of hourly emission rates over a year would allow us to perform a probabilistic analysis to estimate potential threshold exceedances and their frequency of occurrence. Such an evaluation could include a more complete statistical treatment of the key parameters and elements adopted in this screening analysis. However, we recognize that having this level of data is rare, hence our use of the multiplier approach.

To better characterize the potential health risks associated with estimated worst-case acute exposures to HAP, and in response to a key recommendation from the SAB's peer review of EPA's RTR risk assessment methodologies²⁴, we examine a wider

²⁴ The SAB peer review of RTR Risk Assessment Methodologies is available at:

range of available acute health metrics than we do for our chronic risk assessments. This is in response to the acknowledgement that there are generally more data gaps and inconsistencies in acute reference values than there are in chronic reference values. By definition, the acute CA-REL represents a health-protective level of exposure, with no risk anticipated below those levels, even for repeated exposures; however, the health risk from higher-level exposures is unknown. Therefore, when a CA-REL is exceeded and an AEGL-1 or ERPG-1 level is available (i.e., levels at which mild effects are anticipated in the general public for a single exposure), we have used them as a second comparative measure. Historically, comparisons of the estimated maximum off-site one-hour exposure levels have not been typically made to occupational levels for the purpose of characterizing public health risks in RTR assessments. This is because occupational ceiling values are not generally considered protective for the general public since they are designed to protect the worker population (presumed healthy adults) for short duration (<15 minute) increases in exposure²⁵. As a result, for most chemicals, the 15-minute

[http://yosemite.epa.gov/sab/sabproduct.nsf/4AB3966E263D943A8525771F00668381/\\$File/EPA-SAB-10-007-unsigned.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/4AB3966E263D943A8525771F00668381/$File/EPA-SAB-10-007-unsigned.pdf)

²⁵ U.S. EPA. (2009) Chapter 2.9 Chemical Specific Reference Values for Formaldehyde in Graphical Arrays of Chemical-Specific Health Effect Reference Values for Inhalation Exposures (Final Report). U.S. Environmental Protection Agency, Washington, DC,

occupational ceiling values are set at levels higher than a one-hour AEGL-1, making comparisons to them irrelevant unless the AEGL-1 or ERPG-1 levels are exceeded (US EPA 2009). Such is not the case when comparing the available acute inhalation health effect reference values for formaldehyde (US EPA 2009).

The worst-case maximum estimated 1-hour exposure to formaldehyde outside the facility fence line for the mineral wool source category is 0.47 mg/m^3 . This estimated worst-case exposure exceeds the 1-hour REL by a factor of 8 ($HQ_{REL} = 8$) and is below the 1-hour AEGL-1 ($HQ_{AEGL-1} = 0.4$). This exposure estimate does not exceed the AEGL-1, or exceed the workplace ceiling level guideline for the formaldehyde value developed by the NIOSH²⁶ "for any 15 minute period in a work day" (NIOSH REL-ceiling value of 0.12 mg/m^3 ; $HQ_{NIOSH} = 4$). The estimate is at the value developed by the ACGIH as "not to be exceeded at any time" (ACGIH TLV-ceiling value of 0.37 mg/m^3 ; $HQ_{ACGIH} = 1$). Additionally, the estimated maximum acute exposure exceeds the Air Quality Guideline value that was developed by the World

EPA/600/R-09/061, and available on-line at
<http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=211003>

²⁶ National Institutes for Occupational Safety and Health (NIOSH). Occupational Safety and Health Guideline for Formaldehyde; <http://www.cdc.gov/niosh/docs/81-123/pdfs/0293.pdf>

Health Organization²⁷ for 30-minute exposures (0.1 mg/m^3 ; $HQ_{\text{WHO}} = 5$).

For the wool fiberglass manufacturing source category, the worst-case maximum estimated 1-hour exposure to formaldehyde outside the facility fence line is 1.92 mg/m^3 . This estimated worst-case exposure exceeds the 1-hour REL by a factor of 30 ($HQ_{\text{REL}} = 30$) and the 1-hour AEGL-1 ($HQ_{\text{AEGL-1}} = 2$). This exposure estimate also exceeds multiple workplace ceiling level guidelines for formaldehyde, including the value developed by the American Conference of Governmental Industrial Hygienists (ACGIH) as "not to be exceeded at any time" (ACGIH TLV-ceiling value of 0.37 mg/m^3 ; $HQ_{\text{ACGIH}} = 5$), and the value developed by the National Institutes for Occupational Safety and Health (NIOSH) "for any 15 minute period in a work day" (NIOSH REL-ceiling value of 0.12 mg/m^3 ; $HQ_{\text{NIOSH}} = 16$). Additionally, the estimated maximum acute exposure exceeds the Air Quality Guideline value that was developed by the World Health Organization²⁸ for 30-minute exposures (0.1 mg/m^3 ; $HQ_{\text{WHO}} = 19$). Id.

²⁷ WHO (2000). Chapter 5.8 Formaldehyde, in Air Quality Guidelines for Europe, second edition. World Health Organization Regional Publications, European Series, No. 91. Copenhagen, Denmark. Available on-line at http://www.euro.who.int/data/assets/pdf_file/0005/74732/E71922.pdf.

²⁸ WHO (2000). Chapter 5.8 Formaldehyde, in Air Quality Guidelines for Europe, second edition. World Health Organization Regional Publications, European Series, No. 91. Copenhagen, Denmark. Available on-line at

We solicit comment on the use of the occupational values described above in the interpretation of these worst-case acute screening exposure estimates for both the Mineral Wool Production and Wool Fiberglass Manufacturing source categories.

4. Conducting Multipathway Exposure and Risk Modeling.

The potential for significant human health risks due to exposures via routes other than inhalation (i.e., multi-pathway exposures) and the potential for adverse environmental impacts were evaluated in a three-step process. In the first step, we determined whether any facilities emitted any PB-HAP in the environment. There are 14 PB-HAP compounds or compound classes identified for this screening in the EPA's Air Toxics Risk Assessment Library (available at http://www.epa.gov/ttn/fera/risk_atra_vol1.html). They are cadmium compounds, chlordane, chlorinated dibenzodioxins and furans, dichlorodiphenyldichloroethylene, heptachlor, hexachlorobenzene, hexachlorocyclohexane, lead compounds, mercury compounds, methoxychlor, polychlorinated biphenyls, polycyclic organic matter, toxaphene and trifluralin.

Since three of these PB-HAP (lead, cadmium, and mercury compounds) are emitted by at least one facility in both source categories, we proceeded to the second step of the evaluation.

http://www.euro.who.int/data/assets/pdf_file/0005/74732/E71922.pdf.

In this step, we determined whether the facility-specific emission rates of each of the emitted PB-HAP were large enough to create the potential for significant non-inhalation human or environmental risks under reasonable worst-case conditions. To facilitate this step, we developed emission rate thresholds for each PB-HAP using a hypothetical worst-case screening exposure scenario developed for use in conjunction with the EPA's TRIM.FaTE model. The hypothetical screening scenario was subjected to a sensitivity analysis to ensure that its key design parameters were established such that environmental media concentrations were not underestimated (i.e., to minimize the occurrence of false negatives or results that suggest that risks might be acceptable when, in fact, actual risks are high) and to also minimize the occurrence of false positives for human health endpoints. We call this application of the TRIM.FaTE model TRIM-Screen. The facility-specific emission rates of each of the PB-HAP in each source category were compared to the TRIM-Screen emission threshold values for each of the PB-HAP identified in the source category datasets to assess the potential for significant human health risks or environmental risks via non-inhalation pathways.

None of the facilities in the Mineral Wool Production and Wool Fiberglass Manufacturing source categories reported emissions of PB-HAP that were greater than the *de minimis*

threshold levels, indicating no potential for significant multi-pathway risks from these facilities. Therefore, multi-pathway exposures and environmental risks were deemed negligible and no further analysis was performed. This analysis is provided in the Draft Residual Risk Assessment for the Mineral Wool Production and Wool Fiberglass Manufacturing Source Categories, which is available in the docket for this action.

5. Assessing Risks After Control Options.

In addition to assessing baseline inhalation risks and screening for potential multi-pathway risks, where appropriate, we also estimated risks considering the potential emission reductions that would be achieved by the particular control options under consideration. In these cases, the expected emissions reductions were applied to the specific HAP and emissions sources in the source category dataset to develop corresponding estimates of risk reductions. More information on the risks remaining after controls are in place to meet the emissions limits is available in the Draft Residual Risk Assessment for the Mineral Wool Production and Wool fiberglass Manufacturing Source Categories, which is available in the docket for this action.

6. Conducting Facility Wide Risk Assessments

To put the source category risks in context, we also examine the risks from the entire "facility," where the facility

includes all HAP-emitting operations within a contiguous area and under common control. In other words, for each facility that includes one or more sources from one of the source categories under review, we examine the HAP emissions not only from the source category of interest, but also from all other emission sources at the facility. For both source categories, all significant HAP sources have been included in the source category risk analysis and there are no other significant HAP emissions sources present. Therefore, we conclude that the facility wide risk is essentially the same as the source category risk for both the mineral wool and wool fiberglass source categories and that no separate facility wide analysis is necessary.

7. Considering Uncertainties in Risk Assessment.

Uncertainty and the potential for bias are inherent in all risk assessments, including those performed for the source categories addressed in this proposal. Although uncertainty exists, we believe that our approach, which uses conservative tools and assumptions, ensures that our decisions are health-protective. A brief discussion of the uncertainties in the emissions datasets, dispersion modeling, inhalation exposure estimates and dose-response relationships follows below. A more thorough discussion of these uncertainties is included in the

draft risk assessment documentation (referenced earlier) available in the docket for this action.

a. Uncertainties in the Emissions Datasets.

Although the development of the MACT datasets involved quality assurance/quality control processes, the accuracy of emissions values will vary depending on the source of the data, the degree to which data are incomplete or missing, the degree to which assumptions made to complete the datasets are inaccurate, errors in estimating emissions values and other factors. The emission estimates considered in this analysis generally are annual totals for certain years that do not reflect short-term fluctuations during the course of a year or variations from year to year.

The estimates of peak hourly emission rates for the acute effects screening assessment were based on a multiplication factor of 10 applied to the average annual hourly emission rate, which is intended to account for emission fluctuations due to normal facility operations.

b. Uncertainties in Dispersion Modeling.

While the analysis employed the EPA's recommended regulatory dispersion model, AERMOD, we recognize that there is uncertainty in ambient concentration estimates associated with any model, including AERMOD. In circumstances where we had to choose between various model options, where possible, model options

(e.g., rural/urban, plume depletion, chemistry) were selected to provide an overestimate of ambient air concentrations of the HAP rather than underestimates. However, because of practicality and data limitation reasons, some factors (e.g., meteorology, building downwash) have the potential in some situations to overestimate or underestimate ambient impacts. For example, meteorological data were taken from a single year (1991) and facility locations can be a significant distance from the site where these data were taken. Despite these uncertainties, we believe that the approach considered in the dispersion modeling analysis for off-site locations and census block centroids should generally yield overestimates of ambient HAP concentrations.

c. Uncertainties in Inhalation Exposure.

The effects of human mobility on exposures were not included in the assessment. Specifically, short-term mobility and long-term mobility between census blocks in the modeling domain were not considered.²⁹ The assumption of not considering short- or long-term population mobility does not bias the estimate of the theoretical MIR, nor does it affect the estimate of cancer incidence since the total population number remains

²⁹ Short-term mobility is movement from one micro-environment to another over the course of hours or days. Long-term mobility is movement from one residence to another over the course of a lifetime.

the same. It does, however, affect the shape of the distribution of individual risks across the affected population, shifting it toward higher estimated individual risks at the upper end and reducing the number of people estimated to be at lower risks, thereby increasing the estimated number of people at specific risk levels.

In addition, the assessment predicted the chronic exposures at the centroid of each populated census block as surrogates for the exposure concentrations for all people living in that block. Using the census block centroid to predict chronic exposures tends to over-predict exposures for people in the census block who live further from the facility, and under-predict exposures for people in the census block who live closer to the facility. Thus, using the census block centroid to predict chronic exposures may lead to a potential understatement or overstatement of the true maximum impact, but is an unbiased estimate of average risk and incidence.

The assessments evaluate the cancer inhalation risks associated with continuous pollutant exposures over a 70-year period, which is the assumed lifetime of an individual. In reality, both the length of time that modeled emissions sources at facilities actually operate (i.e., more or less than 70 years), and the domestic growth or decline of the modeled industry (i.e., the increase or decrease in the number or size

of United States facilities), will influence the risks posed by a given source category. Depending on the characteristics of the industry, these factors will, in most cases, result in an overestimate both in individual risk levels and in the total estimated number of cancer cases. However, in rare cases, where a facility maintains or increases its emission levels beyond 70 years, residents live beyond 70 years at the same location, and the residents spend most of their days at that location, then the risks could potentially be underestimated. Annual cancer incidence estimates from exposures to emissions from these sources would not be affected by uncertainty in the length of time emissions sources operate.

The exposure estimates used in these analyses assume chronic exposures to ambient levels of pollutants. Because most people spend the majority of their time indoors, actual exposures may not be as high, depending on the characteristics of the pollutants modeled. For many of the HAP, indoor levels are roughly equivalent to ambient levels, but for very reactive pollutants or larger particles, these levels are typically lower. This factor has the potential to result in an overstatement of 25 to 30 percent of exposures.³⁰

³⁰ U.S. EPA. National-Scale Air Toxics Assessment for 1996. (EPA 453/R-01-003; January 2001; page 85.)

In addition to the uncertainties highlighted above, there are several factors specific to the acute exposure assessment that should be highlighted. The accuracy of an acute inhalation exposure assessment depends on the simultaneous occurrence of independent factors that may vary greatly, such as hourly emissions rates, meteorology, and human activity patterns. In this assessment, we assume that individuals remain for 1 hour at the point of maximum ambient concentration as determined by the co-occurrence of peak emissions and worst-case meteorological conditions. These assumptions would tend to overestimate actual exposures since it is unlikely that a person would be located at the point of maximum exposure during the time of worst-case impact.

d. Uncertainties in Dose-Response Relationships.

There are uncertainties inherent in the development of the dose-response values used in our risk assessments for cancer effects from chronic exposures and noncancer effects from both chronic and acute exposures. Some uncertainties may be considered quantitatively, and others generally are expressed in qualitative terms. We note as a preface to this discussion a point on dose-response uncertainty that is brought out in the EPA 2005 Cancer Guidelines; namely, that "the primary goal of the EPA actions is protection of human health; accordingly, as an agency policy, risk assessment procedures, including default

options that are used in the absence of scientific data to the contrary, should be health protective." (EPA 2005 Cancer Guidelines, pages 1-7). This is the approach followed here as summarized in the next several paragraphs. A complete detailed discussion of uncertainties and variability in dose-response relationships is given in the residual risk documentation, which is available in the docket for this action.

Cancer URE values used in our risk assessments are those that have been developed to generally provide an upper bound estimate of risk. That is, they represent a "plausible upper limit to the true value of a quantity" (although this is usually not a true statistical confidence limit).³¹ In some circumstances, the true risk could be as low as zero; however, in other circumstances, the risk could also be greater.³² When developing an upper bound estimate of risk and to provide risk values that do not underestimate risk, health-protective default approaches are generally used. To err on the side of ensuring adequate health-protection, the EPA typically uses the upper bound estimates rather than lower bound or central tendency estimates in our risk assessments, an approach that may have

³¹ IRIS glossary (http://www.epa.gov/NCEA/iris/help_gloss.htm).

³² An exception to this is the URE for benzene, which is considered to cover a range of values, each end of which is considered to be equally plausible and which is based on maximum likelihood estimates.

limitations for other uses (e.g., priority-setting or expected benefits analysis).

Chronic noncancer reference (RfC and RfD) values represent chronic exposure levels that are intended to be health-protective levels. Specifically, these values provide an estimate (with uncertainty spanning perhaps an order of magnitude) of daily oral exposure (RfD) or of a continuous inhalation exposure (RfC) to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. To derive values that are intended to be "without appreciable risk," the methodology relies upon an UF approach (U.S. EPA, 1993, 1994) which includes consideration of both uncertainty and variability. When there are gaps in the available information, UF are applied to derive reference values that are intended to protect against appreciable risk of deleterious effects. The UF are commonly default values,³³ e.g., factors of 10 or 3, used in

³³ According to the NRC report, Science and Judgment in Risk Assessment (NRC, 1994) "[Default] options are generic approaches, based on general scientific knowledge and policy judgment, that are applied to various elements of the risk assessment process when the correct scientific model is unknown or uncertain." The 1983 NRC report, Risk Assessment in the Federal Government: Managing the Process, defined default option as "the option chosen on the basis of risk assessment policy that appears to be the best choice in the absence of data to the contrary" (NRC, 1983a, p. 63). Therefore, default options are not rules that bind the agency; rather, the agency may depart from them in evaluating the risks posed by a

the absence of compound-specific data; where data are available, UF may also be developed using compound-specific information. When data are limited, more assumptions are needed and more UF are used. Thus, there may be a greater tendency to overestimate risk in the sense that further study might support development of reference values that are higher (i.e., less potent) because fewer default assumptions are needed. However, for some pollutants, it is possible that risks may be underestimated. While collectively termed "uncertainty factor," these factors account for a number of different quantitative considerations when using observed animal (usually rodent) or human toxicity data in the development of the RfC. The UF are intended to account for: (1) variation in susceptibility among the members of the human population (i.e., inter-individual variability); (2) uncertainty in extrapolating from experimental animal data to humans (i.e., interspecies differences); (3) uncertainty in extrapolating from data obtained in a study with less-than-lifetime exposure (i.e., extrapolating from sub-chronic to chronic exposure); (4) uncertainty in extrapolating the observed

specific substance when it believes this to be appropriate. In keeping with EPA's goal of protecting public health and the environment, default assumptions are used to ensure that risk to chemicals is not underestimated (although defaults are not intended to overtly overestimate risk). See EPA, 2004, An Examination of EPA Risk Assessment Principles and Practices, EPA/100/B-04/001 available at: <http://www.epa.gov/osa/pdfs/ratf-final.pdf>.

data to obtain an estimate of the exposure associated with no adverse effects; and (5) uncertainty when the database is incomplete or there are problems with the applicability of available studies. Many of the UF used to account for variability and uncertainty in the development of acute reference values are quite similar to those developed for chronic durations, but they more often use individual UF values that may be less than 10. UF are applied based on chemical-specific or health effect-specific information (e.g., simple irritation effects do not vary appreciably between human individuals, hence a value of 3 is typically used), or based on the purpose for the reference value (see the following paragraph). The UF applied in acute reference value derivation include: (1) Heterogeneity among humans; (2) uncertainty in extrapolating from animals to humans; (3) uncertainty in lowest observed adverse effect (exposure) level to no observed adverse effect (exposure) level adjustments; and (4) uncertainty in accounting for an incomplete database on toxic effects of potential concern. Additional adjustments are often applied to account for uncertainty in extrapolation from observations at one exposure duration (e.g., 4 hours) to derive an acute reference value at another exposure duration (e.g., 1 hour).

Not all acute reference values are developed for the same purpose and care must be taken when interpreting the results of

an acute assessment of human health effects relative to the reference value or values being exceeded. Where relevant to the estimated exposures, the lack of short-term dose-response values at different levels of severity should be factored into the risk characterization as potential uncertainties.

Although every effort is made to identify peer-reviewed reference values for cancer and noncancer effects for all pollutants emitted by the sources included in this assessment, some HAP continue to have no reference values for cancer or chronic noncancer or acute effects. Since exposures to these pollutants cannot be included in a quantitative risk estimate, an understatement of risk for these pollutants at environmental exposure levels is possible. For a group of compounds that are either unspecified, or do not have reference values for every individual compound (e.g., glycol ethers), we conservatively use the most protective reference value to estimate risk from individual compounds in the group of compounds.

Additionally, chronic reference values for several of the compounds included in this assessment are currently under the EPA IRIS review and revised assessments may determine that these pollutants are more or less potent than the current value. We may re-evaluate residual risks for the final rulemaking if these reviews are completed prior to our taking final action for these source categories and if dose-response metric changes enough to

indicate that the risk assessment supporting this notice may significantly understate human health risk.

When we identify acute impacts which exceed their relevant benchmarks, we pursue refining our acute screening estimates. For the Mineral Wool Production source category, we used a refined emissions multiplier of 3 to estimate the peak hourly emission rates from the average rates. For a detailed description of how the refined emissions multiplier was developed for the Mineral Wool Production source category see the memo on the Acute Effects Factor for Mineral Wool Manufacturing Operations, which is in the docket for this action. For the Wool Fiberglass Manufacturing source category, data were not available to develop a refined emissions multiplier; therefore, the default emissions multiplier of 10 was used.

e. Uncertainties in the Multi-Pathway and Environmental Effects Assessment.

We generally assume that when exposure levels are not anticipated to adversely affect human health, they also are not anticipated to adversely affect the environment. For each source category, we generally rely on the site-specific levels of PB-HAP emissions to determine whether a full assessment of the multi-pathway and environmental effects is necessary. As

discussed above, we conclude that the potential for these types of impacts is low for these source categories.

f. Uncertainties in the Facility Wide Risk Assessment.

Given that the same general analytical approach and the same models were used to generate facility wide risk results as were used to generate the source category risk results, the same types of uncertainties discussed above for our source category risk assessments apply to the facility wide risk assessments. Because the source category processes are the only processes at each facility, there is no greater uncertainty for facility wide emissions.

B. How did we consider the risk results in making decisions for this proposal?

Based on our risk assessment we are proposing that risks due to hexavalent chromium and formaldehyde are acceptable, with a maximum individual cancer risk for the source category at 40-in-one million. Emissions testing at the facility presenting this risk indicated that 92 percent of the total chromium compounds were hexavalent chromium. In the second step of the process, the EPA sets the standard at a level that provides an ample margin of safety.

We found from our risk assessment that risks due to hexavalent chromium were acceptable at 40-in-one million. In the second step of our risk assessment, we considered whether any

cost-effective measures, technologies or practices are available to reduce risks further to an "ample margin of safety". We found two methods whereby hexavalent chromium emissions can be reduced at wool fiberglass facilities and we are proposing in this action emission limits for hexavalent chromium from wool fiberglass facilities that will provide an ample margin of safety to protect the public health and prevent adverse environmental effects. We discuss these methods further in **Sections V.A., VIII. D and VIII. E** of this preamble.

In past residual risk actions, the EPA has presented and considered a number of human health risk metrics associated with emissions from the category under review, including: the MIR; the numbers of persons in various risk ranges; cancer incidence; the maximum non-cancer HI; and the maximum acute non-cancer hazard (72 FR 25138, May 3, 2007; 71 FR 42724, July 27, 2006). In our most recent proposals (75 FR 65068, October 21, 2010 and 75 FR 80220, December 21, 2010), the EPA also presented and considered additional measures of health information, such as estimates of the risks associated with the maximum level of emissions which might be allowed by the current MACT standards (see, e.g., 75 FR 65068, October 21, 2010 and 75 FR 80220, December 21, 2010). The EPA also discussed and considered risk estimation uncertainties. The EPA is providing this same type of

information in support of the proposed actions described in this Federal Register notice.

The agency is considering all available health information to inform our determinations of risk acceptability and ample margin of safety under CAA section 112(f). The agency acknowledges that the Benzene NESHAP provides flexibility regarding what factors the EPA might consider in making determinations and how these factors might be weighed for each source category. Thus, the level of the MIR is only one factor to be weighed in determining acceptability of risks.

The EPA wishes to point out that certain health information has not been considered to date in making residual risk determinations. In assessing risks to populations in the vicinity of the facilities in each category, we present risk estimates associated with HAP emissions from the source category alone (source category risk estimates) and the risks due to HAP emissions from the entire facility at which the covered source category is located (facility wide risk estimates). We have not attempted to characterize the risks associated with all HAP emissions impacting the populations living near the sources in these categories. That is, at this time, we do not attempt to quantify those HAP risks that may be associated with emissions from other facilities that are not included in the source categories in question, including mobile source emissions,

natural source emissions, persistent environmental pollution, and atmospheric transformation in the vicinity of the sources in these categories.

The agency understands the potential importance of considering an individual's total exposure to HAP in addition to considering exposure to HAP emissions from the source category and facility. This is particularly important when assessing non-cancer risks, where pollutant-specific exposure health reference levels (e.g., RfC) are based on the assumption that thresholds exist for adverse health effects. For example, the agency recognizes that, although exposures attributable to emissions from a source category or facility alone may not indicate the potential for increased risk of adverse non-cancer health effects in a population, the exposures resulting from emissions from the facility in combination with emissions from all of the other sources (e.g., other facilities) to which an individual is exposed may be sufficient to result in increased risk of adverse non-cancer health effects. In May 2010, the EPA SAB advised us "... that RTR assessments will be most useful to decision makers and communities if results are presented in the broader context of aggregate and cumulative risks, including background

concentrations and contributions from other sources in the area."³⁴

Although we are interested in placing source category and facility wide HAP risks in the context of total HAP risks from all sources combined in the vicinity of each source, we are concerned about the uncertainties of doing so. At this point, we believe that such estimates of total HAP risks will have significantly greater associated uncertainties than for the source category or facility wide estimates, and hence would compound the uncertainty in any such comparison. This is because we have not conducted a detailed technical review of HAP emissions data for source categories and facilities that have not previously undergone an RTR review or are not currently undergoing such review.

C. How did we perform the technology review?

For our technology review, we identified and evaluated the developments in practices, processes and control technologies that have occurred since the 1999 MACT rules were promulgated. In cases where we identified such developments, we analyzed the

³⁴ The EPA's responses to this and all other key recommendations of the SAB's advisory on RTR risk assessment methodologies (which is available at: [http://yosemite.epa.gov/sab/sabproduct.nsf/4AB3966E263D943A8525771F00668381/\\$File/EPA-SAB-10-007-unsigned.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/4AB3966E263D943A8525771F00668381/$File/EPA-SAB-10-007-unsigned.pdf)) are outlined in a memo to this rulemaking docket from David Guinnup entitled, EPA's Actions in Response to the Key Recommendations of the SAB Review of RTR Risk Assessment Methodologies.

technical feasibility of and the estimated impacts (costs, emissions reductions, risk reductions, etc.) of applying these developments. We then decided, based on impacts and feasibility, whether it was necessary to propose amendments to the regulation to require any of the identified developments.

Based on our analyses of the data, information collected under the voluntary industry survey, our general understanding of both of the industries and other available information on potential controls for these industries, we identified potential developments in practices, processes, and control technologies.

For the purpose of this exercise, we considered any of the following to be a "development":

- Any add-on control technology or other equipment that was not identified and considered during development of the 1999 MACT rules.
- Any improvements in add-on control technology or other equipment (that were identified and considered during development of the 1999 MACT rules) that could result in significant additional emissions reduction.
- Any work practice or operational procedure that was not identified or considered during development of the 1999 MACT rules.

- Any process change or pollution prevention alternative that could be broadly applied to the industry and that was not identified or considered during development of the 1999 MACT rules.
- Any development in equipment or technology that could result in increased HAP emissions.

In addition to reviewing the practices, processes, and technologies that were not considered at the time we developed the 1999 MACT rules, we reviewed a variety of data sources for the mineral wool and wool fiberglass industries. Among the data sources we reviewed were the NESHAP for various industries that were promulgated after the 1999 MACT rules. We reviewed the regulatory requirements and/or technical analyses associated with these regulatory actions to identify any practices, processes and control technologies considered in these efforts that could possibly be applied to emissions sources in the Mineral Wool Production and Wool Fiberglass source categories, as well as the costs, non-air impacts, and energy implications associated with the use of these technologies. We reviewed scientific and technical literature regarding refractory products including high chrome refractories and consulted experts in the refractory manufacturing field.

Control technologies, classified as RACT, BACT, or LAER apply to stationary sources depending on whether the sources are existing or new, and on the size, age and location of the facility. We consulted the EPA's RBLC to identify potential technology advances. BACT and LAER (and sometimes RACT) are determined on a case-by-case basis, usually by state or local permitting agencies. The EPA established the RBLC to provide a central database of air pollution technology information (including technologies required in source-specific permits) to promote the sharing of information among permitting agencies and to aid in identifying future possible control technology options that might apply broadly to numerous sources within a category or apply only on a source-by-source basis. The RBLC contains over 5,000 air pollution control permit determinations that can help identify appropriate technologies to mitigate many air pollutant emissions streams. We searched this database to determine whether it contained any practices, processes, or control technologies for the types of processes covered by the Mineral Wool Production and Wool Fiberglass Manufacturing MACT rules.

Additionally, we requested information from facilities regarding developments in practices, processes, or control technology. Finally, we reviewed other information sources, such

as State and local permitting agency databases and industry-supported databases.

D. What other issues are we addressing in this proposal?

In addition to the analyses described above, we also reviewed other aspects of the MACT standards for possible revision. Based on this review we have identified several aspects of the MACT standards that we believe need revision. This includes proposing revisions to the startup, shutdown, and malfunction provisions of the MACT rule in order to ensure that they are consistent with a recent court decision in Sierra Club v. EPA, 551 F. 3d 1019 (D.C. Cir. 2008).

We are proposing HAP-specific emission limits for COS, phenol, and methanol in place of surrogacy in the MACT standards. The proposed rule also would regulate the collection process as a source of HAP emissions of phenol, methanol and formaldehyde that were not included in the 1999 Mineral Wool MACT standard.

In addition, we are proposing other various minor changes with regards to editorial errors and other revisions to promote the use of plain language. The analyses and proposed decisions for these actions are presented in **Section VI** of this preamble.

E. What analyses were performed for the Mineral Wool Production Source Category under the Regulatory Flexibility Act?

Section 609(b) of the RFA requires a Panel to be convened prior to publication of the IRFA that an agency may be required to prepare under the RFA. The RFA directs the Panel to report on the comments of small entity representatives and make findings on the following elements:

- a description and estimate of the number of small entities to which the proposed rule will apply;
- a description of projected reporting, recordkeeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirements and the type of professional skills necessary for preparation of the report or record;
- an identification, to the extent practicable, of all relevant federal rules which may duplicate, overlap, or conflict with the proposed rule; and
- descriptions of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities. This analysis must discuss any significant alternatives such as:

- the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;
- the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;
- the use of performance rather than design standards; and
- an exemption from coverage of the rule, or any part thereof, for such small entities.

Once completed, the Panel Report presents the results of the analyses identified in the above list, and is provided to the agency issuing the proposed rule and is included in the rulemaking record. The agency is to consider the Panel's findings when completing the draft of the proposed rule. In light of the Panel Report, and where appropriate, the agency is also to consider whether changes are needed to the IRFA for the proposed rule or the decision on whether an IRFA is required.

The Panel's findings and discussion are based on the information available at the time the final Panel Report is published. The EPA will continue to conduct analyses relevant to the proposed rule, and additional information may be developed or obtained during the remainder of the rule development process.

Any options identified by the Panel for reducing the rule's regulatory impact on small entities may require further analysis and/or data collection to ensure that the options are practicable, enforceable, environmentally sound and consistent with the CAA and its amendments. The Mineral Wool SBAR Panel convened on June 2, 2011, to address regulatory flexibility alternatives and opportunities for the mineral wool industry.

VI. Summary of Proposed Decisions and Actions

Pursuant to CAA sections 112(d)(2), 112(d)(6) and 112(f), we are proposing to revise the 1999 MACT rules relative to mineral wool production and wool fiberglass manufacturing to include the standards and requirements summarized in this section. More details of the rationale for these proposed standards and requirements are provided in **Sections VII and VIII** of this preamble. In addition, as part of these rationale discussions, we solicit public comment and data relevant to several issues. The comments we receive during the public comment period will help inform the rule development process as we work toward promulgating a final action.

A. What are the proposed decisions and actions related to the Mineral Wool Production NESHAP?

The following sections discuss the proposed decisions and actions regarding unregulated pollutants and emissions sources (i.e., the MACT floors), recordkeeping and notification,

compliance and other proposed decisions and actions related to subcategorization of emissions sources and the findings of the SBAR Panel.

1. Addressing Unregulated Pollutants and Emissions Sources from Mineral Wool Production.

In the course of evaluating the 1999 MACT rule, we identified certain HAP for which we failed to establish emission standards in the original MACT (i.e., COS, HF, HCl, phenol, and methanol) and certain unregulated processes (i.e., collection). Some of these HAP (COS, phenol, and methanol) were not regulated under the 1999 MACT rule because they were represented by surrogates (i.e., CO and formaldehyde). The EPA did not regulate HF and HCl in the 1999 rule although these HAP are emitted from cupolas. The 1999 MACT rule also did not regulate any HAP emitted from collection processes that occur on a bonded line even though these processes emit the HAP phenol, formaldehyde, and methanol. According to National Lime v. EPA, 233 F. 3d 625, 634 (D.C. Cir. 2000), the EPA has a "clear statutory obligation to set emissions standards for each listed HAP". As a part of the information collected in 2010 to support this proposal, we specifically evaluated COS, HF, and HCl from cupolas and formaldehyde, phenol and methanol from collection and curing operations.

For the Mineral Wool Production source category, we are proposing MACT limits for: (1) COS, HF and HCl for existing, new and reconstructed cupolas; and (2) formaldehyde, phenol and methanol for existing, new and reconstructed combined collection and curing operations. The collection process emits HAP when a phenol-formaldehyde based binder is sprayed during collection. Such collection processes immediately precede curing ovens. Both processes emit HAP when they occur on bonded production lines, but of the two processes, only the curing oven was regulated under the 1999 MACT standard. This proposed rule regulates collection and curing as a combined process on bonded production lines under three subcategories (one subcategory for each combined process design). The proposed emissions limits were calculated using the 99 percent UPL method.

We considered beyond-the-floor options for COS, HF, and HCl standards for all cupolas, and for formaldehyde, phenol and methanol for all combined collection and curing operation designs, as required by section 112(d)(2) of the Act. However, we decided not to propose any limits based on the beyond-the-floor analyses for COS, HF, HCl, formaldehyde, phenol, and methanol for these sources because of the costs, potential disadvantages of additional controls (including the cost of RTO and unintended SO₂ emissions), non-air environmental impacts, and adverse energy implications associated with use of these

additional controls. The beyond-the-floor analyses are presented in the technical documentation for this action (see MACT Floor Analysis for the Mineral Wool Production Manufacturing Source Category and the MACT Floor Analysis for the Wool Fiberglass Manufacturing Source Category), and are available in the docket for this action.

In summary, we are proposing the following emissions limits for existing, new, and reconstructed cupolas in the Mineral Wool Production Source Category as presented in Table 2. We are not proposing changes to the PM emissions limits in the 1999 MACT rule for Mineral Wool Production, and for this reason they are not included in the proposed limits in Table 2 below.

Table 2. Mineral Wool Production Proposed Emissions limits for Existing, New, and Reconstructed Cupolas, pound of pollutant per ton of melt

Pollutant	Emission Limit (lb/ton of melt)	
	Existing Cupolas	New and Reconstructed Cupolas
COS	3.3	0.017
HF	0.014	0.014
HCl	0.0096	0.0096

2. Subcategorization.

Under CAA section 112(d)(1), the EPA has the discretion to "...distinguish among classes, types, and sizes of sources within a category or subcategory in establishing..." standards. When separate subcategories are established, a MACT floor is determined separately for each subcategory. To determine whether

the mineral wool production facilities warrant subcategorization for the MACT floor analysis, the EPA reviewed unit and process designs, operating information, and air emissions data compiled in the industry survey data set and other information collected by the agency for development of the NESHAP for this source category. Based on this review, the EPA concluded that there are significant design and operational differences in the collection operations at each of the three facilities that operate a bonded line in this source category.

For the unregulated process that emits HAP (i.e., collection and curing for facilities that operate a bonded line), we are proposing to subcategorize combined collection operations and curing ovens designs into three subcategories based on what the industry is currently using: vertical, horizontal and drum. When separate subcategories are established, a MACT standard is determined separately for each subcategory. To determine whether the mineral wool production facilities warrant subcategorization for the MACT floor analysis, the EPA reviewed unit and process designs, operating information and air emissions data compiled in the industry survey data set and other information collected by the agency for development of the NESHAP for this source category. Based on this review, the EPA concluded that there are significant design and operational differences in the collection operations at each

of the three facilities that operate a bonded line in this source category. The combined collection and curing designs consist of three design types: vertical, horizontal and drum. For each existing, new, and reconstructed combined collection and curing operation, we are proposing the following emissions limits as presented in Table 3.

Table 3. Mineral Wool Production Proposed Emissions limits for Existing, New, and Reconstructed Combined Collection and Curing Operations, pound of pollutant per ton of melt

Design	Pollutant	Emission Limit (lb/ton of melt)
Vertical	Formaldehyde	0.46
	Phenol	0.52
	Methanol	0.63
Horizontal	Formaldehyde	0.054
	Phenol	0.15
	Methanol	0.022
Drum	Formaldehyde	0.067
	Phenol	0.0023
	Methanol	0.00077

3. Reporting and Recordkeeping Notifications.

We are proposing to revise certain reporting and recordkeeping requirements of 40 CFR part 63, subpart DDD. Specifically, we are proposing that facilities maintain records and prepare and submit performance test reports on the frequency described below in Compliance Dates and Approaches to comply with the proposed emissions limits for COS, HF, HCl, formaldehyde, phenol, methanol and the existing PM limit. Although the PM limits in the existing MACT do not change as a result of this proposed rule we are proposing the same

reporting, recordkeeping requirements for PM as for the other pollutants addressed under this proposed rule. We are also proposing language that would require the use of electronic reporting for all test methods that are supported by the ERT. Methods supported by ERT may be found at <http://www.epa.gov/ttn/chief/ert/index.html>.

4. Compliance Dates and Approaches.

We are proposing that facilities that commenced construction or reconstruction on or before [INSERT DATE OF PUBLICATION OF THIS PROPOSED RULE IN THE FEDERAL REGISTER] must demonstrate compliance with the requirements of this subpart no later than 3 years after the effective date of this rule. Affected sources that commenced construction or reconstruction after the effective date of this rule must demonstrate compliance with the requirements of this subpart no later than the effective date of the rule or upon start-up, whichever is later.

We are proposing that compliance testing for PM, COS, formaldehyde, phenol and methanol be conducted using the same test methods as required by the 1999 MACT rule (i.e., Method 5 for PM and Method 318 for the organic HAP). We are proposing that sources can use either Test Method 26A or Test Method 320 to determine compliance for HF and HCl.

We are proposing both an initial performance test and repeat testing every 5 years or more often if the raw materials charged to the cupola change by more than 10 percent of that used for the initial performance test. Finally, we propose that continuous monitoring of appropriate operating parameters for control devices (e.g., RTO), cupolas, curing ovens and/or collection operations will be required as parametric monitoring. This is to ensure continuous compliance with the PM, COS, HF, HCl, formaldehyde, phenol and methanol emissions limits.

5. Other Decisions and Actions.

In addition to the proposed decisions and actions discussed above, we are also proposing changes to the use of surrogates in the existing rule and to subcategorize the combined collection operations and curing oven designs from those facilities operating bonded lines. We also discuss here the findings of the SBAR panel.

a. Surrogacy.

As described in **Sections III.B and VII.B** of this preamble, the court, in the Brick MACT decision (*Sierra Club v. EPA*, 479 F. 3d 875 (D.C. Cir. March 13, 2007))³, found that the EPA has a "clear statutory obligation to set emission standards for each listed HAP," which does not allow it to "avoid setting standards for HAP not controlled with technology." Because we did not conduct analyses that would support the use of CO as a surrogate

for COS, or formaldehyde for methanol and phenol, we cannot demonstrate that we established emission limits for COS, methanol and phenol in the 1999 MACT standard. Therefore, the agency is proposing to add emission limits for both phenol and methanol. Similarly, the agency is proposing to discontinue the use of CO as a surrogate for COS, and to set emission limits for COS. The proposed emissions limits for formaldehyde, phenol, methanol and COS are presented in Tables 2 and 3, above. We are soliciting comment on our decisions to discontinue use of formaldehyde and CO as surrogates; any person wishing to establish or reestablish surrogacy relationships of one pollutant for others should provide emissions testing to support their conclusions.

b. Small Business Advocacy Review Panel.

For purposes of assessing the impacts of the proposed rule on small entities, the RFA defines small entities as including "small businesses," "small governments," and "small organizations" (5 USC 601). The regulatory revisions being considered by the EPA for this rulemaking are expected to affect a variety of small businesses, but would not affect any small governments or small organizations. The RFA references the definition of "small business" found in the Small Business Act, which authorizes the SBA to further define "small business" by regulation. The SBA definitions of small business by size

standards using the NAICS can be found at 13 CFR 121.201. For the Mineral Wool Production source category (NAICS code 327993), the SBA size standard for a small business is 500 employees. Based on this size designation, there are currently 5 small businesses operating with a total number of 540 employees.

Under section 609(b) of the RFA, the Panel is to report its findings related to these four items:

- A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply;
- A description of the projected reporting, recordkeeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
- Identification, to the extent practicable, of all relevant federal rules which may duplicate, overlap or conflict with the proposed rule; and
- A description of any significant alternatives to the planned proposed rule which would minimize any significant economic impact of the proposed rule on small entities consistent with the stated objectives of the authorizing statute.

The Panel's most significant findings and discussion with respect to each of these items are summarized below. To read the full discussion of the Panel findings and recommendations, see Section 9 of the Panel Report.

1. Number and Types of Entities Affected

Six companies exist in this industry; five of the six companies are small businesses. All small businesses in the mineral wool production industry operate under NAICS code 327993.

2. Recordkeeping, Reporting and Other Compliance Requirements

The proposed rule under consideration potentially impacts small businesses by requiring new emission limits on processes that were not regulated under the MACT standard promulgated in 1999, by requiring emission limits for pollutants that were not regulated under the MACT, or both processes and pollutants not regulated under the MACT. All companies are subject to Title V operating permits requirements, and as such will be required to add the newly regulated processes to their operating permits along with compliance demonstrations that the processes meet each pollutant emission limit in the rule. Compliance testing will be required to be conducted using EPA methods for each pollutant. Reporting and recordkeeping requirements are not expected to change from the MACT, with the exception of additional pollutants and processes included in such reports.

3. Related Federal Rules

NAAQS: the most prevalent technology for reducing COS emissions will increase emissions of SO₂. Under the current NAAQS, none of the small entities are in nonattainment areas, so installation of emissions control equipment should not subject them to additional permitting requirements under the SO₂ NAAQS. However, the EPA cannot make such assurances about future NAAQS or future nonattainment zones, so there is a risk that future compliance with this rule could trigger additional emissions control requirements through the Title V/prevention of significant deterioration permit program.

GHG: Most emissions control strategies identified by the EPA during the Panel would increase the energy intensity of mineral wool production. Although the Panel does not have specific information about the GHG emissions of individual facilities in this industry, these facilities could be subject to GHG permitting as that program is phased in under the Tailoring Rule.

4. Regulatory Flexibility Alternatives

The Panel agrees that the EPA does not have discretion in a number of areas that SER commented upon. Specifically, the EPA does not have the discretion to set the MACT floor emission limits at levels suggested by the SER. The Panel recognizes that EPA has the authority to review the MACT standard for

completeness, risk, and technology improvements, and that the agency is currently under court order to conduct the risk and technology review for the mineral wool source category and propose amendments to the standard by October 31, 2011, and promulgate the amendments by October 31, 2012. However, whenever opportunities for regulatory flexibility arise, and when that regulatory flexibility can work to lessen impacts to small businesses, the Panel recommends that the EPA propose amendments to the mineral wool MACT that offer such regulatory flexibility to the maximum extent possible. Specifically, these opportunities arise in the following situations:

- Selection of the averaging method in calculating the MACT floor for COS from cupolas and phenol, formaldehyde and methanol emissions from collection and curing processes; and
- Subcategorization of regulated processes, when appropriate.

The Panel recommends that the EPA not require BTF emission limits for the mineral wool industry. Such limits are likely to have additional cost impacts to industry. In addition, the EPA did not identify BTF measures for consideration and has found that the results of the risk assessment show acceptable risks from this source category.

The Panel recommends subcategorization of collection along the lines described in Section 3 of the Panel Report, specifically, subcategorization for vertical collection and curing, horizontal collection and curing, and drum collection and curing. Based on available information, the Panel believes that emission standards based on the average emission limits across both collection and curing processes at each of the three subcategories would minimize the burden on small entities while fully complying with the EPA's obligations under section 112. The Panel also recommends setting MACT limits for new sources equal to MACT limits for existing sources.

The Panel recommends that the EPA allow the maximum amount of time within its discretion (3 years) and work with state permitting authorities to provide for the additional year permitted by the statute.

The Panel recommends that the EPA provide a detailed discussion in the preamble to the proposed rule that outlines the manner in which small entities may demonstrate compliance with the rule, when finalized, during start-up and shutdown. The Panel also recommends that the EPA propose allowing an affirmative defense against compliance actions for malfunction events, consistent with other section 112 rules recently promulgated. For more information on the SBAR Panel review process and findings, see **Section IV.E** of this preamble and the

Final Report of the Small Business Advocacy Review Panel on the EPA's Planned Proposed Rule Risk and Technology Review (RTR) Amendments to the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Mineral Wool Production October 2011 in the docket.

c. Technical corrections to the rule.

We are also proposing revisions to certain terms in the existing NESHAP. Specifically, we are proposing to replace the term "incinerator" with "regenerative thermal oxidizer" to avoid confusion with rules promulgated under CAA section 129 and any new requirement that may be imposed on something called an "incinerator". We are also proposing to specify performance testing frequency for RTOs.

B. What are the proposed decisions and actions related to the Wool Fiberglass Manufacturing NESHAP?

The following sections discuss the decisions proposed by this action with regard to the following topics: unregulated pollutants and emissions sources; the risk review; the technology review; our plans regarding area sources; recordkeeping, reporting and notification requirements; compliance requirements; and other proposed decisions and actions (i.e., changes in surrogacy and terminology cleanup).

1. Addressing Unregulated Pollutants and Emissions Sources.

In the course of evaluating the 1999 MACT rule, we identified certain HAP for which we failed to establish emission standards in the original MACT (i.e., HF, HCl, phenol and methanol). As stated earlier, the EPA has "clear statutory obligation to set emissions standards for each listed HAP". National Lime v. EPA, 233 F. 3d 625, 634 (D.C. Cir. 2000). The EPA specifically evaluated HF and HCl, from glass-melting furnaces and formaldehyde, phenol and methanol from RS manufacturing lines and FA manufacturing lines.

a. Surrogacy.

As described in **Sections III. B and VII.B** of this preamble, the Court, in the Brick MACT decision, also found that the EPA erred when we did not establish emission limits for each HAP emitted from industrial processes regulated by the MACT standard. We are proposing to replace CO as a surrogate for COS with COS emissions limits. We are also proposing to discontinue use of formaldehyde as a surrogate for phenol and methanol. We are, therefore, proposing to add emission limits for COS, phenol and methanol. The proposed emissions limits can be found in Tables 4-6, below.

Table 4. Proposed Emissions limits for Rotary Spin (RS) Manufacturing Lines (pound of pollutant/ton of melt)

Pollutant	Existing RS Lines	New and Reconstructed RS Lines
Formaldehyde	0.17	0.020
Phenol	0.19	0.0011
Methanol	0.48	0.00067

Table 5. Proposed Emissions limits for Flame Attenuation (FA) Manufacturing Lines (pound of pollutant/ton of melt)

Pollutant	Existing FA Lines	New and Reconstructed FA Lines
Formaldehyde	5.6	3.3
Phenol	1.4	0.46
Methanol	0.50	0.50

Table 6. Proposed Emissions limits for Glass-Melting Furnaces (pound of pollutant/ton of melt)

Pollutant	Existing Furnaces	New and Reconstructed Furnaces
HF	0.002	0.00078
HCl	0.0015	0.00078

b. Emission Limits for Unregulated HAPs.

For the Wool Fiberglass Manufacturing source category, we are proposing MACT limits for HF and HCl for glass-melting furnaces; formaldehyde, phenol and methanol from existing, new, and reconstructed RS manufacturing lines; and formaldehyde, phenol and methanol from existing, new, and reconstructed FA manufacturing lines. The proposed emissions limits can be found in Tables 4-6 above.

Section 112(d)(3)(B) of the CAA requires that the MACT standards for existing sources be at least as stringent as the average emissions limitation achieved by the best performing 12 percent of sources (for which the Administrator has or could reasonably obtain emissions information) in a category with more than 30 sources. The Wool Fiberglass Manufacturing source

category consists of 29 facilities with approximately 80 glass-melting furnaces. Since there are more than 30 furnaces, we based the MACT floor limit on the average emissions limitation achieved by the best performing 12 percent of furnaces.

The EPA must exercise its judgment, based on an evaluation of the relevant factors and available data, to determine the level of emissions control that has been achieved by the best performing sources under variable conditions. It is recognized in the case law that the EPA may consider variability in estimating the degree of emissions reduction achieved by best-performing sources and in setting MACT floors. See Mossville Env't'l Action Now v. EPA, 370 F.3d 1232, 1241-42 (D.C. Cir 2004) (holding that the EPA may consider emissions variability in estimating performance achieved by best-performing sources and may set the floor at a level that a best-performing source can expect to meet "every day and under all operating conditions"). More details on how we calculate MACT floors and how we account for variability are described in the MACT Floor Analysis for the Wool Fiberglass Manufacturing Source Category which is available in the docket for this proposed action.

We considered beyond-the-floor options for the HF and HCl standards for all of the glass-melting furnaces and the formaldehyde, phenol and methanol standards for all RS manufacturing lines and FA manufacturing lines, as required by

section 112(d)(2) of the Act. We decided not to propose any limits based on the beyond-the-floor analyses for any of these pollutants because of the costs, non-air environmental impacts, and adverse energy implications associated with use of these additional controls. The beyond-the-floor analysis is presented in the technical documentation for this action (MACT Floor Analysis for the Mineral Wool Production Source Category and the MACT Floor Analysis for the Wool Fiberglass Manufacturing Source Category).

2. Proposed decisions based on the Risk Review.

Based on the results of our risk assessment and risk review (which are described in more detail in **Section VIII** of this preamble), we are proposing emission limits for chromium compounds under the authority of section 112(f)(2) of the CAA of 0.006 pounds of total chromium per thousand tons of glass pulled. As explained in **Section VIII** of this preamble, we are proposing these limits as an outcome of our ample margin of safety analysis.

3. Proposed decisions based on the Technology Review for the Wool Fiberglass Industry.

As explained in **Sections VI.B and VIII.E** of this preamble, we are proposing emissions limits for PM, under section 112(d)(6) (see Table 12 of **Section VIII** in this preamble). Furthermore, as explained in **Section VIII.F** of this preamble, we

are proposing emissions limits for chromium compounds under section 112(d)(6) of the CAA as part of our technology review (see those sections for details) of 0.006 pounds of total chromium per thousand tons of glass pulled, which is the same limit we are proposing under Section 112(f)(2) of the CAA.

In our technology review for this industry, we discovered and evaluated two new technology developments that affect emissions from wool fiberglass manufacturing furnaces: furnace control technologies and high chrome refractories. These are discussed below.

Wool fiberglass furnaces are now equipped with air pollution control devices that achieve emissions of about 0.014 pounds PM per ton of glass produced. This is about 50 times lower than required under the MACT rule (0.5 lb PM per ton glass produced). In light of the record and additional data we received on PM emissions, we are proposing revised PM limits under the technology review of the wool fiberglass source category (as described in **Section VIII** of this preamble).

Glass-melting furnaces are constructed using refractories, which direct the heat of the furnace back into the melt. We are aware of a new technology that is used to significantly extend the life of the wool fiberglass furnace: refractories that are made of almost 100 percent chromium compounds and that are used to construct entire furnaces or very large parts of furnaces.

Based on emission testing of one furnace, it appears that the levels of chromium compounds that can be emitted when glass-melting furnaces are constructed from high chrome refractories can be significant. This facility operates two furnaces. The total chromium compound emissions at this facility are estimated as 913 lb/yr assuming that both furnaces emit at a similar rate. This includes 840 pounds of hexavalent chromium. Industry information indicates that the furnaces emitting the highest levels of chromium compounds are constructed in whole or in part from these types of refractories. (Notes of April 14, 2011; Region 7 Certainteed Notes).^{12,13}

It is our understanding that because of the corrosive properties of the molten glass, fresh refractory is continuously exposed to the molten glass along the metal/glass contact line in the glass-melting furnace process. This increases the surface area of the refractory that is exposed to the molten glass. As a result, when the glass furnace is constructed using high chrome refractories, the emission levels of chromium compounds continuously increase over the life of the furnace (Please refer to notes of April 14, 2011, telephone discussion between Susan Fairchild and Certainteed). One industry spokesperson estimated that 20,000 lb/yr of refractory are worn away from the inside

walls of one wool fiberglass furnace and ducted to the control device before venting to the atmosphere.³⁵

On August 31, 2011, industry representatives met with the agency to provide data, in an attempt to improve our understanding of the levels of chromium content in refractory products used at wool fiberglass furnaces and their impacts on chromium complund emissions. In the meeting industry representatives stated the following:

- the use of chromium in refractories is important to wool fiberglass operations because it extends the useful life of the furnace;
- chromium content of furnaces vary from 0 to 95 percent; there is no distinction between the types of refractories used at the highest chrome emitting furnace and the refractories used to construct other glass furnaces that emit low levels of hexavalent chromium.
- the type of furnace used at the high chromium emitting facility may may be responsible for increased hexavalent chromium emissions

However, the information from the meeting appears to contradict other information on the reason for certain furnaces to have elevated chromium emissions. As previously discussed,

³⁵ Meeting between U.S. EPA, wool fiberglass industry representatives and NAIMA (trade association). August 31, 2011. At USEPA offices in Research Triangle Park, NC.

emission test results from the 2010 testing and previous statements made to the EPA from owners/operators (Notes of April 14, 2011, Certaineed; Region 7 Certaineed notes) seem to imply that the high chromium emissions are due to the chromium content of the refractory. Because of this contradictory information we are requesting additional emissions testing of wool fiberglass furnaces (discussed below). We are also soliciting comment on whether and how to subcategorize industry according to furnace type, or type of refractory. Commenters should also provide emissions test data to support their assertions regarding the correct manner in which to subcategorize the industry.

As shown in Table 12 of **Section VIII** of this preamble, we are proposing chromium compound emissions limits of 0.00006 lb/ton of glass produced. These limits would apply to wool fiberglass furnaces at major sources. However, there are no differences in furnaces at major sources and those at area sources. We are concerned about the levels of hexavalent chromium that can be emitted by area sources where furnaces may be constructed or reconstructed using high chrome refractories. We are announcing today our plans to regulate wool fiberglass area sources in a future action. We have issued a section 114 information collection request to the wool fiberglass industry to collect comprehensive information specific to the chrome content of the refractories used to construct their glass-

melting furnaces and obtain complete chromium emissions test data. This information will enable us determine the scope of the source category (in terms of the universe of wool fiberglass producers that are area sources and that emit hexavalent chromium) to be regulated in the future action.

We are requesting information specific to wool fiberglass furnaces, including information on the chromium content of the refractories used in furnace construction, process rates and emissions testing. Nevertheless, we are soliciting comment from the public on our approach to limit emissions of chromium compounds as well as other alternatives to reducing emissions of chromium compounds, especially hexavalent chromium.

4. Reporting, Recordkeeping and Notification Requirements

We are proposing to revise certain recordkeeping requirements of 40 CFR part 63, subpart NNN. Specifically, we are proposing that facilities maintain records and prepare and submit performance test reports to comply with the proposed emissions limits for PM, chromium compounds, HF, HCl, formaldehyde, phenol and methanol. Because refractory products can contain chromium compounds that can then be emitted to the ambient air during wool fiberglass manufacturing, we are proposing that owners/operators of glass manufacturing furnaces maintain records of the refractory brick composition from which the furnaces are constructed, including any rebricking or

additional layers of refractory that are added to the outside furnace walls. In addition, owners and operators are required to keep records of the occurrence and duration of each malfunction or operation of the air pollution control equipment and monitoring equipment. We are also proposing requirements for the use of electronic reporting for all test methods that are supported by the ERT. Methods supported by ERT may be found at <http://www.epa.gov/ttn/chief/ert/index.html>.

5. Compliance Dates and Approaches.

With regard to formaldehyde, HCL, HF, phenol and methanol, we are proposing that facilities that commenced construction or reconstruction on or before [INSERT DATE OF PUBLICATION OF THIS PROPOSED RULE IN THE FEDERAL REGISTER] must demonstrate compliance with the requirements of this subpart no later than 3 years after the effective date of this rule. Affected sources that commenced construction or reconstruction after the proposal date of this rule must demonstrate compliance with the requirements of this subpart no later than the effective date of the rule or upon start-up, whichever is later. We are proposing an initial performance test within 90 days of promulgation of the final rule.

With regard to total chromium compounds, we are proposing that the requirements under CAA section 112(f)(2), if finalized, must be implemented no later than 90 days after the effective

date of this rule, but the EPA may extend that timeframe for circumstances under which we believe the additional time is necessary for installation of air pollution control equipment or other measures to reduce HAP emissions. We are, therefore, allowing affected sources up to one year from the effective date of this rule to demonstrate compliance with the chromium emission limits. Consistent with CAA section 112(f)(4)(B), we are proposing that a one-year compliance period is necessary so that affected facilities have adequate time to install additional controls and demonstrate compliance, including the time necessary to purchase, install and test control equipment. Because these limits reflect the reductions from glass making furnaces required under both sections 112(d)(6) and 112(f)(2), we believe a one-year compliance timeframe is needed for the same reasons provided above. In addition, we are proposing that the PM emissions limit that would reflect reductions required for the glass making furnaces pursuant to CAA section 112(d)(6) must be met no later than one year after the effective date of this rule. We believe this time is needed to either enable installation of replacement bags, or if a facility decides to add a new baghouse in series with an existing baghouse, seek bids, select a vendor, install and test the new equipment; prepare and submit the reports in this proposed rule, if finalized.

Therefore, we are proposing that wool fiberglass facilities would be required to show compliance with both PM and the chromium limits within 1 year of promulgation of this standard. We are soliciting comments on this aspect of this proposed action.

Additionally, we propose that compliance with the proposed chromium compounds emissions limits be demonstrated by annual performance tests for all glass-melting furnaces subject to this rule as described in **Section VI.B.2** of this preamble. We are proposing additional annual performance testing no later than 12 calendar months following the initial or previous performance or compliance test to demonstrate compliance with the chromium compounds emissions limit for furnaces.

We are proposing both an initial performance test and repeat testing every 5 years on the RS and FA lines and each time the binder formulation changes by more than 10 percent as compared to the binder formulation used in the initial performance test. We are seeking comment on whether the binder formulation variability of 10 percent as used here is appropriate.

We are proposing that compliance testing for PM, formaldehyde, phenol and methanol be conducted using the same test methods as required by the 1999 MACT rule (i.e., Method 5 for PM and Method 318 for formaldehyde, phenol and methanol). We

are proposing Test Method 26A be used to determine compliance for HF and HCl and Test Method 0061 be used to ensure compliance with the chromium compounds emission limit.

We propose that continuous monitoring of temperatures of control devices (e.g., fabric filters, wet and dry ESP, scrubbers) for glass-melting furnaces, RS manufacturing lines, and FA manufacturing lines will be required as parametric monitoring to ensure continuous compliance with the PM, chromium compounds, HF, HCl, formaldehyde, phenol and methanol emissions limits.

Because the recent test data for glass-melting furnaces show a significant portion of the chromium compounds are hexavalent chromium, we are requiring Test Method 0061 be used to ensure compliance with the chromium compounds emission limit and as the most cost effective method to determine both total chromium and hexavalent chromium from wool fiberglass furnace stacks. Sources must report both total chromium and hexavalent chromium using this method or all chromium emissions are assumed to be hexavalent chromium.

6. Other Decisions and Actions.

In addition to the proposed decisions and actions discussed above, we are also proposing surrogacy changes and some general cleanup in terminology to the existing rule.

a. Surrogacy.

As described in **Sections III.B and VIII.B** in this preamble, the Court found that the EPA has a "clear statutory obligation to set emission standards for each listed HAP." Because we did not conduct analyses that would support the use of formaldehyde as a surrogate for methanol and phenol, we cannot currently demonstrate that we established emission limits for the HAP methanol and phenol in the 1999 MACT standard. Therefore, we are proposing the emissions limits for phenol and methanol, which are presented in Tables 4-6, above.

b. Technical corrections to the rule.

We are also proposing revisions to certain terms in the existing NESHAP. Specifically, we are proposing to replace the term "incinerator" with "RTO" and specify performance test frequency.

C. What are the proposed decisions and actions related to startup, shutdown and malfunction?

The United States Court of Appeals for the District of Columbia Circuit vacated portions of two provisions in the EPA's CAA section 112 regulations governing the emissions of HAP during periods of SSM. Sierra Club v. EPA, 551 F.3d 1019 (D.C. Cir. 2008), cert. denied, 130 S. Ct. 1735 (U.S. 2010). Specifically, the Court vacated the SSM exemption contained in 40 CFR 63.6(f)(1) and 40 CFR 63.6(h)(1), that are part of a regulation, commonly referred to as the "General Provisions

Rule," that the EPA promulgated under CAA section 112. When incorporated into CAA section 112(d) regulations for specific source categories, these two provisions exempt sources from the requirement to comply with the otherwise applicable CAA section 112(d) emissions standard during periods of SSM.

We are proposing the elimination of the SSM exemption in this rule. Consistent with Sierra Club v. EPA, the EPA is proposing standards in this rule that apply at all times. We are also proposing several revisions to Table 1 to subparts DDD and NNN of part 63 (the General Provisions Applicability table). For example, we are proposing to eliminate the incorporation of the General Provisions' requirement that the source develop an SSM plan. We also are proposing to eliminate or revise certain recordkeeping and reporting that related to the SSM exemption. The EPA has attempted to ensure that we have not included in the proposed regulatory language any provisions that are inappropriate, unnecessary, or redundant in the absence of the SSM exemption. We are specifically seeking comment on whether there are any such provisions that we have inadvertently incorporated or overlooked.

In proposing the standards in this rule, the EPA has taken into account startup and shutdown periods and, for the reasons explained below, is proposing emissions limits for those periods. Information on periods of startup and shutdown received

from the industry survey indicate that emissions during these periods are less than emissions during production. Control devices such as baghouses for PM and metal HAP particulate control and RTO for COS control are started up before the process units, and are operational during the shutdown phase of a process. Therefore, no increase in emissions is expected during these periods. Because the processes are ducted to the control device before startup and after shutdown, and because emissions during startup and shutdown are not more than emissions during production, startup and shutdown emissions limits should be equivalent to the emissions limits for production. Production based emissions limits are expressed in this rule on a pound of pollutant per ton melt basis. However, during startup and shutdown, there is no melt being produced. Therefore, separate standards for periods of startup and shutdown were developed by translating the production-based emissions limits from a pound per ton basis to a pound of pollutant per hour basis and are being proposed in this rule. Periods of startup, normal operations and shutdown are all predictable and routine aspects of a source's operations. However, by contrast, malfunction is defined as a "sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment or a process to operate in a normal or usual manner * * *" (40 CFR

63.2). The EPA has determined that CAA section 112 does not require that emissions that occur during periods of malfunction be factored into development of CAA section 112 standards. Under CAA section 112, emissions standards for new sources must be no less stringent than the level "achieved" by the best controlled similar source and for existing sources generally must be no less stringent than the average emissions limitation "achieved" by the best performing 12 percent of sources in the category. There is nothing in CAA section 112 that directs the agency to consider malfunctions in determining the level "achieved" by the best performing or best controlled sources when setting emissions standards. Moreover, while the EPA accounts for variability in setting emissions standards consistent with the CAA section 112 case law, nothing in that case law requires the agency to consider malfunctions as part of that analysis. Section 112 of the CAA uses the concept of "best controlled" and "best performing" unit in defining the level of stringency that CAA section 112 performance standards must meet. Applying the concept of "best controlled" or "best performing" to a unit that is malfunctioning presents significant difficulties, as malfunctions are sudden and unexpected events.

Further, accounting for malfunctions would be difficult, if not impossible, given the myriad different types of malfunctions that can occur across all sources in the category and given the

difficulties associated with predicting or accounting for the frequency, degree and duration of various malfunctions that might occur. As such, the performance of units that are malfunctioning is not "reasonably" foreseeable. See, e.g., Sierra Club v. EPA, 167 F. 3d 658, 662 (D.C.Cir. 1999) (the EPA typically has wide latitude in determining the extent of data-gathering necessary to solve a problem. The court generally defers to the agency's decision to proceed on the basis of imperfect scientific information, rather than to "invest the resources to conduct the perfect study."). See also, Weyerhaeuser v. Costle, 590 F.2d 1011, 1058 (D.C. Cir. 1978) ("In the nature of things, no general limit, individual permit or even any upset provision can anticipate all upset situations. After a certain point, the transgression of regulatory limits caused by 'uncontrollable acts of third parties,' such as strikes, sabotage, operator intoxication or insanity, and a variety of other eventualities, must be a matter for the administrative exercise of case-by-case enforcement discretion, not for specification in advance by regulation"). In addition, the goal of a best controlled or best performing source is to operate in such a way as to avoid malfunctions of the source and accounting for malfunctions could lead to standards that are significantly less stringent than levels that are achieved by a well-performing non-malfunctioning source. The EPA's approach to

malfunctions is consistent with CAA section 112 and is a reasonable interpretation of the statute.

In the event that a source fails to comply with the applicable CAA section 112(d) standards as a result of a malfunction event, the EPA would determine an appropriate response based on, among other things, the good faith efforts of the source to minimize emissions during malfunction periods, including preventative and corrective actions, as well as root cause analyses to ascertain and rectify excess emissions. The EPA would also consider whether the source's failure to comply with the CAA section 112(d) standard was, in fact, "sudden, infrequent, not reasonably preventable" and was not instead "caused in part by poor maintenance or careless operation" 40 CFR 63.2 (definition of malfunction).

Finally, the EPA recognizes that even equipment that is properly designed and maintained can sometimes fail and that such failure can sometimes cause an exceedance of the relevant emissions standard (see, e.g., State Implementation Plans: Policy Regarding Excessive Emissions During Malfunctions, Startup, and Shutdown (Sept. 20, 1999); Policy on Excess Emissions During Startup, Shutdown, Maintenance and Malfunctions (Feb. 15, 1983)). The EPA is, therefore, proposing to add to the final rule an affirmative defense to civil penalties for exceedances of emissions limits that are caused by malfunctions.

See 40 CFR 63.542 (defining "affirmative defense" to mean, in the context of an enforcement proceeding, a response or defense put forward by a defendant, regarding which the defendant has the burden of proof, and the merits of which are independently and objectively evaluated in a judicial or administrative proceeding). We also are proposing other regulatory provisions to specify the elements that are necessary to establish this affirmative defense; the source must prove by a preponderance of the evidence that it has met all of the elements set forth in 40 CFR 63.552 (40 CFR 22.24). The criteria ensure that the affirmative defense is available only where the event that causes an exceedance of the emissions limit meets the narrow definition of malfunction in 40 CFR 63.2 (sudden, infrequent, not reasonable preventable and not caused by poor maintenance and or careless operation). For example, to successfully assert the affirmative defense, the source must prove by a preponderance of the evidence that excess emissions "[w]ere caused by a sudden, infrequent, and unavoidable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner..." The criteria also are designed to ensure that steps are taken to correct the malfunction, to minimize emissions in accordance with 40 CFR 63.543(j) and to prevent future malfunctions. For example, the source must prove by a preponderance of the

evidence that “[r]epairs were made as expeditiously as possible when the applicable emissions limitations were being exceeded...” and that “[a]ll possible steps were taken to minimize the impact of the excess emissions on ambient air quality, the environment and human health...” In any judicial or administrative proceeding, the Administrator may challenge the assertion of the affirmative defense and, if the respondent has not met its burden of proving all of the requirements in the affirmative defense, appropriate penalties may be assessed in accordance with CAA section 113 (see also 40 CFR 22.27).

The EPA included an affirmative defense in the proposed rule in an attempt to balance a tension, inherent in many types of air regulation, to ensure adequate compliance while simultaneously recognizing that despite the most diligent of efforts, emission limits may be exceeded under circumstances beyond the control of the source. The EPA must establish emission standards that “limit the quantity, rate, or concentration of emissions of air pollutants on a continuous basis.” 42 U.S.C. § 7602(k) (defining “emission limitation and emission standard”). See generally *Sierra Club v. EPA*, 551 F.3d 1019, 1021 (D.C. Cir. 2008). Thus, the EPA is required to ensure that section 112 emissions limitations are continuous. The affirmative defense for malfunction events meets this requirement by ensuring that even where there is a malfunction,

the emission limitation is still enforceable through injunctive relief. While "continuous" limitations on the one hand are required, there is also case law indicating that in many situations it is appropriate for the EPA to account for the practical realities of technology. For example, in *Essex Chemical v. Ruckelshaus*, 486 F.2d 427, 433 (D.C. Cir. 1973), the D.C. Circuit acknowledged that in setting standards under CAA section 111 "variant provisions" such as provisions allowing for upsets during startup, shutdown and equipment malfunction "appear necessary to preserve the reasonableness of the standards as a whole and that the record does not support the 'never to be exceeded' standard currently in force." See also, *Portland Cement Association v. Ruckelshaus*, 486 F.2d 375 (D.C. Cir. 1973). Though intervening case law such as *Sierra Club v. EPA* and the CAA 1977 amendments undermine the relevance of these cases today, they support the EPA's view that a system that incorporates some level of flexibility is reasonable. The affirmative defense simply provides for a defense to civil penalties for excess emissions that are proven to be beyond the control of the source. By incorporating an affirmative defense, the EPA has formalized its approach to upset events. In a Clean Water Act setting, the Ninth Circuit required this type of formalized approach when regulating "upsets beyond the control of the permit holder." *Marathon Oil Co. v. EPA*, 564 F.2d 1253,

1272-73 (9th Cir. 1977). But see, *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1057-58 (D.C. Cir. 1978) (holding that an informal approach is adequate). The affirmative defense provisions give the EPA the flexibility to both ensure that its emission limitations are "continuous" as required by 42 U.S.C. §7602(k), and account for unplanned upsets and thus support the reasonableness of the standard as a whole.

D. What are the proposed decisions and actions related to electronic reporting?

Records must be maintained in a form suitable and readily available for expeditious review, according to 63.10(b)(1). Electronic recordkeeping and reporting is available for many records, and is the form considered most suitable for expeditious review if available. Electronic recordkeeping and reporting is encouraged in this proposal and some records and reports are required to be kept in electronic format. Records required to be maintained electronically include the output of continuous monitors and the output of the BLDS. Additionally, standard operating procedures for the BLDS and fugitive emissions control are required to be submitted to the Administrator for approval in electronic format.

VII. Rationale for the Proposed Actions for the Mineral Wool Production Source Category

As discussed in **Section VI.A** of this preamble, we evaluated emissions limits for PM, COS, HF, HCl, formaldehyde, phenol and methanol at mineral wool production facilities. This section of the preamble provides the results of the RTR, our rationale for the proposed actions and decisions concerning changes to the 1999 MACT rule for the Mineral Wool Production source category.

A. What data were used for the NESHAP analyses?

To perform the technology review and residual risk analysis for the Mineral Wool NESHAP, we created a comprehensive dataset based on existing and new test data provided by the 7 mineral wool facilities. As described in **Section IV.C** of this preamble, the voluntary industry survey requested available information regarding process equipment, control devices, point and fugitive emissions, practices used to control fugitive emissions, and other aspects of facility operations. In addition to the industry survey, each owner/operator was asked to submit reports for any recent emissions tests conducted at their facility and to conduct additional emissions tests in 2010 for certain HAP from specific processes. Pollutants tested for the mineral wool source category in 2010 included most HAP metals, CO, PM and certain organic HAP (formaldehyde, phenol, methanol and carbonyl sulfide).

B. What are the proposed decisions regarding surrogacy relationships?

In the 1999 MACT rule, PM serves as the surrogate for metal HAP³⁶ at existing and new cupolas, CO serves as the surrogate for COS at new cupolas and formaldehyde serves as the surrogate for phenol and methanol from curing ovens. The 1999 MACT standard does not have emissions limits for COS, HCl or HF from existing cupolas; limits for phenol or methanol from curing; or emissions limits for any pollutants from collection operations. We are proposing HAP-specific emission limits for these pollutants under CAA section 112(d)(3) in this action. The agency is retaining use of PM as a surrogate for HAP metals. As discussed in **Sections III.B and VII.B.** of this preamble, the Court found that the EPA must set emission limits for each listed HAP (Sierra Club v. EPA, 479 F. 3d 875 (D.C. Cir. March 13, 2007))³, and agreed with the EPA that nothing in the CAA suggests that it is prohibited from resetting the MACT floors in order to correct our own errors. They also agreed that the approach our petitioners labeled "MACT-on-MACT" would be more accurately described as "MACT-on-Unsupportable-Standards-Erroneously-Labeled-as-MACT"³⁷. With regard to the evaluation of potential MACT limits for HAP metals from this source category, consistent with the explanation presented in the proposal of the 1999 MACT

³⁶ The HAP metals emitted from mineral wool cupolas include antimony, arsenic, beryllium, cadmium, chromium, cobalt, mercury, manganese, nickel, lead and selenium.

³⁷ Sierra Club v. EPA, 167 F. 3d 658 (D.C. Cir. March 2, 1999)

rule (NESHAP for Mineral Wool Production, Proposed Rule, June 1, 1997, 64 FR 29490) for this source category describing the appropriateness of PM as a surrogate for HAP metals, we continue to consider PM as an appropriate surrogate for HAP metals in the proposed amendments to the NESHAP in this action.

The agency is proposing emissions limits for phenol and methanol because the concentration of formaldehyde in a specific binder formulation is independent of phenol and/or methanol. The mineral wool industry commented during the small business advocacy review that the binder ingredients and formulation can vary from one mineral wool company to the next, and that the test data from one company is not necessarily relevant for or representative of another company.

In summary, under 112(d)(3) we are proposing emission limits for COS, HF and HCl from cupolas; and for formaldehyde, methanol and phenol from bonded lines.

C. What are the proposed decisions regarding certain unregulated emissions sources?

In the course of evaluating the Mineral Wool Production source category, we identified certain HAP for which we failed to establish emission standards in the original MACT. See National Lime v. EPA, 233 F. 3d 625, 634 (D.C. Cir. 2000) (the EPA has "clear statutory obligation to set emissions standards for each listed HAP"). Specifically, we evaluated emissions

standards for COS, HF and HCl for cupolas and formaldehyde, phenol and methanol for curing ovens and collection operations at mineral wool production facilities, that are not specifically regulated in the existing 1999 MACT standard. We are proposing emissions limits for these pollutants and processes pursuant to 112(d) (2) and 112(d) (3) as discussed in **Section V.A** of this preamble.

D. What are the proposed decisions regarding subcategorization?

The EPA collected information from the mineral wool companies that operate bonded lines to better understand the different equipment designs and whether all collection processes are the same, or whether design and manufacturing process differences warranted consideration of subcategories for the collection process. This process led to the identification of three distinct process design subcategories: vertical, horizontal and drum. Because collection processes only emit HAP if they occur on a bonded line, we are proposing to bundle collection operations and curing ovens together for each of three subcategories and propose new emissions limits for formaldehyde, phenol, and methanol at combined collection/curing on bonded lines. The following discussion involves the rationale for subcategorization of collection operations into three subcategories:

1. The Vertical Collection Design.

During the production of wool fiberglass on a bonded production line using a vertical collection design, the molten rock/slag mixture is poured from the cupola spout onto a group of stainless steel drums spinning in opposite directions. The spinning drums form fine fibers of the mineral mixture. High air volume directs the fibers off the fiberization spinners toward a fast-moving porous vertical conveyor belt. A strong vacuum is drawn on the opposite side of the belt causing the fibers to lie against the vertical belt as it moves upward. At the top of the conveyance, the belt travels around a curve, the vacuum is released, and the fibers are moved onto a second belt that conveys the layer of binder-sprayed mineral wool fibers into the curing oven. Because the conveyor belt is vertical, the air volume drawn through the belt and fiber layer must be very high and the resulting fiber layer that is collected on the belt is thin. In this design, 'shot' (BB-sized black granules that are high in iron as a result of using slag from the iron and steel industry) falls out of the fiber layer. The vertical design is used to produce a specific type of mineral wool that is low in 'shot' and may be used in the hydroponic gardening market as well as in a specialized market of insulation products in which shot is undesirable.

Currently, only one facility operates this type of collection design. Formaldehyde, phenol and methanol MACT floors

for existing, new and reconstructed sources in this subcategory were based on emissions test runs for combined curing and collection operations from this facility.

2. The Horizontal Collection Design.

Horizontal collection is similar to vertical collection, but because the conveyor belt is horizontal it works with gravitational forces. The layer of mineral wool collected on a horizontal belt is thinner than that collected on a vertical belt, and the 'shot' is not selectively removed. The air volume that is drawn through the fiber layer is much lower than in the vertical design, and therefore the air stream is conducive to thermal oxidation at the hottest part of the cupola exhaust stack or the existing thermal oxidizer on the curing oven.

Currently, only one facility operates this type of collection design. Formaldehyde, phenol and methanol MACT floors for existing, new and reconstructed sources in this subcategory were based on emissions test runs for combined curing and collection operations from this facility.

3. The Drum Collection Design.

In the drum collection design, fibers are drawn using a very high volume air flow into the center of a rotating drum. The sides of the rotating drum have small holes that allow the air flow to exit, but which trap the fibers. The angle of the drum and the use of a vacuum and centrifugal force pull the

fibers against the inside wall of the drum and out the end. The entire drum is enclosed and the air flow may be vented to the hottest part of the cupola exhaust stack or to the existing thermal oxidizer on the curing oven.

Currently, only one facility operates this type of collection. Formaldehyde, phenol, and methanol MACT floors for existing, new, and reconstructed sources in this subcategory were based on emissions test runs for combined curing and collection operations from this facility.

E. What are the results from the risk assessments performed and the proposed decisions for the Mineral Wool Production Source Category?

As described in **Section V.A** of this preamble, we conducted an inhalation risk assessment for all HAP emitted from the Mineral Wool Production source category. We also conducted multipathway screenings for cadmium, mercury, and lead. Details of the risk assessments and additional analyses can be found in the draft residual risk documentation referenced in **Section V.A** of this preamble, which is available in the docket for this action. The agency considered the available health information - the MIR; the numbers of persons in various risk ranges; cancer incidence; the maximum non-cancer HI; the maximum acute non-cancer hazard; the extent of non-cancer risks; the potential for adverse environmental effects; and the distribution of risks in

the exposed population (54 FR 38044, September 14, 1989) - in developing the proposed CAA section 112(f)(2) standards for the Mineral Wool Production source category.

1. Inhalation Risk Assessment Results for the Mineral Wool Production Source Category.

Table 7 of this preamble provides an overall summary of the results of the inhalation risk assessment.

Table 7. Mineral Wool Production Inhalation Risk Assessment Results

Maximum Individual Cancer Risk (in 1 million) ¹		Estimated Population at increased Risk of cancer ≥ 1-in-1 Million	Estimated Annual Cancer Incidence (cases per year)	Maximum Chronic Non-cancer TOSHI ²		Maximum Screening Acute Non-cancer HQ ³
Based on Actual Emissions Level	Based on Allowable Emissions Level			Based on Actual Emissions Level	Based on Allowable Emissions Level	
4	10	1,650	0.0004	0.04	0.1	8 (REL) 0.4 (AEGL-1, ERGP-1)

¹ Estimated maximum individual excess lifetime cancer risk due to HAP emissions from the source category.

² Maximum TOSHI. The highest TOSHI for the Mineral Wool Production source category is for the respiratory system.

³ The maximum HQ acute value of 8 is driven by emissions of formaldehyde. It is also based on a refined emissions multiplier of 3 which was used to estimate the peak hourly emission rates from the average rates. See section V.A. of this preamble for explanation of acute dose-response values.

The results of the chronic inhalation cancer risk assessment indicate that, based on estimates of current actual emissions, the MIR could be up to 4-in-1 million, with formaldehyde primarily driving these risks. The total estimated cancer incidence from this source category based on actual emission levels is 0.0004 excess cancer cases per year or one

case in every 2,500 years, with emissions of formaldehyde and arsenic compounds contributing 64 percent and 33 percent, respectively, to this cancer incidence³⁸. In addition, we note that no persons are estimated to have cancer risks greater than 10-in-1 million, and approximately 1,650 people are estimated to have risks greater than 1-in-1 million as a result of emissions from 1 facility. When considering the risks associated with MACT-allowable emissions, the MIR could be up to 10-in-1 million. The maximum modeled chronic non-cancer TOSHI value for the Mineral Wool Production source category could be up to 0.04 with emissions of formaldehyde dominating those impacts, indicating no significant potential for chronic non-cancer impacts.

Our screening analysis for worst-case acute impacts indicates the potential for only one pollutant, formaldehyde, to exceed an HQ value of 1 at only one facility in this source category, with a potential maximum HQ up to 8. A refined emissions multiplier of 3 was used to estimate the peak hourly emission rates from the average rates. Refer to Appendix 7 of

³⁸ We note that the MIR for this source category would not change if the CIIT URE for formaldehyde had been used in the assessment, although the total cancer incidence would decrease by 52 percent. The MIR for the source category would remain at 40 due to Cr(VI). There is an ongoing IRIS reassessment for formaldehyde, and future RTR risk assessments will use the cancer potency for formaldehyde that results from that reassessment. As a result, the current results may not match those of future assessments.

the draft residual risk document in the docket for a detailed description of how the refined emissions multiplier was developed for the Mineral Wool Production source category. The worst-case acute impact estimate occurs at a facility that is located in a rural area with a small population. Since the acute modeling scenario is worst-case because of its confluence of peak emission rates and worst-case dispersion conditions, and since the HQ estimates for formaldehyde based on the AEGL-1 and ERPG-1 values for this facility are well below 1, we are proposing to find that acute noncancer health impacts of concern are unlikely.

With respect to the potential for adverse environmental effects from non PB-HAP, we note that there is a lack of information about specific adverse environmental effects occurring at given concentrations of the HAP emitted by this source category. However, given that all chronic non-cancer HQ values considering actual emissions are less than 1 using human health reference values, we believe that it is unlikely that adverse environmental effects would occur at the actual HAP concentrations estimated in our human health risk assessment.

2. Multipathway Risk Assessments and Results.

There were no exceedances of screening emissions rates for the PB HAP emitted by the facilities in the Mineral Wool

Production source category, thus we have no concerns about potential multi-pathway risks from this source category.

3. Facility Wide Risk Assessment Results.

For all facilities in this source category, there are no other significant HAP emissions sources present beyond those included in the source category. All significant HAP sources have been included in the source category risk analysis. Therefore, we conclude that the facility wide risks are essentially the same as the source category risks.

F. What are our proposed decisions for the Mineral Wool Production source category based on risk acceptability and ample margin of safety?

1. Risk Acceptability

As noted in **Section V.A** of this preamble, we weigh all health risk factors in our risk acceptability determination, including the MIR; the numbers of persons in various risk ranges; cancer incidence; the maximum noncancer HI; the maximum acute noncancer hazard; the extent of noncancer risks; the potential for adverse environmental effects; and distribution of risks in the exposed population; and risk estimation uncertainty (54 FR 38044, September 14, 1989) in developing the proposed CAA section 112(f)(2) standards for this source category.

Based on the inhalation risk assessment, we estimate that the cancer risks to the individual most exposed could be up to

4-in-1 million due to actual emissions and up to 10-in-1 million due to MACT-allowable emissions, mainly due to formaldehyde stack emissions. We estimate that the incidence of cancer based on actual emissions is 0.0004 excess cancer cases per year or one case every 2,500 years, and that about 1,650 people face a cancer risk greater than 1-in-1 million due to HAP emissions from this source category. Our assessments also indicated a low potential for HAP emissions from these sources to pose any significant adverse environmental effects or human health multi-pathway risks or chronic noncancer human health risks due to inhalation. While our acute risk screening ruled out the possibility of acute impacts of concern for all pollutants except for formaldehyde at one facility, we ultimately concluded that the potential for acute impacts of concern at this facility is low. The risk assessment for this source category was largely based on facility-specific stack test data and emissions estimates, indicating a high degree of confidence in the results. Considering all of the above information, we are proposing that the current risks due to actual HAP emissions from this source category are acceptable.

While the estimated chronic risks associated with MACT-allowable emissions from this source category are slightly higher than risk estimates based on actual emission levels, they are still well below 100 in one million and there are no other

significant risks. Therefore, we propose the risks due to allowable emissions are also acceptable.

2. Ample Margin of Safety.

As explained earlier in **Section V** of this preamble, the agency again considers all of the health risks and other health information considered in the first step. Beyond that information, we evaluate the cost and feasibility of available control technologies and other measures (including the controls, measures and costs reviewed under the technology review) that could be applied in this source category to further reduce the risks due to emissions of HAP identified in our risk assessment.

Based on our research and analyses as discussed in **Section V.C** of this preamble, we have not identified any feasible control options beyond what we are requiring in our proposed standards for emissions sources described above, and are therefore not proposing additional controls, under section 112(f)(2). Therefore, we are proposing that the MACT standards for the mineral wool production source category, as revised per above, provide an ample margin of safety to protect public health and prevent adverse environmental effects.

Nevertheless, we are soliciting comments and information regarding additional control measures and work practices that may be available and their feasibility in further reducing stack emissions of COS, HF, HCl, formaldehyde, phenol, and methanol,

or additional monitoring that may be warranted to ensure adequate control of these emissions.

G. What are the results from the technology review and proposed decisions?

Based on our technology review, we believe that the reductions in HAP emissions since promulgation of the 1999 Mineral Wool Production MACT rule are directly related to improvements in two areas: (1) improvements in fabric filter control technology (e.g., improved bag materials, replacement of older baghouses) and (2) addition of regenerative thermal oxidizers (RTOs) and oxygen injection to control emissions from cupolas. Additional reductions have been achieved due to the use of low-sulfur raw materials at one facility. The RTOs and lower sulfur raw materials are discussed above (in **Section VII.C** of this preamble) since these controls and measures are relevant to development of the MACT standards for COS and other organic HAPs under Section 112(d)(2) of the CAA, and in the beyond the floor analyses (described in **Section VII.C** of this preamble) that we also do as part of the MACT standard evaluations under Section 112(d)(2) and 112(d)(3).

In this section, as part of our technology review, we describe developments in development in fabric filter technologies and the relationship to PM emissions.

Slight improvements in fabric filter control technology are reflected in the emissions test data collected under the industry survey. The emissions limit for PM under the 1999 MACT rule is a production-based limit of 0.1 pounds of PM per ton of melt for new and existing cupolas. Based on our analysis of survey responses and test data collected under the industry survey, this industry primarily uses fabric filters to control emissions of metal HAP, and sources affected by the current PM limit are achieving PM concentrations at control device outlets that are only slightly below the current limit (see Technology Review for the Mineral Wool Production Manufacturing Source Category). Given fluctuations in control device performance and mineral wool production fluctuations, we do not believe that developments in practices, processes, and control technologies warrant revisions to the PM limit in the 1999 MACT rule to reflect HAP metal emissions levels achieved in practice.

Moreover, the RBLC did not identify any practices, processes, or control technologies applicable to the emission sources in this source category that were not identified and evaluated during the original MACT development.

In summary, we have not identified any additional relevant cost-effective developments in technologies, practices or processes since promulgation of the MACT rule to further reduce HAP emissions. Therefore, we are not proposing any changes to

the MACT standards in this action as a result of our technology review under Section 112(d)(6) for Mineral Wool Production.

Additional details regarding these analyses can be found in the following technical document for this action which is available in the docket: Technology Review for the Mineral Wool Production Manufacturing Source Category.

VIII. Rationale for the Proposed Actions for the Wool Fiberglass Manufacturing Source Category

As discussed in **Section VI.B** of this preamble, we evaluated emissions limits for PM, chromium compounds, HF, HCl, formaldehyde, phenol, and methanol at wool fiberglass manufacturing facilities. This section of the preamble provides the results of the RTR, our rationale for the proposed actions for the Wool Fiberglass Manufacturing source category, and our proposed decisions concerning changes to the 1999 MACT rule.

A. What data were used for the NESHAP analyses?

To perform the technology review and residual risk analysis for the Wool Fiberglass Manufacturing NESHAP, we created a comprehensive dataset based on existing and new test data provided by 26 of the 29 wool fiberglass facilities. As described in **Section IV.C** of this preamble, the voluntary industry survey requested available information regarding process equipment, control devices, point and fugitive emissions, practices used to control fugitive emissions, and

other aspects of facility operations. In addition to the ICR survey, each facility was asked to submit reports for any recent emissions tests conducted and to conduct additional emissions tests in 2010 for certain HAP from specific processes.

Pollutants tested for the wool fiberglass source category in 2010 included most HAP metals, PM, and certain organic HAP (HF, HCl, formaldehyde, phenol, and methanol).

As discussed in **Section IV.C** above, in the emissions testing for the survey, industry requested to conduct emission testing on furnaces they believed were representative of the other furnaces in operation. The EPA and industry agreed that the bases for representativeness would include a variety of factors such as processing the same materials, producing the same products and being the same type of furnace. Furnace construction and refractory composition were not factors that were presented by industry as having an effect on HAP emissions, and those factors were not used as a basis of representativeness for the resulting data set. During analysis of the test data, the EPA discovered high emissions of chromium compounds, including hexavalent chromium, and that these emissions were mostly from certain furnaces constructed of high chrome refractories.

The Wool Fiberglass Manufacturing source category consists of 29 facilities with 80 furnaces, 54 RS manufacturing lines and

less than 30 FA manufacturing lines. Since there are more than 30 furnaces and RS lines, we based the MACT floor limits on the average emissions limitation achieved by the best performing 12 percent of sources. Therefore, the MACT floor for HF and HCl from glass-melting furnaces was based on the 10 best performing furnaces; the 7 best performing RS lines; and the 5 best performing FA lines.

The stack test data were used to calculate the MACT floors using the 99 percent UPL for glass-melting furnaces, RS manufacturing lines, and FA manufacturing lines from wool fiberglass manufacturing plants. The UPL analysis is explained in more detail in MACT Floor Analysis for the Wool Fiberglass Manufacturing Source Category, which is available in the docket for this proposed action. The results from the MACT floor analysis are presented in **Section VI.B** of this preamble.

B. What are the proposed decisions regarding surrogacy relationships?

A surrogate approach is used to allow for easier and less expensive measurement and monitoring requirements. In the 1999 MACT rule for this source category, PM serves as the surrogate for metal HAPs³⁹ at existing and new glass-melting furnaces and

³⁹ The HAP metals emitted from wool fiberglass glass-melting furnaces include antimony, arsenic, beryllium, cadmium, chromium, cobalt, mercury, manganese, nickel, lead, and selenium.

formaldehyde serves as the surrogate for phenol and methanol from forming and curing at RS manufacturing lines and forming and curing at FA manufacturing lines. As described in **Sections III.B and VIII.B** in this preamble, the court found that the EPA erred when we did not set emission limits for each HAP emitted by industry processes in the MACT standards.⁴⁰ Therefore, the agency is proposing HAP-specific emissions limits for phenol and methanol.

C. What are the proposed decisions regarding certain unregulated emissions sources?

As discussed earlier in **Section VI.B** of this preamble, we identified certain HAP for which we failed to establish emission standards in the original 1999 MACT. In the 1999 MACT rule, we used formaldehyde as a surrogate for phenol and methanol, and we did not establish HAP-specific emission limits for phenol, methanol, HF and HCl. For this action we evaluated emissions standards for HF, HCl, phenol, and methanol at wool fiberglass manufacturing facilities, described below, that are not specifically regulated in the existing 1999 MACT standard. The EPA is therefore proposing to set emissions limits for these HAP emissions, under CAA section 112(d)(3) in this action.

⁴⁰ *Sierra Club v. EPA*, 479 F. 3d 875 (D.C. Cir. March 13, 2007).

D. What are the results from the risk assessments and analyses and the proposed decisions for the Wool Fiberglass Manufacturing Source Category?

An inhalation risk assessment was completed for all HAP emitted for the Wool Fiberglass Manufacturing source category. Details of the risk assessments and additional analyses can be found in the residual risk documentation referenced in **Section V.A** of this preamble. The agency considered the available health information -- the MIR; the numbers of persons in various risk ranges; cancer incidence; the maximum non-cancer HI; the maximum acute non-cancer hazard; the extent of non-cancer risks; the potential for adverse environmental effects; and distribution of risks in the exposed population (54 FR 38044, September 14, 1989) - in developing the proposed CAA section 112(f)(2) standards for the Wool Fiberglass Manufacturing source category.

1. Inhalation Risk Assessment Results for the Wool Fiberglass Manufacturing Source Category.

Table 8 of this preamble provides an overall summary of the results of the inhalation risk assessment.

Table 8. Wool Fiberglass Manufacturing Inhalation Risk Assessment Results

Maximum Individual Cancer Risk (in 1 million) ¹		Estimated Population at increased Risk of cancer ≥ 1-in-1 Million	Estimated Annual Cancer Incidence (cases per year)	Maximum Chronic Non-cancer TOSHI ²		Maximum Screening Acute Non-cancer HQ ³
Based on Actual Emissions Level	Based on Allowable Emissions Level			Based on Actual Emissions Level	Based on Allowable Emissions Level	

40	60	849,000	0.05	0.2	0.5	30 (REL) 2 (AEGL-1, ERPG-1)
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¹ Estimated maximum individual excess lifetime cancer risk due to HAP emissions from the source category. Hexavalent chromium is the primary driver for cancer risk.

² Maximum TOSHI. The highest TOSHI for the Wool Fiberglass Manufacturing source category is for the respiratory system.

³ The maximum HQ acute value of 30 is driven by emissions of formaldehyde. See section V.A. of this preamble for explanation of acute dose-response values.

The results of the chronic inhalation cancer risk assessment indicate that, based on estimates of current actual emissions, the maximum individual lifetime cancer risk (MIR) could be up to 40-in-1 million. The major contributor to this cancer risk is hexavalent chromium that is emitted from the furnace refractory brick. The greatest amount of hexavalent chromium emitted from a single source is from a facility that currently uses a type of refractory brick that is made almost entirely of chromium compounds. In addition, we note that approximately 12,000 people are estimated to have cancer risks greater than 10-in-1 million as a result of formaldehyde and hexavalent chromium emissions at 2 facilities, and approximately 849,000 people are estimated to have risks greater than 1-in-1 million as a result of formaldehyde and hexavalent chromium emissions from 15 facilities. The maximum estimated chronic non-cancer TOSHI value for the Wool Fiberglass Manufacturing source category is 0.2 with emissions of formaldehyde dominating those

impacts, indicating no significant potential for chronic non-cancer impacts.

Based on the acute REL to assess possible acute non-cancer effects due to emissions of formaldehyde, our analysis indicates that the maximum acute HQ value could exceed a value of 1 at a total of 7 facilities due to formaldehyde emissions⁴¹, with one facility in this source category indicating the potential to create a maximum worst-case HQ value up to 30. This maximum worst-case acute impact corresponds to a maximum HQ of 2 based on the AEGL-1 and ERPG-1 levels for formaldehyde. Altogether, these results indicate that we cannot rule out the potential for formaldehyde emissions from this source category to cause acute impacts of mild concern, such as eye and nose irritation. Repeated exposures to these levels (i.e., at or above the AEGL-1 and ERPG-1) could cause further health concerns.

With respect to the potential for adverse environmental effects from non PB-HAP, we note that that there is a lack of information about specific adverse environmental effects occurring at given concentrations for the HAP emitted by this source category. However, given that all chronic non-cancer HQ values considering actual emissions are less than 1 using human health reference values, we believe that it is unlikely that

⁴¹ Individual facility acute HQ values for all facilities can be found in Appendix 6 of the risk assessment document that is included in the docket for this proposed rulemaking.

adverse environmental effects would occur at the actual HAP concentrations estimated in our human health risk assessment.

2. Auxiliary Risk Characterization.

As indicated in **Section VIII.D.1** above, the MIR for the Wool Fiberglass Manufacturing source category could be up to 40-in-1-million based on actual emissions. The major contributor to this cancer risk is hexavalent chromium. The greatest amount of risk is from one facility that uses a type of refractory brick that is described by the company as "high chrome"^{12,13}. (Notes of April 14, 2011, Certainteed); (Region 7 Certainteed Notes).

Because the use of high chrome refractories extends the life of the furnace from a maximum of 10 years to at least 15 years, and the cost of furnace construction is increased by about 15 percent when it is reconstructed using high chrome refractories¹² (Notes of April 14, 2011, Certainteed) we believe that there is a financial incentive for other facilities to switch to this high chromium refractory at the time they rebuild their furnaces. For this reason, we performed an auxiliary risk characterization analysis to assess the potential maximum individual lifetime cancer risks in the event that the other 28 Wool Fiberglass facilities switch to the high chromium brick. For the auxiliary risk characterization analysis it was assumed that the hexavalent chromium emissions for each facility would be the same as that for the facility with annual emissions of

420 lbs of hexavalent chromium per furnace. Table 9 of this preamble provides a summary of the results of this auxiliary inhalation risk assessment.

Table 9. Wool Fiberglass Manufacturing Auxiliary Inhalation Risk Assessment Results

Potential Maximum Individual Cancer Risk (in 1 million) ¹	Estimated Population at increased Risk of cancer \geq 1-in-1 Million	Estimated Population at increased Risk of cancer \geq 10-in-1 Million	Estimated Population at increased Risk of cancer \geq 100-in-1 Million	Estimated Annual Cancer Incidence (cases per year)
Based on Actual Emissions Level				
900	7,300,000	460,000	8,100	0.46

¹ Estimated maximum individual excess lifetime cancer risk due to HAP emissions from the source category.

The results of the auxiliary analysis indicate that, under this scenario, the estimated emissions from 14 facilities could lead to maximum individual lifetime cancer risks greater than 100-in-1-million, with the highest emitting facility posing a potential maximum individual risk of 900-in-1-million. Under this scenario, 8,100 people would be exposed to risks greater than 100-in-1-million, 460,000 people would be exposed to risks of greater than 10-in-1-million, and over 7 million people would be exposed to cancer risks of greater than 1-in-1-million.

In summary, the auxiliary risk analysis indicates that if other facilities switch to high chromium refractory, emissions of hexavalent chromium could potentially pose unacceptable risks to public health due to inhalation exposures resulting from stack emissions of hexavalent chromium.

3. Multipathway Risk Assessments and Results.

None of the facilities in the Wool Fiberglass Manufacturing source category reported emissions of PB HAP that were greater than the screening emission rates. Therefore, multi-pathway exposures and environmental risks were deemed negligible.

4. Facility Wide Risk Assessment Results.

For this source category, there are no other significant HAP emissions sources present beyond those included in the source category. All significant HAP sources have been included in the source category risk analysis. Therefore, we conclude that the facility wide risk is essentially the same as the source category risk and that no separate facility wide analysis is necessary.

E. What are our proposed decisions for the Wool Fiberglass Manufacturing source category based on risk acceptability and ample margin of safety?

1. Risk Acceptability.

As noted in **Section VIII.D** of this preamble, we weigh all health risk factors in our risk acceptability determination, including the MIR; the numbers of persons in various risk ranges; cancer incidence; the maximum noncancer HI; the maximum acute noncancer hazard; the extent of noncancer risks; the potential for adverse environmental effects; and distribution of risks in the exposed population; and risk estimation uncertainty

(54 FR 38044, September 14, 1989) in developing the proposed CAA section 112(f)(2) standards for this source category.

Based on the inhalation risk assessment, we estimate that the cancer risks to the individual most exposed could be up to as 40-in-1 million due to actual emissions and up to as 60-in-1 million due to MACT-allowable emissions, mainly due to formaldehyde and chromium stack emissions. We estimate that the incidence of cancer based on actual emissions is 0.05 excess cancer cases per year or one case every 20 years, and that about 850,000 people face a cancer risk greater than 1-in-1 million due to the HAP emissions from this source category.

Our assessments also indicate a low potential for HAP emissions from these sources to pose any significant adverse environmental effects, human health multi-pathway effects, or chronic noncancer human health risks. Our acute risk screening ruled out the possibility of acute impacts of concern for all pollutants but one, formaldehyde, at seven facilities, with a maximum worst-case HQ estimated to be 30 based on the REL and 2 based on the AEGL-1 (or ERPG-1, which is equivalent). While this means we cannot rule out the potential for acute concerns due to formaldehyde emissions from these facilities, we note that the use of formaldehyde is being phased out in this industry, and will be eliminated from all but 2 facilities in the source category. Since the cancer risks due to actual and allowable

emissions (based on the current composition of refractory bricks used by this source category) are well within the acceptable range (i.e., less than 100-in-1 million) and since we have no additional significant concerns regarding other potential human health or environmental impacts, we are proposing that the current risk levels due to actual and MACT-allowable emissions are acceptable.

2. Ample Margin of Safety Analysis and Proposed Decisions.

As described above, we are proposing that the risks associated with the actual and MACT-allowable stack emissions from this source category are acceptable based on the current composition of refractory bricks used by this source category. However, as discussed in **Section VIII.D(2)** of this preamble, if other wool fiberglass facilities reconstructed their furnaces with high chromium refractory bricks, the maximum individual cancer risks would be higher and likely result in a finding of unacceptable risks.

According to our 2-step process for assessing risks, after we evaluate whether risks are 'acceptable' we evaluate whether cost effective measures are available to reduce risks further, to provide an 'ample margin of safety'. As stated in **Section VIII.F** of this preamble, both NaOH scrubbers and a furnace rebuild are considered cost effective when hexavalent chromium levels are high. NaOH scrubbers achieve at least 95 percent

reduction in hexavalent chromium emissions at other industries. Transferring this technology to the wool fiberglass industry is reasonable and would reduce hexavalent chromium to levels that would achieve an ample margin of safety. Therefore, we are proposing emission limits of 0.06 lb of total chromium compounds per thousand tons (or 60 lb of total chromium compounds per million tons) of glass pulled in this action (as presented in Table 10) under Section 112(f)(2) of the CAA in this action. We believe this limit would achieve an ample margin of safety to protect public health and prevent adverse environmental effects.

Table 10. Proposed Emissions limits for Glass-Melting Furnaces based on Risk Review

Pollutant	Pounds of pollutant per thousand tons of melt
Chromium Compounds	0.06

These emission limits apply to furnaces at major sources in the wool fiberglass manufacturing source category. However, there are no differences in furnaces at major sources and area sources. We are concerned about the levels of hexavalent chromium that can be emitted by area sources where furnaces may be constructed using high chrome refractories. Therefore we plan to collect additional information from industry to inform regulation of area sources in a future action.

The emission limits we are proposing for chromium compounds under 112(f)(2) are identical to the chromium compounds limits

we are proposing under 112(d)(6), as described in **Section VIII.F** of this preamble.

Our assessments also indicate a low potential for HAP emissions from these sources to pose any significant adverse environmental effects, human health multi-pathway effects, or chronic noncancer human health risks. Our acute risk screening ruled out the possibility of acute impacts of concern for all pollutants but one, formaldehyde, at seven facilities, with a maximum worst-case HQ estimated to be 30 based on the REL and 2 based on the AEGL-1 or ERPG-1, which is equivalent (formaldehyde). While this means we cannot rule out the potential for acute concerns due to formaldehyde emissions from these facilities, we note that the worst-case acute HQs are based on conservative assumptions (e.g., worst-case meteorology coinciding with peak short-term one-hour emissions from each emission point, with a person located at the point of maximum concentration during that hour). Moreover, the use of formaldehyde is being phased out in this industry, and will be eliminated from all but 2 facilities in the source category. Since the cancer risks due to actual emissions are well within the acceptable range (i.e., less than 100-in-1 million) and since we have no additional significant concerns regarding other potential human health or environmental impacts, and since we have not identified any additional cost-effective controls to

further reduce formaldehyde emissions, we are proposing that the MACT rule along with all the proposed amendments described above (including the emissions limits for chromium and formaldehyde) will provide an ample margin of safety to protect public health and prevent adverse environmental effects.

We are soliciting comments and information regarding additional control measures, work practices that may be available, and their feasibility in further reducing emissions of formaldehyde, chromium compounds, HCl, and HF, or additional monitoring that may be warranted to ensure adequate control of stack emissions. We specifically request information on other criteria on which a chromium compounds emission limit should be based that would reduce risks from hexavalent chromium.

3. Analysis of the resulting risk after the proposed requirements are in place.

We conducted an assessment to estimate the risks based on a post-control scenario reflecting all the proposed requirements for the emissions described above (including the proposed emissions limit for chromium compounds). Details are provided in the Draft Residual Risk Assessment for the Mineral Wool Production and Wool Fiberglass Manufacturing Source Categories, EPA's Office of Air Quality Planning and Standards Office of Air and Radiation, September 2011, which is available in the docket to this rule.

Table 11 of this preamble provides an overall summary of the results of the post-control inhalation risk assessment. As compared to Table 8, the MIR decreased from 40-in-1 million to 20-in-1 million, primarily as a result of one facility replacing the high chrome refractory bricks at the facilities that currently exceed the proposed chromium standard. These estimates are based on the dataset compiled using the industry's emissions test data from their 2010 industry survey responses, which show three furnaces would have to reduce chromium emissions to meet the limit in the proposed rule.

Table 11. Post Control Inhalation Risk Estimates for Wool Fiberglass (result of Chromium control)

Maximum Individual Cancer Risk (in 1 million) Based on Actual Emissions Level ¹	Estimated Population at increased Risk of cancer ≥ 1-in-1 Million	Estimated Annual Cancer Incidence (cases per year)	Maximum Chronic Non-cancer TOSHI Based on Actual Emissions Level ²	Maximum Screening Acute Non-cancer HQ ³
20	282,000	0.02	0.2	30

In addition, we estimated that the formaldehyde emissions would be at or below the MACT standard for all facilities once this rule is fully implemented and we are not proposing that additional control options be implemented.

In a letter dated June 8, 2011, the industry trade association (NAIMA) stated that "NAIMA can provide documentation that all major sources have already converted or have announced plans to convert to non-phenol formaldehyde binders. Essentially

non-formaldehyde binders are or will be used industry-wide." A copy of this letter has been placed in the docket for this action (see NAIMA's Response for the Fiberglass Industry to EPA's Formaldehyde and Collection Questions). Based on this information and the information provided by the industry in their 2010 survey, we estimate that 27 of the 29 wool fiberglass manufacturing facilities will have HAP emissions below the 10 and 25 tpy thresholds and will not be subject to the major source MACT requirements. We further estimate that there may be two facilities manufacturing pipe insulation or heavy density insulation products that will be major sources of HAP emissions on the compliance date of these proposed amendments to subpart NNN. If NAIMA is correct in that formaldehyde will be phased out by the compliance date of these proposed amendments, we anticipate that the estimated inhalation risks due to formaldehyde would further decrease.

In summary, we are proposing that the MACT standard, with the changes we are proposing in this action, will provide an ample margin of safety and prevent adverse environmental effects.

F. What are the results from the technology review and proposed decisions?

Based on our technology review, we determined that there have been advances in emissions control measures since the Wool

Fiberglass Manufacturing NESHAP was originally promulgated in 1999. Since promulgation, we estimate that industry-wide metal HAP emissions from process sources have been reduced by approximately 76 percent. Due to industry's efforts to replace phenol-formaldehyde binders, more than 95 percent of formaldehyde, phenol, and methanol emissions have been reduced (or will be by 2012). As a result actual PM (metal HAP), formaldehyde, phenol, and methanol emissions from process sources at all wool fiberglass manufacturing facilities are significantly lower than are allowed under the 1999 MACT rule.

We believe that the reductions in metal HAP emissions since promulgation of the 1999 MACT rule are mainly directly related to improvements in two areas: (1) improvements in fabric filter control technology (e.g., improved bag materials, replacement of older baghouses) and (2) the use of electrostatic precipitators (ESPs). Our review also indicates that high chrome refractories are a new technology used in wool fiberglass furnaces that the available data indicate result in an increase in emissions of chromium compounds. The results of our analyses and our proposed decisions for these areas under CAA section 112(d)(6) are presented in the following sections. Based on these data, we believe that developments in practices, processes, and control technologies warrant revisions to the 1999 NESHAP. Additional

details regarding these analyses can be found in Technology Review for the Wool Fiberglass Manufacturing Source Category.

The improvements in fabric filter control technology are reflected in the emissions test data collected under the industry survey. Two types of PM control are used in the wool fiberglass manufacturing industry: fabric filters (baghouses) and electrostatic precipitators. Electrostatic precipitators (ESP) may be configured as either wet ESPs or dry ESPs. The emissions limit for PM under the 1999 MACT rule is a production-based limit of 0.5 pounds of PM per ton of glass pulled applicable to all glass melting furnaces. Based on our analysis of survey responses and test data collected under the industry survey, this industry primarily uses fabric filters to control emissions of metal HAP, and the vast majority of sources affected by the current PM limit are achieving PM emissions at control device outlets that are far below the current limit. Id.

Most, if not all, sources reported PM emissions (coming out of the stacks after the control devices) that are less than 10 percent of the current limit, with several sources achieving PM emissions that are two to three orders of magnitude lower than the current limit. Based on these data, we believe that developments in practices, processes, and control technologies warrant revisions to the 1999 MACT rule, under section 112(d)(6). Our analysis of emissions data provided in the survey

conducted by industry indicates that stacks equipped with a well-performing fabric filter or ESP can achieve exhaust PM concentrations of less than 0.014 lb/ton of glass pulled. We estimate that all of the wool fiberglass facilities would be able to comply with this revised limit without additional controls. We estimate that this would result in small reductions of metal HAP emissions since there will only be a couple of facilities subject to the PM limits and the available data on some of the furnaces at those facilities indicates they are currently meeting the proposed PM emission limit. We do not anticipate additional energy use associated with this revised limit. Furthermore, we do not anticipate any adverse non-air environmental impacts associated with the implementation of this revised limit. Therefore, we are proposing that reducing the PM limit in the NESHAP from 0.50 lb of PM per ton of glass pulled to 0.014 lb of PM per ton of glass pulled (see Table 12) is both feasible and cost effective. Therefore, we are proposing a revised PM limit in the NESHAP of 0.014 lb of PM per ton of glass pulled in this action. We have based these statements on information we received from the industry in their survey responses; nevertheless, we are seeking comment on our estimation that all wool fiberglass manufacturers can meet the PM emission limits without additional controls.

We conducted a review of the available test data for chromium compounds including hexavalent chromium emissions from glass furnaces. We found that for most furnaces, measured emissions were near or below detection limits of the methods used for testing (EPA Method 29 followed by EPA Method 0061). In contrast, the chromium emissions for a few furnaces were several orders of magnitude higher than the rest of the industry. The facility emitting the highest level of hexavalent chromium, at 840 lb/yr, advised us that the reason chromium tested very high was due to the refractory products, high chrome refractories, from which the furnaces are constructed (Notes of April 14, 2011, Certainteed)¹². Based on the emissions testing and information on high chrome refractories, we believe changes to the 1999 MACT rule are warranted under CAA section 112(d)(6).

The data indicate that well performing wool fiberglass furnaces emit small amounts of chromium compounds, that is, they emit less than 0.06 pounds of chromium compounds (Cr) per thousand tons of glass pulled. However, three facilities currently operate furnaces that emit chromium in excess of this rate. Chromium emissions from these high emitters range from 9 to 840 lb/yr. Furnaces operating below this rate generally emit less than 1 pound per year; many of these tested below the detection level of the test method. The data indicate that there is a 'break' between the furnaces emitting less than the

proposed limit and those emitting greater amounts of chromium. Data further indicate there are no wool fiberglass manufacturers with low glass production rates but high levels of chrome emissions. We are therefore proposing to set a chromium compounds emission limit of 0.06 lb of chromium per thousand tons of glass pulled as shown in Table 12.

Under section 112(d)(6), we are proposing this emission limit for chromium compounds taking into account the developments in practices, processes and technology by the wool fiberglass industry since promulgation of the 1999 MACT standard. The emission limits we are proposing for chromium compounds under 112(d)(6) are identical to the chromium compounds limits we are proposing under 112(f)(2), as described in **Section VIII.E** of this preamble.

We estimate that the 2 remaining major source wool fiberglass facilities would be able to comply with this chromium compounds emission limit. We estimate that if the high chromium emitting facilities remain major sources, these new emission limits would result in annual reductions of 1,155 pounds of chromium compounds, specifically hexavalent chromium and there will be no reductions at the remaining facilities because data indicate they are currently meeting the proposed chromium emission limit.

Wet scrubbers are not generally in use in this industry. However, we evaluated their use to achieve reductions in hexavalent chromium for furnaces emitting chrome above the levels being proposed. Sodium hydroxide (NaOH) scrubbers are in use for furnace operations at other industries for chromium compounds reduction. We have evaluated the use of NaOH scrubbers for the wool fiberglass manufacturing industry and find that the control technology can be adapted for use in the wool fiberglass industry from the chromium electroplating industry and from certain high temperature metallurgical industries.⁴²

We do anticipate an additional energy use associated with this revised limit if sources choose to install NaOH scrubbers to remove hexavalent chromium from the furnace gases. We anticipate the affected sources may incur disposal costs of hexavalent chromium contaminated materials associated with the implementation of this emission limit. We anticipate that two sources which currently emit chromium at levels slightly higher than the proposed limit will be able to meet it by installing NaOH scrubbers (which selectively remove the hexavalent form of chromium from the exhaust air). This cost is about \$300 per pound hexavalent chromium removed if these companies install a NaOH scrubber in series with the existing furnace control. A

⁴² NaOH Scrubber Information. Telephone discussion and emails between vendors, companies, and EPA. Steffan Johnson, Measurement Policy Group, USEPA/OAQPS/SPPD.

wool fiberglass facility could also choose to rebuild the glass furnace using refractories with low chromium contents. The cost of that option would be prorated to consider the remaining useful life of the existing high chromium furnace and would cost about \$12,000 per pound chromium compounds removed. We expect that for the highest chromium emitting wool fiberglass furnace emitting 500 lb chromium per year, this option would be used to meet the proposed limit. We base this estimate on two factors: 1) the furnace is at the end of its useful life and is expected to be reconstructed in 2013 (Notes of April 14, 2011; Region 7 Certainteed Notes)^{12,13} and 2) the NaOH scrubber achieves about 95 percent reduction (NaOH Scrubber Information)⁴², which is not quite enough to meet the proposed chromium emission limit. The cost of the control equipment to wool fiberglass plants is about \$225,000 for installation and annual operation and maintenance costs of about \$5000 per year. We compared the cost of the controls to the sales or revenues of the companies that would incur costs to comply with the chromium emission limits. The economic impact on these firms, measured in annual compliance costs as a percent of sales or revenues, is less than 0.001 percent for each of the affected firms.⁴³

⁴³ Economic Impact and Initial Regulatory Flexibility Analysis. September 2011

We therefore, we propose that requiring the 0.06 lb chromium per thousand tons of melt limit in the NESHAP is both feasible and cost effective. We solicit comment on this comparison and the use of this value as a reasonable cost to reduce chromium.

Table 12. Proposed Emissions limits for Glass-Melting Furnaces based on Technology Review

Pollutant	Pounds pollutant per ton of melt
PM	0.14
Chromium Compounds	0.00006

This proposed limit for chromium compounds (of 0.06 lb per thousand tons chromium limit) under CAA Section 112(d)(6) is the same limit being proposed under Section 112(f)(2) that was described earlier in this notice. We believe that these proposed revisions for chromium and PM are cost effective revisions and reflect the current developments in processes and technology by this industry. (i.e., well performing air pollution control).

IX. Summary of Cost, Environmental, and Economic Impacts for the Mineral Wool Source Category

Here we discuss the anticipated air, water, solid waste and energy impacts in addition to the cost and economic impacts to the industry as a result of the proposed amendments to the 1999 MACT rule.

A. What are the affected sources in the Mineral Wool Production source category?

We anticipate that the 7 mineral wool production facilities currently operating in the United States will be affected by these proposed amendments.

B. How are the impacts for this proposal evaluated?

For the proposed amendments to the Mineral Wool Production source category, the air quality, water quality, solid waste, and energy impacts were determined based on the need for additional control technologies and actions required to meet the proposed emissions limits. The Economic Impact Analysis considered annual sales and revenue data from the facilities within this source category and their ability to meet the proposed amendments. The following sections discuss the cost, environmental, and economic impacts to the Mineral Wool Production source category. (Economic Impact Analysis for the Mineral Wool and Wool Fiberglass RTRs. US EPA. October 2011.)

C. What are the air quality impacts for the Mineral Wool Production source category?

The EPA estimated the emissions reductions that are expected to result from the proposed amendments to the 1999 MACT rule compared to the 2010 baseline emissions estimates. A detailed documentation of the analysis can be found in: Cost

Impacts of the Revised NESHAP for the Mineral Wool Production Manufacturing Source Category.

Emissions of formaldehyde from mineral wool production facilities have declined over the last 12 years as a result of federal rules, state rules and on the industry's own initiative. The current proposal would not reduce formaldehyde, phenol, or methanol emissions from their current levels. Under the proposed emissions limits for cupolas, COS, HF, and HCl emissions would be reduced by a combined 23 percent compared to 2010 levels reported in the industry survey responses. We estimated that the COS emissions reductions would be 41 tpy from cupolas.

Based on the emissions data available to the EPA, we believe that all facilities will be able to comply with the proposed emissions limits for COS, HF, HCl, formaldehyde, phenol, and methanol without additional controls because they can reduce emissions using raw material substitution or oxygen injection as discussed previously in **Section VII.F** of this preamble.

D. What are the water quality and solid waste impacts?

We do not anticipate any adverse water quality or solid waste impacts from the proposed amendments to the 1999 MACT rule because the requirements proposed would not change the existing requirements that impact water quality or solid waste.

E. What are the secondary impacts?

Indirect or secondary air quality impacts include impacts that will 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 might occur as a result of these proposed actions. We anticipate that the mineral wool production facilities will be able to comply with the proposed amendments without having to install additional control technologies such as RTOs. In addition, those facilities that switch to low-sulfur raw materials will most likely reduce air emissions of SO₂.

F. What are the energy impacts?

Energy impacts in this section are those energy requirements associated with the operation of emission control devices. Potential impacts on the national energy economy from the rule are discussed in the economic impacts section. There would be little national energy demand increase from the operation of any of the control options analyzed under the proposed NESHAP amendments.

G. What are the cost impacts for the Mineral Wool Production source category?

Each facility was evaluated for its ability to meet the proposed emissions limits for PM, COS, HF, and HCl emissions from cupolas and formaldehyde, phenol, and methanol emissions from combined collection operations and curing designs. The

memorandum, Cost Impacts of the Revised NESHAP for the Mineral Wool Production Manufacturing Source Category, includes a complete description of the cost estimate methods used for this analysis and is available in the docket.

We identified several ways in which mineral wool producers reduce the COS emissions from cupolas, enabling them to comply with the proposed emission limit of 3.3 lb COS per ton of melt. These methods include raw material substitution, oxygen injection, and installation of an RTO. We found two approaches to raw material substitution: slag and rock. One mineral wool manufacturer purchases low-sulfur slag, a waste product from a local steel plant. Another plant owns and operates a local quarry from which they obtain rock that does not contain sulfur. The low-sulfur slag or rock is used in the cupola in place of high-sulfur slag. Because sulfur is not added into the cupola with the raw materials, it is not emitted as sulfur compounds from the stack in the form of COS or SO₂ during production. As shown in their title V permit, another plant uses oxygen injection to accelerate the reaction of COS to CO₂ and SO₂, thereby reducing that company's COS emissions.

However, most mineral wool plants have installed regenerative thermal oxidizers to convert the high concentrations of COS in the cupola exhaust gas to energy that is returned to the cupola. This technology reduces the

consumption of coke up to 30 percent and, because of the cost of coke, this technology pays for itself over a period of several years. Emissions of COS are below 0.04 lb COS per ton melt when an RTO is installed for energy reclamation and new source MACT is based upon the use of this technology.

One facility is expected to incur an incremental annualized cost of \$360,000 for low-sulfur raw materials (rock) if they use that option to comply with the COS requirement for cupolas. That cost would be lessened to no more than \$20,000 for installation of oxygen injection, which is another alternative. We do not anticipate this plant would install an RTO to comply with the rule. The total industry-wide costs for monitoring for COS, HF, and HCl from the cupolas is \$146,000, while the total costs for monitoring for formaldehyde, phenol, and methanol from the combined collection and curing operations is \$42,000.

The total annualized costs for the proposed rule are estimated at \$548,000 (2010 dollars). Table 13 provides a summary of the estimated costs and emissions reductions associated with the proposed amendments to the Mineral Wool Production NESHAP presented in this action.

Table 13. Estimated Costs and Reductions for the Mineral Wool Production Proposed Standards in this Action

Proposed Amendment	Estimated Capital Cost (\$MM)	Estimated Annual Cost (\$MM)	Total HAP Emissions Reductions (tons per year)	Cost Effectiveness in \$ per ton total HAP reduction
COS limit;	0	0.360	41	8,780

Low-Sulfur Materials				
Additional testing and monitoring	0	0.243	N/A	N/A

H. What are the economic impacts for the Mineral Wool Production source category?

We performed an economic impact analysis for mineral wool producers nationally using the annual compliance costs estimated for this proposed rule. (Economic Impact and Initial Regulatory Flexibility Analysis. October 2011)⁴³. The impacts to most producers affected by this proposed rule are annualized costs of less than one percent of their revenues using the most current year available for revenue data. One producer will experience an annualized cost of 6.7 percent of its revenue, however. Both demand and supply in this sector are inelastic to price changes. Thus, if producers could pass through the entire cost of the rule to consumers, we would expect prices to increase by less than one percent, with no change in output. Conversely, if producers could not pass through any of the cost by increasing the price, we would expect output to decline by less than one percent.

Hence, the overall economic impact of this proposed rule should be low on most of the affected industry and its consumers. For more information, please refer to the Economic

Impact Analysis for this proposed rulemaking that is available in the public docket. Id.

I. What are the benefits for the Mineral Wool Production source category?

The proposed Mineral Wool Production NESHAP amendments are expected to result in approximately 23 percent reduction in COS; HF, and HCl are not reduced. We have not quantified the monetary benefits associated with these reductions.

J. What demographic groups might benefit the most from this regulation?

The worst-case nature of our acute screening assessment suggests that the potential for adverse effects carries a relatively low probability of occurrence. The EPA concludes that, based on our analyses, the risks associated with MACT-allowable and actual emissions (primarily due to formaldehyde emissions from stacks) from this source category are acceptable. Thus, a demographic analysis was not conducted.

X. Summary of Cost, Environmental, and Economic Impacts for the Wool Fiberglass Manufacturing Source Category

A. What are the affected sources in the Wool Fiberglass Manufacturing source category?

We evaluated the impacts to the affected sources based on all available information, including two significant sources: the 2010 emissions testing and subsequent conversations with

NAIMA and individuals operating industry facilities. According to the 2010 emissions test data, there are 3 furnaces at 3 facilities that do not meet this proposed chromium emission limit. In their responses to the survey conducted by the industry, facilities stated the tested furnaces were representative of the untested furnaces. However, furnace construction materials (refractory composition) were not one of the factors considered in determining representativeness.

After the completion of the survey conducted by industry, we received information that emissions testing for chromium may not necessarily be representative of other furnaces that were not tested. Therefore, we based our assessment of the impacts upon the tested furnaces only, and did not include in that assessment untested furnaces.

Based on this approach, we anticipate that all 29 wool fiberglass manufacturing facilities currently operating in the United States will be affected by these proposed amendments, 2 of the 29 wool fiberglass manufacturing facilities currently operating in the United States will install air pollution controls, and that one facility will reconstruct a furnace to comply with these proposed amendments. Additionally, industry has stated that no major wool fiberglass residential insulation sources will still exist in this source category by the time the proposed rules are promulgated. If their predictions come to

pass, we estimate that two facilities will be affected by these proposed amendments; these are pipe insulation facilities. However, any major sources still in operation at the time the amendments are promulgated will be affected by this rule. One new facility was recently built, but no facilities are expected to be constructed in the foreseeable future.

B. How are the impacts for this proposal evaluated?

For the proposed Wool Fiberglass Manufacturing NESHAP amendments, the air quality, water quality, solid waste, and energy impacts were determined based on the need for additional control technologies and actions required to meet the proposed emissions limits. The Economic Impact Analysis considered annual sales and revenue data from the facilities within this source category and their ability to meet the proposed amendments. The following sections discuss the cost, environmental, and economic impacts to the Wool Fiberglass Manufacturing source category.

(Economic Impact Analysis for the Mineral Wool and Wool Fiberglass RTRs. US EPA. October 2011.)

C. What are the air quality impacts?

The EPA estimated the emissions reductions that are expected to result from the proposed amendments to the 1999 MACT rule compared to the 2010 baseline emissions estimates. A detailed documentation of the analysis can be found in: Cost Impacts of the Revised NESHAP for the Wool Fiberglass

Manufacturing Source Category. We expect reductions of formaldehyde, phenol and methanol, and chromium compounds.

Emissions of formaldehyde, PM, and HAP metals from wool fiberglass manufacturing have declined over the last 12 years as a result of federal rules, state rules and on the industry's own initiative. The current proposal is expected to yield emission reductions for formaldehyde, phenol, and methanol from their current levels. However, the proposed amendments are expected to discourage facilities in the wool fiberglass industry from reintroducing formaldehyde to their production lines. In addition, the proposed chromium compound emission limit would prevent emissions of chromium compounds in the future and discourage the replacement of currently operating furnaces with those constructed of high chromium refractory bricks.

Based on the emissions data available to the EPA, we believe that all affected facilities will be able to comply with the proposed emissions limits for formaldehyde, phenol, methanol, HF, and HCl without additional controls. Additional controls are required for major sources with high-chrome refractories. Additionally, as discussed in **Section X.J** of this preamble, the EPA has determined that the proposed rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations.

D. What are the water quality and solid waste impacts?

We anticipate water quality and solid waste impacts may result from the disposal of high chrome refractories in landfills or in other areas that are not designed or permitted to receive hexavalent chromium waste. Water quality and solid waste impacts are also possible from potential reuse of spent high chrome refractory products. Because of their durability, we believe that use of refractory bricks made with high chrome content are becoming widespread⁴⁴, (Chromium in Refractories)¹¹, as their use can nearly double the life of glass furnaces (Notes of April 14, 2011, Certainteed; Region 7 Certainteed Notes; August 31, 2011 Meeting)^{12,13,35}. When glass furnaces reach the end of their useful life and must be rebuilt, the high chrome refractory brick from demolition of the old furnace is typically discarded, as it typically cannot be used in new furnace construction. As for any industrial waste, the bricks from an old glass furnace would, when discarded, potentially be subject to the Resource Conservation and Recovery Act (RCRA) and its regulations.

Additionally, NaOH scrubber solids are expected to contain high levels of hexavalent chromium removed from furnace emissions. The proper disposal procedures for hexavalent

⁴⁴ Excel spreadsheet provided by North American Insulation Manufacturers Association (NAIMA). Non-CBI NAIMA Response to Cr Emissions 8.11.11.

chromium-contaminated waste are provided under RCRA regulations (40 CFR 262.11).

E. What are the secondary impacts?

Indirect or secondary air quality impacts include impacts that will result from the increased electricity usage associated with the operation of control devices, as well as water quality and solid waste impacts that might occur as a result of these proposed actions. We estimate the proposed amendments will not result in any significant secondary impacts from the requirements of the Mineral Wool MACT amendments because facilities can meet the COS limits without installing RTOs. We do not anticipate significant secondary impacts from the proposed amendments to the Wool Fiberglass MACT.

F. What are the energy impacts?

Energy impacts in this section are those energy requirements associated with the operation of emission control devices. Potential impacts on the national energy economy from the proposed amendments to the Wool Fiberglass MACT are expected to be minimal and will not result in a significant increase in national energy demand.

G. What are the cost impacts?

The capital costs for each facility were estimated based on the ability for each facility to meet the proposed emissions limits for PM, chromium compounds, HF, HCl, formaldehyde,

phenol, and methanol. The memorandum, Cost Impacts of the Revised NESHAP for the Wool Fiberglass Manufacturing Source Category, includes a complete description of the cost estimate methods used for this analysis and is available in the docket. Under the proposed amendments, the majority of wool fiberglass facilities are not expected to incur any capital costs to comply with the proposed emissions limits. The total costs estimated for compliance with the amendments proposed in this action are \$60,000 for compliance testing on glass-melting furnaces and \$52,000 for compliance testing on the FA manufacturing line for pipe insulation products. The total annualized costs for the proposed rule are estimated at \$112,000 (2010 dollars). Table 14 provides a summary of the costs and emission reductions associated with the proposed amendments if the three facilities with high levels of hexavalent chromium install controls or reconstruct furnaces to meet the emission limits of the proposed rule. Because the industry is undergoing the phaseout of HAP binders, no major sources are expected to exist by the compliance deadline for this proposed rule, and no costs to industry beyond testing would be incurred. However, in the event that the three facilities that do not now meet the chromium compounds limit were to remain major sources, we estimated the annualized control costs as between \$100,000 to \$300,000 per furnace, depending on which of two options is used. Nine hundred

seventy (970) pounds of chromium compounds per year would be reduced at three major sources in the industry, 913 pounds of this from a single facility. Hexavalent chromium is 92% of the total chromium compounds emitted from wool fiberglass furnaces. Actual facility costs would be determined by the number of furnaces, the associated level of Cr emissions, and the major source status of the facility.

Table 14. Estimated Costs and Reductions for the Proposed Wool Fiberglass Manufacturing Standards in this Action

Proposed Amendment	Est. Capital Cost (\$MM)	Est. Annual Cost (\$MM)	Total HAP Emissions Reductions (pounds per year)	Cost Effectiveness in \$ per pound	No. Facilities
Change out of refractory brick lining	6.0	0.3	900	333	1
Installation of NaOH scrubber	0.25	0.1	70	1400	2
Additional testing and monitoring for glass-melting furnaces	0	0.06	N/A	N/A	
Additional testing and monitoring for FA lines for pipe insulation products	0	0.052	N/A	N/A	

H. What are the economic impacts?

We performed an economic impact analysis for the wool fiberglass industry using the annual compliance costs estimated for this proposed rule (Economic Impact and Initial Regulatory Flexibility Analysis for the Proposed Mineral Wool and Wool Fiberglass Risk and Technology Review)⁴³. The impacts to producers affected by this proposed rule are annualized costs of less than 0.1 percent of their revenues using the most current year available for revenue data. With the responsiveness of wool fiberglass demand and supply at less than 1:1 compared to a price change, and with the change in product price as approximated by the cost to revenue ratio at less than 0.1 percent, for this ratio is the maximum price change that producers may face, it is expected that wool fiberglass price and output changes will be less than 0.1 percent. Hence, the overall economic impact of this proposed rule should be low on the affected industry and its consumers. For more information, please refer to the Economic Impact Analysis for this proposed rulemaking that is available in the public docket. (Economic Impact Analysis for the Mineral Wool and Wool Fiberglass RTRs. US EPA. October 2011.)

I. What are the benefits?

As stated in section X.C., we expect emissions reductions of PM, phenol, formaldehyde, methanol, and chromium compounds. We have

not quantified the monetary benefits associated with these reductions.

J. What demographic groups might benefit the most from this regulation?

For the proposed wool fiberglass rule, the EPA has determined that the current health risks posed to anyone by emissions from this source category are acceptable. However, there are about 849,000 people nationwide that are currently subject to health risks which are non-negligible (i.e., cancer risks greater than 1-in-1 million) due to emissions from this source category. We performed an analysis of the demographic makeup of these 849,000 people. The demographic distribution of this "at-risk" population is similar to the national distribution of demographics for all groups except for the "minority" group (defined as total population minus the white population), which is 11 percent greater than its corresponding national percentage. See the Risk and Technology Review - Analysis of Socio-Economic Factors for Populations Living Near Wool Fiberglass Facilities in the docket for additional details on the demographic analysis.

The EPA has determined that the current health risks posed to anyone by emissions from this source category are acceptable. Therefore, the EPA has determined that the proposed rule will

not have disproportionately high and adverse human health or environmental effects on minority or low-income populations.

XI. Request for Comments

We are soliciting comments on all aspects of this proposed action. All comments received during the comment period will be considered. In addition to general comments on this proposed action, we are also interested in any additional data that may help to address emissions of chromium compounds from wool fiberglass manufacturing furnaces, such as speciation of the different types of chromium compounds that may be used in the manufacture of refractory bricks, shapes, and castables; and the properties of different chromium compounds when exposed to temperatures exceeding 1500°C. Specifically, we are interested in data we can use to support any of the proposed alternatives and new data that could support an alternative not proposed in these actions. We are also interested in additional data that may help to reduce the uncertainties inherent in the risk assessments and other analyses. We are specifically interested in receiving corrections to the site-specific emissions profiles used for risk modeling. Such data should include supporting documentation in sufficient detail to allow characterization of the quality and representativeness of the data or information. **Section VII** of this preamble provides more information on submitting data.

XII. Submitting Data Corrections

The site-specific emissions profiles used in the source category risk and demographic analyses are available for download on the RTR web page at:

<http://www.epa.gov/ttn/atw/rrisk/rtrpg.html>. The data files include detailed information for each HAP emissions release point for the facility included in the source category.

If you believe that the data are not representative or are inaccurate, please identify the data in question, provide your reason for concern, and provide any "improved" data that you have, if available. When you submit data, we request that you provide documentation of the basis for the revised values to support your suggested changes. To submit comments on the data downloaded from the RTR Web page, complete the following steps:

1. Within this downloaded file, enter suggested revisions to the data fields appropriate for that information. The data fields that may be revised include the following:

Data Element	Definition
Control Measure	Are control measures in place? (yes or no)
Control Measure Comment	Select control measure from list provided, and briefly describe the control measure
Delete	Indicate here if the facility or record should be deleted
Delete Comment	Describes the reason for deletion
Emissions Calculation Method Code For Revised Emissions	Code description of the method used to derive emissions. For example, CEM, material balance, stack test, etc.
Emissions Process Group	Enter the general type of emissions process associated with the specified emissions point

Data Element	Definition
Fugitive Angle	Enter release angle (clockwise from true North); orientation of the y-dimension relative to true North, measured positive for clockwise starting at 0 degrees (maximum 89 degrees)
Fugitive Length	Enter dimension of the source in the east-west (x-) direction, commonly referred to as length (ft)
Fugitive Width	Enter dimension of the source in the north-south (y-) direction, commonly referred to as width (ft)
Malfunction Emissions	Enter total annual emissions due to malfunctions (tpy)
Malfunction Emissions Max Hourly	Enter maximum hourly malfunction emissions here (lb/hr)
North American Datum	Enter datum for latitude/longitude coordinates (NAD27 or NAD83); if left blank, NAD83 is assumed
Process Comment	Enter general comments about process sources of emissions
REVISED Address	Enter revised physical street address for MACT facility here
REVISED City	Enter revised city name here
REVISED County Name	Enter revised county name here
REVISED Emissions Release Point Type	Enter revised Emissions Release Point Type here
REVISED End Date	Enter revised End Date here
REVISED Exit Gas Flow Rate	Enter revised Exit Gas Flowrate here (ft ³ /sec)
REVISED Exit Gas Temperature	Enter revised Exit Gas Temperature here (F)
REVISED Exit Gas Velocity	Enter revised Exit Gas Velocity here (ft/sec)
REVISED Facility Category Code	Enter revised Facility Category Code here, which indicates whether facility is a major or area source
REVISED Facility Name	Enter revised Facility Name here
REVISED Facility Registry Identifier	Enter revised Facility Registry Identifier here, which is an ID assigned by the EPA Facility Registry System
REVISED HAP Emissions Performance Level Code	Enter revised HAP Emissions Performance Level here

Data Element	Definition
REVISED Latitude	Enter revised Latitude here (decimal degrees)
REVISED Longitude	Enter revised Longitude here (decimal degrees)
REVISED MACT Code	Enter revised MACT Code here
REVISED Pollutant Code	Enter revised Pollutant Code here
REVISED Routine Emissions	Enter revised routine emissions value here (tpy)
REVISED SCC Code	Enter revised SCC Code here
REVISED Stack Diameter	Enter revised Stack Diameter here (ft)
REVISED Stack Height	Enter revised Stack Height here (ft)
REVISED Start Date	Enter revised Start Date here
REVISED State	Enter revised State here
REVISED Tribal Code	Enter revised Tribal Code here
REVISED Zip Code	Enter revised Zip Code here
Shutdown Emissions	Enter total annual emissions due to shutdown events (tpy)
Shutdown Emissions Max Hourly	Enter maximum hourly shutdown emissions here (lb/hr)
Stack Comment	Enter general comments about emissions release points
Startup Emissions	Enter total annual emissions due to startup events (tpy)
Startup Emissions Max Hourly	Enter maximum hourly startup emissions here (lb/hr)
Year Closed	Enter date facility stopped operations

2. Fill in the commenter information fields for each suggested revision (i.e., commenter name, commenter organization, commenter email address, commenter phone number, and revision comments).

3. Gather documentation for any suggested emissions revisions (e.g., performance test reports, material balance calculations).

4. Send the entire downloaded file with suggested revisions in Microsoft® Access format and all accompanying documentation

to Docket ID Number EPA-HQ-OAR-2010-1041 for the Mineral Wool Production source category and Docket ID number EPA-HQ-OAR-2010-1042 for the Wool Fiberglass Manufacturing source category (through one of the methods described in the ADDRESSES section of this preamble). To expedite review of the revisions, it would also be helpful if you submitted a copy of your revisions to the EPA directly at RTR@epa.gov in addition to submitting them to the docket.

5. If you are providing comments on a facility, you need only submit one file for that facility, which should contain all suggested changes for all sources at that facility. We request that all data revision comments be submitted in the form of updated Microsoft® Access files, which are provided on the RTR Web Page at: <http://www.epa.gov/ttn/atw/rrisk/rtrpg.html>.

XIII. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

Under Executive Order 12866 (58 FR 51735, October 4, 1993), this action is a significant regulatory action because it raises novel legal and policy issues. Accordingly, the EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011) 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 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) documents prepared by the EPA have been assigned EPA ICR numbers 1799.06 for Mineral Wool Production and 1160.10 for Wool Fiberglass Manufacturing. The information collection requirements are not enforceable until OMB approves them. The information requirements are based on notification, recordkeeping, and reporting requirements in the NESHAP General Provisions (40 CFR part 63, subpart A), which are mandatory for all operators subject to national emissions standards. These recordkeeping and reporting requirements are specifically authorized by CAA section 114 (42 U.S.C. 7414). All information submitted to the EPA pursuant to the recordkeeping and reporting requirements for which a claim of confidentiality is made is safeguarded according to agency policies set forth in 40 CFR part 2, subpart B.

For this proposed rule, the EPA is adding affirmative defense to the estimate of burden in the ICRs. To provide the public with an estimate of the relative magnitude of the burden associated with an assertion of the affirmative defense position

adopted by a source, the EPA has provided administrative adjustments to these ICRs to show what the notification, recordkeeping and reporting requirements associated with the assertion of the affirmative defense might entail. The EPA's estimate for the required notification, reports and records for any individual incident totals \$3,141 and is based on the time and effort required of a source to review relevant data, interview plant employees, and document the events surrounding a malfunction that has caused an exceedance of an emissions limit. The estimate also includes time to produce and retain the record and reports for submission to the EPA. The EPA provides this illustrative estimate of this burden because these costs are only incurred if there has been a violation and a source chooses to take advantage of the affirmative defense.

Given the variety of circumstances under which malfunctions could occur, as well as differences among sources' operation and maintenance practices, we cannot reliably predict the severity and frequency of malfunction-related excess emissions events for a particular source. It is important to note that the EPA has no basis currently for estimating the number of malfunctions that would qualify for an affirmative defense. Current historical records would be an inappropriate basis, as source owners or operators previously operated their facilities in recognition that they were exempt from the requirement to comply with

emissions standards during malfunctions. Of the number of excess emissions events reported by source operators, only a small number would be expected to result from a malfunction (based on the definition above), and only a subset of excess emissions caused by malfunctions would result in the source choosing to assert the affirmative defense. Thus, we believe the number of instances in which source operators might be expected to avail themselves of the affirmative defense will be extremely small. For this reason, we did not estimate any such occurrences for all sources subject to subparts DDD and NNN over the 3-year period covered by these ICRs. We expect to gather information on such events in the future and will revise this estimate as better information becomes available.

We estimate 7 regulated entities are currently subject to subpart DDD and will be subject to all proposed standards. The annual monitoring, reporting, and recordkeeping burden for this collection (averaged over the first 3 years after the effective date of the standards) for these amendments to subpart DDD (Mineral Wool Production) is estimated to be \$85,348 per year. This estimate includes performance tests, notifications, reporting, and recordkeeping associated with the new requirements for COS, HF, and HCl from cupolas and formaldehyde, phenol, and methanol from combined collection and curing oven designs. The total burden for the Federal government (averaged

over the first 3 years after the effective date of the standard) is estimated to be 22 hours per year at a total labor cost of \$970 per year. Burden is defined at 5 CFR 1320.3(b).

We estimate 29 regulated entities are currently subject to subpart NNN and only 2 will be subject to all proposed standards. The annual monitoring, reporting, and recordkeeping burden for this collection (averaged over the first 3 years after the effective date of the standards) for these amendments to subpart NNN (Wool Fiberglass Manufacturing) is estimated to be \$14,000 per year. This estimate includes performance tests, notifications, reporting, and recordkeeping associated with the new requirements for PM, chromium compounds, HF, and HCl from glass-melting furnaces and formaldehyde, phenol, and methanol from both RS and FA manufacturing lines. The total burden for the Federal government (averaged over the first 3 years after the effective date of the standard) is estimated to be 6.3 hours per year at a total labor cost of \$283 per year.

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 the EPA's regulations in 40 CFR are listed in 40 CFR part 9. When these ICRs are approved by OMB, the agency will publish a technical amendment to 40 CFR part 9 in the Federal Register to display the OMB control numbers for the approved

information collection requirements contained in the final rules.

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, the EPA has established a public docket for this rule, which includes this ICR, under Docket ID number EPA-HQ-OAR-2010-1041 for the Mineral Wool Production source category and Docket ID number EPA-HQ-OAR-2010-1042 for the Wool Fiberglass Manufacturing source category. Submit any comments related to the ICRs to the EPA and the OMB. See the ADDRESSES section at the beginning of this notice for where to submit comments to the EPA. Send comments to the 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 the EPA. Since the OMB is required to make a decision concerning the ICR between 30 and 60 days after [INSERT THE DATE OF PUBLICATION OF THIS PROPOSED RULE IN THE FEDERAL REGISTER], a comment to OMB is best assured of having its full effect if the OMB receives it by [INSERT THE DATE 30 DAYS AFTER THE DATE OF PUBLICATION IN THE FEDERAL REGISTER]. 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 RFA 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 impacts of this proposed rule on small entities, small entity is defined as: (1) a small business as defined by the SBA's regulations at 13 CFR 121.201; (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 that is independently owned and operated and is not dominant in its field. For this source category, which has the NAICS code 327993 (i.e., Mineral Wool Production and Wool Fiberglass Manufacturing), the SBA small business size standard is 500 employees according to the SBA small business standards definitions.

After considering the economic impacts of this proposed rule on small entities in the Mineral Wool Production and Wool Fiberglass Manufacturing source categories, I certify that this action will not have a significant economic impact on a

substantial number of small entities. Five of the 6 Mineral Wool Production parent companies affected are considered to be small entities per the definition provided in this section. However, we estimate that this proposed action will not have a significant economic impact on those companies. The impact of this proposed action on these companies will be an annualized compliance cost of less than one percent of its revenues. Only one of the five small parent companies is expected to have an annualized compliance cost of greater than one percent of its revenues. All other affected parent companies are not small businesses according to the SBA small business size standard for the affected NAICS code (NAICS 327993). One Wool Fiberglass Manufacturing facility is considered to be owned by a small business, but this facility will not experience an impact from this proposed rule. We have determined that the impacts do not constitute a significant economic impact on a substantial number of small entities in the Wool Fiberglass Manufacturing source category (See: Economic Impact and Small Business Analysis for the proposed Mineral Wool and Wood Fiberglass Production Source Categories NESHAP).

Although this proposed rule will not have a significant economic impact on a substantial number of small entities, the EPA nonetheless has tried to reduce the impact of this rule on small entities. For more information, please refer to the

economic impact and small business analysis that is in the docket. We continue to be interested in the potential impacts of the proposed rule on small entities and welcome comments on issues related to such impacts.

D. Unfunded Mandates Reform Act.

This proposed rule does not contain a Federal mandate under the provisions of Title II of the UMRA of 1995 , 2 U.S.C. 1531-1538 for State, local, or tribal governments or the private sector. The proposed rule would not result in expenditures of \$100 million or more for State, local, and tribal governments, in aggregate, or the private sector in any 1 year. The proposed rule imposes no enforceable duties on any State, local or tribal governments or the private sector. Thus, this proposed rule is not subject to the requirements of sections 202 or 205 of the UMRA.

This proposed rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments because it contains no requirements that apply to such governments nor does it impose obligations upon them.

E. Executive Order 13132: Federalism.

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 facilities subject to this action are owned or operated by State governments, and, because no new requirements are being promulgated, nothing in this proposed rule will supersede State regulations. Thus, Executive Order 13132 does not apply to this proposed rule.

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

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

This proposed rule does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). Thus, Executive Order 13175 does not apply to this action.

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

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

This proposed rule is not subject to Executive Order 13045 (62 FR 19885, April 23, 1997) because it is not economically significant as defined in Executive Order 12866.

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

This action is not a "significant energy action" as defined under 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 significant adverse effect on the supply, distribution, or use of energy. This action will not create any new requirements and therefore no additional costs for sources in the energy supply, distribution, or use sectors.

I. National Technology Transfer and Advancement Act.

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law No. 104-113 (15 U.S.C. 272 note), directs the EPA to use 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 voluntary consensus standards bodies. NTTAA directs the EPA to provide Congress, through OMB, explanations when the agency decides not to use available and applicable VCS.

The proposed rule involves technical standards. Therefore, the requirements of the NTTAA apply to this action. We conducted searches for the RTR for the Mineral Wool Production and Wool

Fiberglass Manufacturing NESHAP through the Enhanced NSSN Database managed by the American National Standards Institute (ANSI). We also contacted VCS organizations and accessed and searched their databases.

Under 40 CFR part 63 subpart DDD, searches were conducted for EPA Methods 5, 318, and 320 of 40 CFR Part 60, Appendix A. Under 40 CFR part 63 subpart NNN, searches were conducted for EPA Methods 5, 318, 320, 29, and 0061 of 40 CFR Part 60, Appendix A. No applicable voluntary consensus standards were identified for EPA Method 318 and SW-846 Method 0061.

One voluntary consensus standard ASTM D6348-03(2010), Determination of Gaseous Compounds by Extractive Direct Interface Fourier Transform (FTIR) Spectroscopy is acceptable as an alternative to Method 320 for both subparts DDD and NNN, but with several conditions: (1) The test plan preparation and implementation in the Annexes to ASTM D6348-03, Sections A1 through A8 are mandatory; and (2) In ASTM D6348-03 Annex A5 (Analyte Spiking Technique), the percent R (percent R) must be determined for each target analyte (Equation A5.5). In order for the test data to be acceptable for a compound, percent R must be 70 percent $\geq R \leq$ 130 percent. If the percent R value does not meet the 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 percent R value for each compound must be reported in the test report, and all field measurements must be corrected with the calculated percent R value for that compound by using the following equation:

Reported Result = (Measured Concentration in the Stack x 100)/percent R.

In addition, ASTM D6784-02(2008), Standard Test Method for Elemental, Oxidized, Particle-Bound and Total Mercury Gas Generated from Coal-Fired Stationary Sources (Ontario Hydro Method) is acceptable as an alternative to Method 29 in the subpart NNN rule.

The search identified four other VCS that were potentially applicable for the Mineral Wool Production rule in lieu of EPA reference methods. However, after reviewing the available standards, EPA determined that four candidate VCS (ASTM D3685/D3685M-98 [2005], ISO 9096:1992 [2003], CAN/CSA Z223.1-M1977, ANSI/ASME PTC 38 1980 [1985]) identified for measuring emissions of pollutants or their surrogates subject to emission standards in the rule would not be practical due to lack of equivalency, documentation, validation data and other important technical and policy considerations.

Under the Wool Fiberglass rule, the search identified six other VCS that were potentially applicable in lieu of EPA reference methods (EN 13211:2001, CAN/CSA Z223.26-M1986, ASTM

D3685/D3685M-98 [2005], ISO 9096:1992 [2003], CAN/CSA Z223.1-M1977, and ANSI/ASME PTC 38 1980 [1985]). However, the EPA determined that these methods would not be practical due to lack of equivalency, documentation, validation data and other important technical and policy considerations.

The VCS searches are documented in the Voluntary Consensus Standard Results for the Risk and Technology Review for the Mineral Wool NESHAP and the Voluntary Consensus Standard Results for the Risk and Technology Review for the Wool Fiberglass NESHAP memorandums as provided in the docket.

The EPA welcomes comments on this aspect of the proposed rulemaking and, specifically, invites the public to identify potentially-applicable VCS 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, February 16, 1994) establishes federal executive policy on EJ. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make EJ 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.

For the proposed mineral wool rule, the EPA has determined that the rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations, because it increases 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.

For the proposed wool fiberglass rule, the EPA has determined that the current health risks posed to anyone by emissions from this source category are acceptable. Therefore, the EPA has determined that the proposed rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations. =.

List of Subjects in 40 CFR Part 63

Environmental protection, Air pollution control,
Incorporation by reference, Mineral wool, Wool fiberglass,
Reporting and recordkeeping requirements.

Dated: November 4, 2011.

Lisa P. Jackson,
Administrator.

For the reasons stated in the preamble, part 63 of title 40, chapter I, of the Code of Federal Regulations is proposed to be amended as follows:

PART 63—[AMENDED]

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

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

Subpart DDD - [AMENDED]

2. Section 63.1178 is amended by revising paragraph (a)(2) and adding paragraphs (a)(3) and (4) to read as follows:

§ 63.1178 For cupolas, what standards must I meet?

* * * * *

(a) * * *

(2) Limit emissions of carbonyl sulfide (COS) from each existing, new, or reconstructed cupola to the following:

(i) 3.3 lb of COS per ton of melt or less for existing cupolas.

(ii) 0.017 lb of COS per ton of melt or less for new or reconstructed cupolas.

(3) Limit emissions of hydrogen fluoride (HF) from each existing, new, or reconstructed cupola to 0.014 lb of HF per ton of melt or less.

(4) Limit emissions of hydrogen chloride (HCl) from each existing, new, or reconstructed cupola to 0.0096 lb of HCl per ton of melt or less.

* * * * *

3. Section 63.1179 is amended by revising the section heading and paragraphs (a) and (b) introductory text to read as follows:

§ 63.1179 For combined collection/curing operations, what standards must I meet?

(a) You must control emissions from each existing and new combined collection/curing operations by limiting emissions of formaldehyde, phenol, and methanol to the following:

(1) For combined drum collection/curing operations:

- (i) 0.067 lb of formaldehyde per ton of melt or less,
- (ii) 0.0023 lb of phenol per ton of melt or less, and
- (iii) 0.00077 lb of methanol per ton of melt or less.

(2) For combined horizontal collection/curing operations:

- (i) 0.054 lb of formaldehyde per ton of melt or less,
- (ii) 0.15 lb of phenol per ton of melt or less, and
- (iii) 0.022 lb of methanol per ton of melt or less.

(3) For combined vertical collection/curing operations:

- (i) 0.46 lb of formaldehyde per ton of melt or less,
- (ii) 0.52 lb of phenol per ton of melt or less, and
- (iii) 0.63 lb of methanol per ton of melt or less.

(b) You must meet the following operating limits for each combined collection/curing operations subcategory:

* * * * *

4. Section 63.1180 is amended by revising paragraphs (a), (b), and (d), and adding paragraph (e) to read as follows:

§63.1180 When must I meet these standards?

(a) Existing cupolas and combined collection/curing operations. (1) Except as noted in paragraph (a)(2) of this section, the compliance date for an owner or operator of an existing plant or source subject to the provisions of this subpart is June 2, 2002 or June 3, 2003 if you applied for and received a one-year extension under section 112(i)(b)(3)(B) of the Act.

(2) The compliance dates for existing plants and sources are:

(i) [DATE 3 YEARS AFTER PUBLICATION OF THE FINAL RULE IN THE FEDERAL REGISTER] for cupolas and combined collection/curing operations subject to emission limits in §§63.1178 and 63.1179 which became effective [DATE OF PUBLICATION OF THE FINAL RULE IN THE FEDERAL REGISTER].

(ii) [DATE OF PUBLICATION OF THE FINAL RULE IN THE FEDERAL REGISTER] for the provisions related to malfunctions and affirmative defense provisions of paragraph (e) of this section

and the electronic reporting provisions of §§63.1192(d) and 63.1193(b)(1) and (g).

(b) New and reconstructed cupolas and combined collection/curing operations. For affected sources that commenced construction or reconstruction after [INSERTDATE OF PUBLICATION OF THIS PROPOSED RULE IN THE FEDERAL REGISTER], you must demonstrate compliance with the requirements of this subpart no later than the effective date of the rule or upon start-up.

* * * * *

(d) See §63.1197 for requirements during startups and shutdowns.

(e) Affirmative defense for exceedance of emissions limits during malfunction. In response to an action to enforce the standards set forth in this subpart, you may assert an affirmative defense to a claim for civil penalties for exceedances of such standards that are caused by malfunction, as defined at §63.2. Appropriate penalties may be assessed, however, if you fail to meet your burden of proving all of the requirements in the affirmative defense. The affirmative defense must not be available for claims for injunctive relief.

(1) To establish the affirmative defense in any action to enforce such a limit, you must timely meet the notification

requirements in §63.1191 of this subpart, and must prove by a preponderance of evidence that:

(i) The excess emissions:

(A) Were caused by a sudden, infrequent, and unavoidable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner; and

(B) Could not have been prevented through careful planning, proper design or better operation and maintenance practices; and

(C) Did not stem from any activity or event that could have been foreseen and avoided, or planned for; and

(D) Were not part of a recurring pattern indicative of inadequate design, operation, or maintenance.

(ii) Repairs were made as expeditiously as possible when the applicable emissions limitations were being exceeded. Off-shift and overtime labor were used, to the extent practicable to make these repairs; and

(iii) The frequency, amount and duration of the excess emissions (including any bypass) were minimized to the maximum extent practicable during periods of such emissions; and

(iv) If the excess emissions resulted from a bypass of control equipment or a process, then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and

(v) All possible steps were taken to minimize the impact of the excess emissions on ambient air quality, the environment and human health; and

(vi) All emissions monitoring and control systems were kept in operation if at all possible, consistent with safety and good air pollution control practices; and

(vii) All of the actions in response to the excess emissions were documented by properly signed, contemporaneous operating logs; and

(viii) At all times, the affected source was operated in a manner consistent with good practices for minimizing emissions; and

(ix) A written root cause analysis has been prepared, the purpose of which is to determine, correct, and eliminate the primary causes of the malfunction and the excess emissions resulting from the malfunction event at issue. The analysis must also specify, using best monitoring methods and engineering judgment, the amount of excess emissions that were the result of the malfunction.

(2) Notification. The owner or operator of the affected source experiencing an exceedance of its emissions limit(s) during a malfunction, must notify the Administrator by telephone or facsimile transmission as soon as possible, but no later than two business days after the initial occurrence of the

malfunction, s/he wishes to be able to use an affirmative defense to civil penalties for that malfunction. The owner or operator seeking to assert an affirmative defense, must also submit a written report to the Administrator within 45 days of the initial occurrence of the exceedance of the standards in this subpart. This report must demonstrate that the owner/operator met the requirements set forth in this paragraph (e) and must include all necessary supporting documentation. The owner or operator may seek an extension of this deadline for up to 30 additional days by submitting a written request to the Administrator before the expiration of the 45 day period. Until a request for an extension has been approved by the Administrator, the owner or operator is subject to the requirement to submit such report within 45 days of the initial occurrence of the exceedance.

5. Section 63.1182 is amended by revising the section heading, the introductory text, and paragraphs (a) and (b) to read as follows:

§ 63.1182 How do I comply with the carbonyl sulfide, hydrogen fluoride, and hydrogen chloride standards for existing, new, and reconstructed cupolas?

To comply with the COS, HF, and HCL standards, you must meet the following:

(a) Install, calibrate, maintain, and operate a device that continuously measures the operating temperature in the firebox of each thermal incinerator. For the purposes of this rule, the term 'incinerator' means 'regenerative thermal oxidizer' (RTO).

(b) Conduct a performance test as specified in § 63.1188 of this subpart that shows compliance with the COS, HF, and HCl emissions limits while the device for measuring incinerator (regenerative thermal oxidizer) operating temperature is installed, operational, and properly calibrated. Establish the average operating temperature based on the performance test as specified in § 63.1185(a) of this subpart.

* * * * *

6. Section 63.1183 is amended by revising the section heading, the introductory text, and paragraphs (b) and (d) to read as follows:

§ 63.1183 How do I comply with the formaldehyde, phenol, and methanol standards for existing, new, and reconstructed combined collection/curing operations?

To comply with the formaldehyde, phenol, and methanol standards, you must meet all of the following:

* * * * *

(b) Conduct a performance test as specified in § 63.1188 of this subpart while manufacturing the product that requires a binder formulation made with the resin containing the highest free-formaldehyde content specification range. Show compliance with the formaldehyde, phenol, and methanol emissions limits while the device for measuring the control device operating parameter is installed, operational, and properly calibrated. Establish the average operating parameter based on the performance test as specified in § 63.1185(a) of this subpart.

* * * * *

(d) Following the performance test, monitor and record the free-formaldehyde content of each resin lot and the formulation of each batch of binder used, including the formaldehyde, phenol, and methanol content.

* * * * *

7. Section 63.1188 is amended by revising paragraphs (b), (c), (d), (e), and (f) to read as follows:

§ 63.1188 What performance test requirements must I meet?

* * * * *

(b) Conduct a performance test, consisting of three test runs, for each cupola and/or combined collection/curing operation subject to this subpart at the maximum production rate to demonstrate compliance with each of the applicable emissions limits in §§ 63.1178 and 63.1179 of this subpart.

(c) Following the initial performance or compliance test to be conducted within 120 days of the effective date of this rule, you must conduct a performance test to demonstrate compliance with each of the applicable emissions limits in §§ 63.1178 and 63.1179 of this subpart at least once every 5 years and as often as the raw material ingredients change by more than 10 percent of those processed during the previous performance test.

(d) Measure emissions of PM, COS, HF, and HCl from each existing, new, or reconstructed cupola.

(e) Measure emissions of formaldehyde, phenol, and methanol from each existing, new, or reconstructed combined collection/curing operation.

(f) Measure emissions at the outlet of the control device for PM, COS, HF, HCl, formaldehyde, phenol, or methanol.

* * * * *

8. Section 63.1189 is amended by revising paragraph (g) and adding paragraph (i) to read as follows:

§ 63.1189 What test methods do I use?

* * * * *

(g) Method 318 in appendix A to this part for the concentration of formaldehyde, phenol, methanol, or COS.

* * * * *

(i) Method 26A or 320 in appendix A to this part for the concentration of HF and HCl.

9. Section 63.1190 is amended by revising paragraph (b) introductory text and the "MW" entry under "where:" and by removing paragraph (c).

The revision reads as follows:

§ 63.1190 How do I determine compliance?

* * * * *

(b) Using the results from the performance tests, you must use the following equation to determine compliance with the COS, HF, HCl, formaldehyde, phenol, and methanol numerical emissions limits:

* * * * *

MW = Molecular weight of measured pollutant, g/g-mole:

COS = 60.07, HF = 20.01, HCl = 36.46, Formaldehyde = 30.03,
Phenol = 94.11, Methanol = 32.04.

* * * * *

10. Section 63.1191 is amended by revising the introductory text to read as follows:

§ 63.1191 What notifications must I submit?

You must submit written or electronic notifications to the Administrator as required by § 63.9(b) through (h) of the general provisions in subpart A of this part. Electronic

notifications are encouraged when possible. These notifications include, but are not limited to, the following:

* * * * *

11. Section 63.1192 is amended by revising paragraph (d) to read as follows:

§ 63.1192 What recordkeeping requirements must I meet?

* * * * *

(d) Records must be maintained in a form suitable and readily available for expeditious review, according to §63.10 of the General Provisions that are referenced in Table 3 to this subpart. Electronic recordkeeping is encouraged.

* * * * *

12. Section 63.1193 is amended by redesignating paragraphs (b) through (f) as paragraphs (c) through (g), and adding a new paragraph (b) and by revising the newly redesignated paragraph (g) to read as follows:

* * * * *

(b) (1) As of January 1, 2012, and within 60 days after the date of completing each performance test, as defined in § 63.2, and as required in this subpart, you must submit performance test data, except opacity data, electronically to the EPA's Central Data Exchange by using the ERT (see <http://www.epa.gov/ttn/chief/ert/erttool.html/>) or other compatible electronic spreadsheet. Only data collected using

test methods compatible with the ERT are subject to this requirement to be submitted electronically into the EPA's WebFIRE database.

* * * * *

(g) All reports required by this subpart not subject to the requirements in paragraph (b) of this section must be sent to the Administrator at the appropriate address listed in § 63.13. If acceptable to both the Administrator and the owner or operator of a source, these reports may be submitted on electronic media. The Administrator retains the right to require submittal of reports subject to paragraph (b) of this section in paper format.

13. Section 63.1196 is amended by removing the definitions for "CO" and "formaldehyde", adding definitions for "affirmative defense" and "combined collection/curing operations", and revising the definition for "incinerator" to read as follows:

§ 63.1196 What definitions should I be aware of?

* * * * *

Affirmative defense means, in the context of an enforcement proceeding, a response or defense put forward by a defendant, regarding which the defendant has the burden of proof, and the merits of which are independently and objectively evaluated in a judicial or administrative proceeding.

Combined collection/curing operations means the combination of fiber collection operations and curing ovens used to make bonded products.

Incinerator means an enclosed air pollution control device that uses controlled flame combustion to convert combustible materials to noncombustible gases. For the purposes of this rule, the term 'incinerator' means 'regenerative thermal oxidizer' (RTO).

* * * * *

14. Add § 63.1197 to read as follows:

§ 63.1197 Startups and shutdowns.

(a) The provisions set forth in this subpart apply at all times.

(b) The owner or operator must not shut down items of equipment that are utilized for compliance with this subpart.

(c) Table 1 to subpart DDD summarizes the emissions limits during startups and shutdowns for existing, new, and reconstructed cupolas.

Table 1 to Subpart DDD-Emissions limits During Startups and Shutdowns for Existing, New, and Reconstructed Cupolas, pound of pollutant per hour

Pollutant	Emission Limit (lb/hr)	
	Existing Cupolas	New and Reconstructed Cupolas
PM	1.0	1.0
COS	32	0.17
HF	0.13	0.13
HCl	0.092	0.092

(d) Table 2 to subpart DDD summarizes the emissions limits during startups and shutdowns for existing, new, and reconstructed combined collection/curing operations.

Table 2 to Subpart DDD-Emissions limits During Startups and Shutdowns for Existing, New, and Reconstructed Combined Collection/Curing Operations, pound of pollutant per hour

Design	Pollutant	Emission Limit (lb/hr)
Vertical	Formaldehyde	4.5
	Phenol	5.0
	Methanol	6.0
Horizontal	Formaldehyde	0.52
	Phenol	1.4
	Methanol	0.21
Drum	Formaldehyde	0.64
	Phenol	0.022
	Methanol	0.0074

15. Table 1 to subpart DDD of part 63 is redesignated as Table 3 to subpart DDD of part 63 and revised to read as follows:

Table 3 to Subpart DDD of Part 63—Applicability of General Provisions (40 CFR Part 63, Subpart A) to Subpart DDD of Part 63

Reference	Applies to subpart DDD	Comment
63.1	Yes	
63.2	Yes	
63.3	Yes	
63.4	Yes	
63.5	Yes	
63.6 (a), (b), (c)	Yes	
63.6 (d)	No	Section reserved.
63.6 (e) (1) (i)	No	See 63.1180 for general duty requirement.
63.6 (e) (1) (ii)	No	
63.6 (e) (1) (iii)	Yes	

Reference	Applies to subpart DDD	Comment
63.6 (e) (2)	No	Section reserved.
63.6 (e) (3)	No	
63.6 (f) (1)	No	
63.6 (g)	Yes	
63.6 (h)	No	No opacity limits in rule.
63.6 (i)	Yes	
63.6 (j)	Yes	
§63.7 (a) - (d)	Yes	
§63.7 (e) (1)	No	See 63.1180
§63.7 (e) (2) - (e) (4)	Yes	
63.7 (f), (g), (h)	Yes	
63.8 (a) - (b)	Yes	
63.8 (c) (1) (i)	No	See 63.1180 for general duty requirement.
63.8 (c) (1) (ii)	Yes	
63.8 (c) (1) (iii)	No	
63.8 (c) (2) - (d) (2)	Yes	
63.8 (d) (3)	Yes, except for last sentence	
63.8 (e) - (g)	Yes	
63.9 (a), (b), (c), (e), (g), (h) (1) through (3), (h) (5) and (6), (i) and (j)	Yes	
63.9 (f)	No	
63.9 (h) (4)	No	Reserved
63.10 (a)	Yes	
63.10 (b) (1)	Yes	
63.10 (b) (2) (i)	No	
63.10 (b) (2) (ii)	No	See 63.1193 (c) for recordkeeping of occurrence and duration of malfunctions and recordkeeping of actions taken during malfunction.
63.10 (b) (2) (iii)	Yes	
63.10 (b) (2) (iv) - (b) (2) (v)	No	

Reference	Applies to subpart DDD	Comment
63.10 (b) (2) (vi) - (b) (2) (xiv)	Yes	
63. (10) (b) (3)	Yes	
63.10 (c) (1) - (9)	Yes	
63.10 (c) (10) - (11)	No	See 63.1192 for recordkeeping of malfunctions.
63.10 (c) (12) - (c) (14)	Yes	
63.10 (c) (15)	No	
63.10 (d) (1) - (4)	Yes	
63.10 (d) (5)	No	See 63.1193 for reporting of malfunctions.
63.10 (e) - (f)	Yes	
63.11	No	Flares will not be used to comply with the emissions limits
63.12 to 63.15	Yes	

Subpart NNN - [AMENDED]

16. Section 63.1381 is amended by adding a definition for "affirmative defense" and revising the definition for "incinerator".

§ 63.1381 Definitions.

* * * * *

Affirmative defense means, in the context of an enforcement proceeding, a response or defense put forward by a defendant, regarding which the defendant has the burden of proof, and the merits of which are independently and objectively evaluated in a judicial or administrative proceeding.

Incinerator means an enclosed air pollution control device that uses controlled flame combustion to convert combustible materials to noncombustible gases. For the purposes of this rule, the term 'incinerator' means 'regenerative thermal oxidizer' (RTO).

* * * * *

17. Section 63.1382 is amended by revising paragraphs (a) and (b) (6) to read as follows:

§ 63.1382 Emission standards.

(a) Emissions limits. (1) Glass-melting furnaces. On and after the date the initial performance test is completed or required to be completed under §63.7 of this part, whichever date is earlier,

(i) The owner or operator of each existing glass-melting furnace must not discharge or cause to be discharged into the atmosphere in excess of:

(A) 0.014 pound (lb) of particulate matter (PM) per ton of glass pulled;

(B) 0.0020 lb of hydrogen fluoride (HF) per ton of glass pulled; and

(C) 0.0015 lb of hydrogen chloride (HCl) per ton of glass pulled.

(D) 0.00006 lb of chromium (Cr) compounds per ton of glass pulled (60 lb per million tons glass pulled).

(ii) The owner or operator of each new or reconstructed glass-melting furnace must not discharge or cause to be discharged into the atmosphere in excess of:

(A) 0.0018 lb of PM per ton of glass pulled;

(B) 0.00078 lb of HF per ton of glass pulled; and

(C) 0.00078 lb of HCl per ton of glass pulled.

(D) 0.00006 lb of Cr compounds per ton of glass pulled (60 lb per million tons glass pulled).

(2) Rotary spin manufacturing lines. On and after the date the initial performance test is completed or required to be completed under §63.7 of this part, whichever date is earlier,

(i) The owner or operator of each existing rotary spin (RS) manufacturing line must not discharge or cause to be discharged into the atmosphere in excess of:

- (A) 0.17 lb of formaldehyde per ton of glass pulled;
- (B) 0.19 lb of phenol per ton of glass pulled; and
- (C) 0.48 lb of methanol per ton of glass pulled.

(ii) The owner or operator of each new or reconstructed RS manufacturing line must not discharge or cause to be discharged into the atmosphere in excess of:

- (A) 0.020 lb of formaldehyde per ton of glass pulled;
- (B) 0.0011 lb of phenol per ton of glass pulled; and
- (C) 0.00067 lb of methanol per ton of glass pulled.

(3) Flame attenuation manufacturing lines. On and after the date the initial performance test is completed or required to be completed under §63.7 of this part, whichever date is earlier,

(i) The owner or operator of each existing flame attenuation (FA) manufacturing line that produces heavy-density wool fiberglass and/or pipe insulation must not discharge or cause to be discharged into the atmosphere in excess of:

- (A) 5.6 lb of formaldehyde per ton of glass pulled;
- (B) 1.4 lb of phenol per ton of glass pulled; and

(C) 0.50 lb of methanol per ton of glass pulled.

(ii) The owner or operator of each new or reconstructed FA manufacturing line that produces heavy-density wool fiberglass and/or pipe insulation must not discharge or cause to be discharged into the atmosphere in excess of:

(A) 3.3 lb of formaldehyde per ton of glass pulled;

(B) 0.46 lb of phenol per ton of glass pulled; and

(C) 0.50 lb of methanol per ton of glass pulled.

(b) * * *

(6) The owner or operator must operate each control device used to control formaldehyde, phenol, and methanol emissions from forming or curing such that any three-hour block average temperature in the firebox does not fall below the average established during the performance test as specified in §63.1384.

* * * * *

18. Section 63.1383 is amended by revising paragraph (f) to read as follows:

§ 63.1383 Monitoring requirements.

* * * * *

(f) The owner or operator who uses a control device to control HAP emissions from a glass-melting furnace, RS manufacturing line, or FA manufacturing line must install,

calibrate, maintain, and operate a monitoring device that continuously measures an appropriate parameter that is correlated to the emission limit performance test.

* * * * *

19. Section 63.1384 is amended by revising paragraph (c) introductory text, variables E, C, and MW, and adding paragraphs (d) and (e) to read as follows:

§ 63.1384 Performance test requirements.

* * * * *

(c) To determine compliance with the emission limit for formaldehyde, phenol, or methanol for RS manufacturing lines and FA manufacturing lines, and for chromium compounds, HF, or HCl for glass-melting furnaces, use the following equation:

* * * * *

E = Emission rate of formaldehyde, phenol, methanol, chromium compounds, HF, or HCl, kg/Mg (lb/ton) of glass pulled;

C = Measured volume fraction of formaldehyde, phenol, methanol, chromium compounds, HF, or HCl, ppm;

MW = Molecular weight of formaldehyde, 30.03 g/g-mol; molecular weight of phenol, 94.11 g/g-mol; molecular weight of methanol, 32.04 g/g-mol; molecular weight of chromium compounds tested in

g/g-mol; molecular weight of HF, 20.0064 g/g-mol; molecular weight of HCl, 36.4611 g/g-mol.

(d) Following the initial performance or compliance test to be conducted within 90 days of [EFFECTIVE DATE OF THE RULE] to demonstrate compliance with the chromium compounds emissions limit specified in § 63.1382(a)(1)(i)(D) or (a)(1)(ii)(D), you must conduct an annual performance test for chromium compounds emissions from each glass-melting furnace (no later than 12 calendar months following the previous compliance test).

(e) Following the initial performance or compliance test to demonstrate compliance with the PM, HF, HCl, formaldehyde, phenol, and methanol emissions limits specified in §63.1382, you must conduct a performance test to demonstrate compliance with each of the applicable PM, HF, HCl, formaldehyde, phenol, and methanol emissions limits in § 63.1382 of this subpart at least once every 5 years and as often as raw material inputs change by more than 10 percent following the previous test.

20. Section 63.1385 is amended by revising paragraphs (a)(5) and (6), and adding paragraphs (a)(11), and (a)(12).

§ 63.1385 Test methods and procedures.

(a) * * *

(5) Method 5 and Method 202 (40 CFR part 60, appendix A) for the concentration of total PM including condensibles. Each

run must consist of a minimum run time of 2 hours and a minimum sample volume of 60 dry standard cubic feet (dscf). The probe and filter holder heating system may be set to provide a gas temperature no greater than $177\pm 14^{\circ}\text{C}$ ($350\pm 25^{\circ}\text{F}$);

(6) Method 318 (appendix A of this subpart) for the concentration of formaldehyde, phenol, and methanol. Each run must consist of a minimum run time of 2 hours;

* * * * *

(11) Method 0061 (appendix A of this subpart) for the concentration of chromium compounds and hexavalent chromium. Each run must consist of a minimum run time of 1 hour.

(12) Method 26A or Method 320 (appendix A of this subpart) for the concentration of HF and HCl. Each run must consist of a minimum run time of 1 hour.

* * * * *

21. Section 63.1386 is amended by revising paragraphs (a)(2) through (4); revising paragraphs (d)(1)(ii) and (iii); adding paragraphs (d)(2)(x) (f) and (g).

The revisions and addition read as follows:

§ 63.1386 Notification, recordkeeping, and reporting requirements.

(a) * * *

(2) Notification that a source is subject to the standard, where the initial startup is before [INSERT DATE OF PUBLICATION OF THIS PROPOSED RULE IN THE FEDERAL REGISTER].

(3) Notification that a source is subject to the standard, where the source is new or has been reconstructed the initial startup is after [INSERT DATE OF PUBLICATION OF THIS PROPOSED RULE IN THE FEDERAL REGISTER], and for which an application for approval of construction or reconstruction is not required;

(4) Notification of intention to construct a new affected source or reconstruct an affected source; of the date construction or reconstruction commenced; of the anticipated date of startup; of the actual date of startup, where the initial startup of a new or reconstructed source occurs after [INSERT DATE OF PUBLICATION OF THIS PROPOSED RULE IN THE FEDERAL REGISTER], and for which an application for approval or construction or reconstruction is required (See §63.9(b)(4) and (5) of this part);

* * * * *

(d) * * *

(1) * * *

(ii) The owner or operator may retain records electronically, on a computer or labeled computer disks, or on paper; and

* * * * *

(iii) The owner or operator may report required information on paper or on a labeled computer disk using commonly available and EPA-compatible computer software. Electronic notifications are encouraged when possible.

* * * * *

(2) * * *

(x) You must report total chromium and hexavalent chromium emissions from glass-melting furnaces using Method 0061.

* * * * *

(f) (1) As of January 1, 2012 and within 60 days after the date of completing each performance test, as defined in § 63.2, and as required in this subpart, you must submit performance test data, except opacity data, electronically to the EPA's Central Data Exchange by using the ERT (see <http://www.epa.gov/ttn/chief/ert/erttool.html/>) or other compatible electronic spreadsheet. Only data collected using test methods compatible with ERT are subject to this requirement to be submitted electronically into the EPA's WebFIRE database.

(2) All reports required by this subpart not subject to the requirements in paragraph (f) (1) of this section must be sent to the Administrator at the appropriate address listed in § 63.13. If acceptable to both the Administrator and the owner or operator of a source, these reports may be submitted on electronic media. The Administrator retains the right to require

submittal of reports subject to paragraph (f)(1) of this section in paper format.

(g) Affirmative Defense for Exceedance of Emission Limit During Malfunction. In response to an action to enforce the standards set forth in this subpart, you may assert an affirmative defense to a claim for civil penalties for exceedances of such standards that are caused by malfunction, as defined at §63.2. Appropriate penalties may be assessed, however, if you fail to meet your burden of proving all of the requirements in the affirmative defense. The affirmative defense must not be available for claims for injunctive relief.

(1) To establish the affirmative defense in any action to enforce such a limit, you must timely meet the notification requirements in §63.1386 of this subpart, and must prove by a preponderance of evidence that:

(i) The excess emissions:

(A) Were caused by a sudden, infrequent, and unavoidable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner; and

(B) Could not have been prevented through careful planning, proper design or better operation and maintenance practices; and

(C) Did not stem from any activity or event that could have been foreseen and avoided, or planned for; and

(D) Were not part of a recurring pattern indicative of inadequate design, operation, or maintenance.

(ii) Repairs were made as expeditiously as possible when the applicable emissions limitations were being exceeded. Off-shift and overtime labor were used, to the extent practicable to make these repairs; and

(iii) The frequency, amount and duration of the excess emissions (including any bypass) were minimized to the maximum extent practicable during periods of such emissions; and

(iv) If the excess emissions resulted from a bypass of control equipment or a process, then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and

(v) All possible steps were taken to minimize the impact of the excess emissions on ambient air quality, the environment and human health; and

(vi) All emissions monitoring and control systems were kept in operation if at all possible, consistent with safety and good air pollution control practices; and

(vii) All of the actions in response to the excess emissions were documented by properly signed, contemporaneous operating logs; and

(viii) At all times, the affected source was operated in a manner consistent with good practices for minimizing emissions; and

(ix) A written root cause analysis has been prepared, the purpose of which is to determine, correct, and eliminate the primary causes of the malfunction and the excess emissions resulting from the malfunction event at issue. The analysis must also specify, using best monitoring methods and engineering judgment, the amount of excess emissions that were the result of the malfunction.

(2) Notification. The owner or operator of the affected source experiencing an exceedance of its emissions limit(s) during a malfunction, must notify the Administrator by telephone or facsimile transmission as soon as possible, but no later than two business days after the initial occurrence of the malfunction, if he/she wishes to be able to use an affirmative defense to civil penalties for that malfunction. The owner or operator seeking to assert an affirmative defense must also submit a written report to the Administrator within 45 days of the initial occurrence of the exceedance of the standards in this subpart. This report must demonstrate that the owner/operator has met the requirements set forth in paragraph (g) of this section and must include all necessary supporting documentation. The owner or operator may seek an extension of

this deadline for up to 30 additional days by submitting a written request to the Administrator before the expiration of the 45 day period. Until a request for an extension has been approved by the Administrator, the owner or operator is subject to the requirement to submit such report within 45 days of the initial occurrence of the exceedance.

* * * * *

22. Section 63.1387 is amended by revising paragraphs (a)(1) and (2) to read as follows:

§ 63.1387 Compliance dates.

(a) * * *

(1) Except as noted in paragraph (a)(2) of this section, the compliance date for an owner or operator of an existing plant or source subject to the provisions of this subpart is [DATE OF PUBLICATION OF THE FINAL RULE IN THE FEDERAL REGISTER].

(2) The compliance dates for existing plants and sources are:

(i) [DATE 1 YEAR AFTER PUBLICATION OF THE FINAL RULE IN THE FEDERAL REGISTER] for glass-melting furnaces, rotary spin manufacturing lines, or flame attenuation manufacturing lines subject to emission limits in § 63.1382(a) which became effective [DATE OF PUBLICATION OF THE FINAL RULE IN THE FEDERAL REGISTER].

(ii) [DATE OF PUBLICATION OF THE FINAL RULE IN THE FEDERAL REGISTER] for the provisions related to malfunctions and affirmative defense provisions of § 63.1386(g) and the electronic reporting provisions of § 63.1386(d) and (f).

* * * * *

23. Section 63.1388 is revised to read as follows:

§ 63.1388 Startups and shutdowns.

(a) The provisions set forth in this subpart apply at all times.

(b) The owner or operator must not shut down items of equipment that are required or utilized for compliance with the provisions of this subpart during times when emissions are being routed to such items of equipment, if the shutdown would contravene requirements of this subpart applicable to such items of equipment. This paragraph does not apply if the owner or operator must shut down the equipment to avoid damage due to a contemporaneous startup or shutdown, of the affected source or a portion thereof.

(c) Table 1 to subpart NNN summarizes the emissions limits during startups and shutdowns of glass-melting furnaces.

Table 1 to Subpart NNN-Emissions limits During Startups and Shutdowns of Glass-Melting Furnaces (lb/hr)

Pollutant	Existing Furnaces	New and Reconstructed Furnaces
PM	0.25	0.033
Chromium Compounds	0.0019	0.0019
HF	0.036	0.014

HCl	0.026	0.014
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(d) Table 2 to subpart NNN summarizes the emissions limits during startups and shutdowns of rotary spin (RS) manufacturing lines.

Table 2 to Subpart NNN-Emissions limits During Startups and Shutdowns of Rotary Spin (RS) Manufacturing Lines (lb/hr)

Pollutant	Existing RS Lines	New and Reconstructed RS Lines
Formaldehyde	3.1	0.36
Phenol	3.4	0.019
Methanol	8.8	0.012

(e) Table 3 to subpart NNN summarizes the emissions limits during startups and shutdowns of flame attenuation (FA) manufacturing lines.

Table 3 to Subpart NNN-Emissions limits During Startups and Shutdowns of Flame Attenuation (FA) Manufacturing Lines (lb/hr)

Pollutant	Existing FA Lines	New and Reconstructed FA Lines
Formaldehyde	100	60
Phenol	25	8
Methanol	9	9

24. Table 1 to Subpart NNN of Part 63 is redesignated as Table 4 to Subpart NNN of Part 63 and revised to read as follows:

Table 4 to Subpart NNN of Part 63—General Provisions Applicability to Subpart NNN

Reference	Applies to subpart NNN	Comment
63.1	Yes	
63.2	Yes	
63.3	Yes	
63.4	Yes	

Reference	Applies to subpart NNN	Comment
63.5	Yes	
63.6 (a), (b), (c)	Yes	
63.6 (d)	No	Section reserved.
63.6 (e) (1) (i)	No	See 63.1382(b) for general duty requirement.
63.6 (e) (1) (ii)	No	
63.6 (e) (1) (iii)	Yes	
63.6 (e) (2)	No	Section reserved.
63.6 (e) (3)	No	
63.6 (f) (1)	No	
63.6 (g)	Yes	
63.6 (h)	No	No opacity limits in rule.
63.6 (i)	Yes	
63.6 (j)	Yes	
§63.7 (a) - (d)	Yes	
§63.7 (e) (1)	No	See 63.1382(b)
§63.7 (e) (2) - (e) (4)	Yes	
63.7 (f), (g), (h)	Yes	
63.8 (a) - (b)	Yes	
63.8 (c) (1) (i)	No	See 63.1382(b) for general duty requirement.
63.8 (c) (1) (ii)	Yes	
63.8 (c) (1) (iii)	No	
63.8 (c) (2) - (d) (2)	Yes	
63.8 (d) (3)	Yes, except for last sentence	
63.8 (e) - (g)	Yes	
63.9 (a), (b), (c), (e), (g), (h) (1) through (3), (h) (5) and (6), (i) and (j)	Yes	
63.9 (f)	No	
63.9 (h) (4)	No	Reserved
63.10 (a)	Yes	
63.10 (b) (1)	Yes	
63.10 (b) (2) (i)	No	
63.10 (b) (2) (ii)	No	See 63.1386 for recordkeeping of

Reference	Applies to subpart NNN	Comment
		occurrence and duration of malfunctions and recordkeeping of actions taken during malfunction.
63.10 (b) (2) (iii)	Yes	
63.10 (b) (2) (iv) - (b) (2) (v)	No	
63.10 (b) (2) (vi) - (b) (2) (xiv)	Yes	
63. (10) (b) (3)	Yes	
63.10 (c) (1) - (9)	Yes	
63.10 (c) (10) - (11)	No	See 63.1386 for recordkeeping of malfunctions.
63.10 (c) (12) - (c) (14)	Yes	
63.10 (c) (15)	No	
63.10 (d) (1) - (4)	Yes	
63.10 (d) (5)	No	See 63.1386 (c) (2) for reporting of malfunctions.
63.10 (e) - (f)	Yes	
63.11	No	Flares will not be used to comply with the emissions limits
63.12 to 63.15	Yes	

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