

**National Emissions Standards for Hazardous Air Pollutants for  
Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and  
Stand-Alone Semichemical Pulp Mills  
(40 CFR Part 63, Subpart MM)  
Residual Risk and Technology Review, Final Amendments**

**Response to Public Comments on  
December 30, 2016 Proposal**

U.S. Environmental Protection Agency  
Office of Air Quality Planning and Standards  
Sector Policies and Programs Division  
Research Triangle Park, NC 27711

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## List of Acronyms and Units of Measure

AERMOD	air dispersion model used by the HEM-3 model
AF&PA	American Forest & Paper Association
AMOS	ample margin of safety
ASB	aeration stabilization basin
ATSDR	Agency for Toxic Substances and Disease Registry
AVC	automatic voltage control
BACT	best available control technology
BAT	best available technology
BLS	black liquor solids
CAA	Clean Air Act
CAER	Combined Air Emissions Reporting
CalEPA	California EPA
CaO	calcium oxide (lime)
CBI	confidential business information
CDC	Centers for Disease Control and Prevention
CDX	Central Data Exchange
CEDRI	Compliance and Emissions Data Reporting Interface
CEMS	continuous emissions monitoring system
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHIEF	Clearinghouse for Inventories and Emissions Factors
CHPAC	Children's Health Protection Advisory Committee
CMS	continuous monitoring system
COMS	continuous opacity monitoring system
CPMS	continuous parameter monitoring system
Cr III	trivalent chromium
Cr VI	hexavalent chromium
CWA	Clean Water Act
DAS	data acquisition system
D.C. Cir.	United States Court of Appeals for the District of Columbia Circuit
DCE	direct contact evaporator
dscm	dry standard cubic meters
ECHO	Enforcement and Compliance History Online
ECOS	Environmental Council of the States
EJ	environmental justice
EO	Executive Order
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPRI	Electric Power Research Institute
ERT	Electronic Reporting Tool
ESP	electrostatic precipitator
FQPA	Food Quality Protection Act
FR	Federal Register
g	grams

H <sub>2</sub> S	hydrogen sulfide
HAP	hazardous air pollutant(s)
HCl	hydrochloric acid
HEM-3	Human Exposure Model, Version 1.1.0
HQ	hazard quotient
ICR	information collection request
IPT	Integrated Project Team
IQ	intelligence quotient
IRIS	Integrated Risk Information System
ISD	Inherently Safer Design
IST	Inherently Safety Technology
kg	kilograms
km	kilometers
kV	kilovolts
LAER	lowest achievable emission rate
lb	pounds
lb/ton	pounds per ton
MACT	maximum achievable control technology
MARAMA	Mid-Atlantic Regional Air Management Association
MDL	method detection limit
mg/m <sup>3</sup>	milligrams per cubic meter
MIR	maximum individual risk
MIRC	Multimedia Ingestion Risk Calculator
MOA	mode of action
NAAQS	National Ambient Air Quality Standards
NAS	National Academy of Sciences
NCASI	National Council for Air and Stream Improvement
NDCE	nondirect contact evaporator
NEI	National Emissions Inventory
NESHAP	National Emissions Standards for Hazardous Air Pollutants
ng/dscm	nanograms per dry standard cubic meter
No.	number
NRC	National Research Council
NRDC	Natural Resources Defense Council
NSPS	New Source Performance Standards
OAQPS	Office of Air Quality Planning and Standards
ODW	Office of Drinking Water
OEHHA	Office of Environmental Health Hazard Assessment
OHEA	Office of Health and Environmental Assessment
OMB	Office of Management and Budget
PAH	polycyclic aromatic hydrocarbons
PB-HAP	hazardous air pollutant known to be persistent and bio-accumulative in the environment
PBT	persistent, bio-accumulative, and toxic
PM	particulate matter
PM <sub>2.5</sub>	fine particles (PM with particles less than 2.5 micrometers in diameter)

POM	polycyclic organic matter
PQL	practical quantitation limit
PRA	Paperwork Reduction Act/probabilistic risk assessment
PS-11	Performance Specification 11
QA	quality assurance
QA/QC	quality assurance/quality control
RACT	reasonably available control technology
RBLC	RACT/BACT/LAER Clearinghouse
RDL	representative detection level
REF	risk equivalency factor
REL	reference exposure level
RfC	reference concentration
RfD	reference dose
RTO	regenerative thermal oxidizer
RTR	residual risk and technology review
SAB	Science Advisory Board
SARA	Superfund Amendments and Reauthorization Act
SDT	smelt dissolving tank
SSM	startup, shutdown, and malfunction
STAPPA/ ALAPCO	State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials
TCDD	tetrachlorodibenzo-p-dioxin
TEF	toxic equivalency factor
TEQ	toxic equivalent
THC	total hydrocarbon
TOSHI	target organ-specific hazard index
tpy	tons per year
TRIM.FaTE	Total Risk Integrated Methodology Fate, Transport, and Ecological Exposure model
TRS	total reduced sulfur
UF-D	database uncertainty factor
UF-H	uncertainty factor for inter-human variability
µg/dL	micrograms per deciliter
µg/dscm	micrograms per dry standard cubic meter
µg/m <sup>3</sup>	micrograms per cubic meter
URE	unit risk estimate
U.S.	United States
U.S.C.	United States Code
v.	versus
VOC	volatile organic compound
WebFIRE	Web Factor Information Retrieval System
www	Worldwide Web
XML	extensible markup language

# 1. Introduction

Section 112(f)(2) of the Clean Air Act (CAA) directs the Environmental Protection Agency (EPA) to conduct risk assessments on each source category subject to maximum achievable control technology (MACT) standards and determine if additional standards are needed to reduce residual risks within 8 years after promulgation. Section 112(d)(6) of the CAA requires the EPA to review and revise the MACT standards, as necessary, taking into account developments in practices, processes, and control technologies at least every 8 years. The national emissions standards for hazardous air pollutants (NESHAP) for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Mills (40 CFR part 63, subpart MM) were promulgated in 2001 and are due for review under CAA sections 112(f)(2) and 112(d)(6).

Subpart MM is one of two NESHAP, the other being Manufacturing of Nutritional Yeast (40 CFR part 63, subpart CCCC), included in a March 12, 2015 suit filed by Sierra Club and California Communities Against Toxics. The suit asks the D.C. District Court to compel the EPA to complete the residual risk and technology review (RTR) assessments required by the CAA. Oral arguments were heard October 1, 2015, and the judge issued the deadline in March of 2016. The court order specifies a promulgation date of October 1, 2017 for completing RTRs for both subparts. In addition, on December 19, 2008, the D.C. Circuit Court vacated the startup, shutdown, and malfunction (SSM) exemption provisions in the General Provisions for non-opacity [40 CFR 63.6(f)(1)] and opacity [40 CFR 63.6(h)(1)] standards, and the EPA is evaluating the SSM provisions in subpart MM in light of this decision. The EPA is also evaluating subpart MM to determine if additional amendments are warranted – and can be done within the limited time period provided by the court-ordered deadline -- to ensure continuous compliance with the standard and to promote consistency with other standards.

To address the RTR assessments, SSM exemptions, and other changes that are warranted, proposed amendments to subpart MM were developed, signed by the EPA Administrator on December 13, 2016, and published in the **Federal Register** on December 30, 2016. A 60-day period ending February 28, 2017 was provided for the public to submit comments on the proposal to the EPA. The following sections of this document summarize the public comments received on the proposal and present the EPA's responses to those comments:

- Section 2–Risk Assessment
- Section 3–Technology Review
- Section 4–Startup, Shutdown, and Malfunction
- Section 5–Testing and Monitoring
- Section 6–Recordkeeping and Reporting
- Section 7–Compliance Dates
- Section 8–Regulatory Impacts
- Section 9–Miscellaneous Comments

A total of 10 separate sets of written comments were received on the proposal. See [www.regulations.gov](http://www.regulations.gov), Docket ID No. EPA-HQ-OAR-2014-0741, for the complete comments. Table 1 below lists the names of the commenters providing written comments, their affiliations,

and the document numbers assigned to their comments. For simplicity, only the last four digits of the document number specific to each commenter are presented in this document (*e.g.*, 0164, instead of EPA-HQ-OAR-2014-0741-0164).

**Table 1. List of Commenters on 40 CFR Part 63 Subpart MM, Proposed December 30, 2016 (81 FR 97046)**

<b>Docket Item No. EPA-HQ-OAR-2014- 0741-</b>	<b>Commenter Name</b>	<b>Affiliation</b>
0164	Annabeth Reitter	Domtar Corporation
0165	Anonymous	--
0166	Traylor Champion	Georgia-Pacific LLC
0167	Vipin Varma, Zachery Emerson	National Council for Air and Stream Improvement, Inc. (NCASI)
0168	Paul Noe	American Forest & Paper Association (AF&PA)
0169	Sarah Hedrick	Verso Corporation
0170	Russell Frye	SSM Coalition <sup>1</sup>
0171	Patrick Ortiz, Roberto Artiga	KapStone Kraft Paper Corporation
0172	Gretchen Brewer	PT AirWatchers
0173	Emma Cheuse	Earthjustice <sup>2</sup>

<sup>1</sup> Includes American Chemistry Council, American Coke and Coal Chemicals Institute, American Forest & Paper Association, American Fuel and Petrochemical Manufacturers, American Iron and Steel Institute, American Petroleum Institute, American Wood Council, Brick Industry Association, Council of Industrial Boiler Owners, Florida Sugar Industry, National Lime Association, Treated Wood Council, and Vegetable Oil SSM Coalition, (consisting of the Corn Refiners Association, the National Cotton Council, the National Cottonseed Products Association, the National Oilseed Processors Association, and Sessions Peanut Company).

<sup>2</sup> On behalf of Crossett Concerned Citizens for Environmental Justice, Harambee House, Inc., PT AirWatchers, and Sierra Club.

In some cases, one or more commenters endorsed the comments by another commenter. In those cases, the endorsement is noted in the “Miscellaneous Comments” section. The comment summaries are numbered sequentially (*e.g.*, 2.2.1-01, 02, 03, *etc.*) within each section and subsection.



## 2. Risk Assessment

### 2.1 Risk Assessment Inputs

**2.1-01 Comment:** Commenter 0168 stated that the actual emissions used in the EPA's residual risk assessment are appropriately based on industry data. The commenter believes that the EPA appropriately identified the hazardous air pollutant (HAP) emission sources and characterized emissions and source configurations for this source category. The commenter noted that, in 2011, the EPA solicited emissions from pulp and paper mills in an information collection request (ICR) to support the RTR for subpart S sources. As the commenter noted, the ICR resulted in collection of a substantial amount of information on subpart MM sources. The commenter further noted that, during the subpart S RTR process, their organization and individual pulp and paper companies provided corrections and refinements to the information. Although the improved information was not fully incorporated into the subpart S residual risk assessment, the commenter understood that the EPA used this supplemental information for the subpart MM residual risk assessment.

**Response:** We acknowledge this comment and concur that we have successfully identified the HAP emission sources, and accurately characterized emissions and source configurations for this source category. The EPA incorporated the subpart S residual risk assessment supplemental information into the risk modeling file for the subpart MM RTR, as well as additional information and updates provided by the facilities prior to risk modeling file development. The data provided in the 2011 ICR, as well as additional data provided during the subpart S RTR comment period, and the supplemental information provided by facilities enabled the EPA to develop a comprehensive and representative risk modeling file.

**2.1-02 Comment:** Commenter 0167 argued that data quality issues have the potential to positively bias the results of multipathway risk screening assessments. Specifically, the commenter stated that the use of data below method detection limits (MDL)<sup>1</sup> for Tier 1 screening analysis overestimated impacts since representative emission rates are orders of magnitude higher than screening thresholds.

According to commenter 0167, they communicated to the EPA in August 2015<sup>2</sup> that a majority of emissions data in the subpart MM inventory are based upon emission measurements either below MDL or practical quantitation limits (PQL). Specifically, the commenter wanted to highlight the emissions data for dioxins/furans and mercury used in the multipathway risk assessment. Even though the EPA has determined risks to be acceptable, the commenter wanted to reiterate that much of the existing dioxin/furan and mercury data were below MDLs and potentially overestimated the risk impacts. According to the commenter, the Tier 1 finding that 85 out of 108 facilities exceeded the persistent and bioaccumulative HAP (PB-HAP) emission cancer screening rates for dioxins/furans and polycyclic aromatic hydrocarbons (PAH) is likely the result of this phenomenon. The commenter noted that, in Tier 1 screening, inventory

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<sup>1</sup> Method detection limit is the lowest level where a measurement is distinguishable from 'zero.' Data below detection limits have high levels of uncertainty

<sup>2</sup> NCASI. *Subpart MM RTR – Assessment of the Utility of Available PCDD/F, Mercury and POM Emissions Data for Multipathway TRIM-Based Tier 1 Screening*, August 2015.

emission rates are compared against a numerical threshold to determine whether additional analyses are necessary. The commenter summarized the numerical Tier 1 thresholds for dioxins/furans, polycyclic organic matter (POM), and divalent mercury in Table 2 below.

Commenter 0167 noted that, for dioxins/furans, emissions of the 17 congeners with associated toxic equivalency factors (TEFs) were first scaled to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) using an isomer-specific risk equivalency factor (REF), which is the product of the TEF and an additional weighting factor to account for differences in oral exposure relative to 2,3,7,8-TCDD. The commenter noted that the sum of the 2,3,7,8-TCDD equivalent emissions was then compared to the threshold emission rate of 2.81E-09 tons per year (tpy) on a source by source basis. In the case of mercury, the commenter indicated that the sum of the gaseous divalent and particulate divalent mercury emissions was compared to the threshold screening rate of 3.16E-04 tpy on a source by source basis.

**Table 2. Tier 1 Thresholds for TRIM-Based Multipathway Screening Threshold**

<b>Chemical/Chemical Category</b>	<b>Screening Threshold Emission Rate, tpy</b>	<b>Basis of Threshold (Type of Health Endpoint)</b>
Dioxins (as 2,3,7,8-TCDD equivalents)	2.81 E-09	Cancer
POM (as benzo[a]pyrene equivalents)	2.58 E-03	Cancer
Mercury (divalent mercury emissions)	3.16 E-04	Non-cancer

*Dioxin/furan emissions.* Commenter 0167 noted that, as part of a recent effort to establish dioxin/furan standards for industrial boilers, the EPA developed guidance for rule writers on procedures for handling data below detection limits when analyzing emissions data for MACT and RTR emissions limits.<sup>3</sup> The commenter noted that this memorandum also determined representative detection levels (RDLs) for dioxins/furans and mercury (December 13, 2011). The commenter noted that the authors of the memorandum presented calculated RDLs for dioxins/furans in several forms, including a total collected mass basis and measured toxic equivalent (TEQ)-based concentration basis. As noted by the commenter, the memorandum also identified PQLs as three times the RDL, identifying it as the level where the measurements can be made with reasonable precision. The commenter further noted that the TEQ-based concentration RDL for the Boiler MACT data was calculated to be 0.0277 nanogram per dry standard cubic meter (ng/dscm), for a sample volume of 3 dry standard cubic meters (dscm). According to the commenter, upon analyzing the data from industrial boilers, the EPA concluded the following:

- 55 percent of the results were below MDLs and nearly all the remaining data were below the level at which they could be accurately quantified;
- Emissions of dioxins/furans from industrial boilers “cannot practicably be measured” (76 FR 80606, Friday, Dec. 23, 2011); and

<sup>3</sup> Westlin, P. and R. Merrill. *Data and procedure for handling below detection level data in analyzing various pollutant emissions databases for MACT and RTR emissions limits.* Memorandum to SPPD management and MACT rule writers. December 13, 2011. [Docket Item No. EPA-HQ-OAR-2002-0058-3839].

- The EPA decided not to establish dioxin/furan emission limits on boilers and steam generators and promulgated a work practice standard.

Commenter 0167 stated that an examination of the dioxin/furan emissions data for kraft recovery furnaces and lime kilns in their air emissions database indicates 62 percent of the isomers measured on kraft recovery furnaces and 65 percent of the isomers on kraft lime kilns were below detection limits. The commenter further stated that:

- On a total dioxin/furan basis, 10 of the 11 recovery furnaces had total dioxin/furan concentrations below the method PQL of 0.57 ng/dscm (3-hour test) estimated by the EPA;
- On a TEQ basis, all 11 furnaces were well below the PQL of 0.083 ng/dscm; and
- On both a total dioxin/furan and TEQ basis, the emissions for all 4 lime kilns were well below the respective quantitation limits.

Per commenter 0167, to facilitate a comparison to the dioxin/furan Tier 1 emission thresholds expressed in tpy, the TEQ-based RDL for dioxins/furans (0.0277 ng/dscm) was combined with the average and 90th percentile vent flowrates on recovery furnaces and lime kilns, with the comparisons presented in Table 3 below.

**Table 3. Comparison of TEQ-based RDLs for Dioxins/Furans against the Tier 1 Screening Threshold**

	Emissions, tpy	
	At the Average Vent Flow Rate	At the 90 <sup>th</sup> Percentile Vent Flow Rate
DCE Recovery Furnace	1.94 E-07	3.78 E-07
NDCE Recovery Furnace	1.78 E-07	2.66 E-07
Lime Kiln	2.72 E-08	4.17 E-07
<b>Tier 1 Screening Threshold</b>	<b>2.89 E-09</b>	

Commenter 0167 stated that, even at the RDL, presumptive emissions of dioxins/furans on a TEQ basis, both for recovery furnaces and lime kilns, are at least an order of magnitude (two orders of magnitude in most cases) higher than the Tier 1 screening threshold for dioxins/furans. Therefore, the commenter concluded, it is not surprising that Tier 1 screening (with predominantly non-detect data) indicated several facilities exceeded the cancer screening rate for dioxins/furans. According to the commenter, this is most likely a result of how the resulting emission rates compared against the Tier 1 screening threshold.

*Mercury emissions.* Commenter 0167 noted that the Tier 1 non-cancer screening threshold for mercury is 3.16E-04 tpy of divalent mercury emissions. The commenter stated that the total mercury emissions reported by facilities were combined with a speciation profile to calculate a divalent mercury emission for comparison against the threshold. The commenter noted that the EPA maintains a mercury speciation database (<http://www.epa.gov/ttnchie1/emch/speciation/>); the most recent revision (from December 10, 2006) contains a single line item for “Pulp and Paper Production – Chemical Recovery

Combustion Sources at Kraft, Soda, Sulfite, and Stand-alone Semichemical Pulping Mills (Subpart MM).” As noted by the commenter, the speciation profile for this category is 50 percent elemental mercury, 30 percent gaseous divalent mercury and 20 percent particulate divalent mercury. The commenter stated that it was not clear how this profile was developed, but it appeared to be an application of a generic industrial speciation profile.<sup>4</sup>

Commenter 0167 noted that the EPA guidance memorandum on RDLs and PQLs described above also presents calculated values for RDLs for total mercury measured using Method 29 (0.71 microgram per dry standard cubic meter (µg/dscm) for a 3-dscm test event). If the subpart MM speciation profile for mercury described above is applied to the RDL developed by Westlin and Merrill, the commenter indicated the divalent mercury concentration RDL is calculated to be 0.305 µg/dscm for a 3-dscm test event.

Commenter 0167 noted that the vent flow rate data used in the dioxin/furan analysis were used to convert the unit-specific detection limits for divalent mercury into mass-based emissions. Per commenter 0167, the divalent mercury concentration-based RDL developed by the EPA (0.305 µg/dscm) was combined with the average and 90th percentile flow rates of the dataset for recovery furnaces and lime kilns to estimate a set of detection limits for these processes, with these results compared against the multipathway modeling threshold in Table 4 below.

**Table 4. Comparison of Divalent Mercury RDLs against the Tier 1 Screening Threshold**

	<b>Emissions, tpy</b>	
	<b>At the Average Vent Flow Rate</b>	<b>At the 90<sup>th</sup> Percentile Vent Flow Rate</b>
DCE Recovery Furnace	1.66 E-03	3.23 E-03
NDCE Recovery Furnace	1.52 E-03	2.28 E-03
Lime Kiln	2.32 E-04	3.56 E-04
<b>Multipathway Threshold</b>	<b>3.16 E-04</b>	

Commenter 0167 found that, once again, the presumptive emissions of divalent mercury, both for recovery furnaces and lime kilns, are higher than the Tier 1 screening threshold in all but one instance. Therefore, the commenter concluded, it is not surprising that Tier 1 screening using these data indicated 59 out of 108 facilities exceeded the non-cancer screening rate for mercury. The commenter indicated this is also likely an artifact of how the non-detect emission rates compared against the Tier 1 screening threshold.

Even though the EPA has determined risks to be acceptable, commenter 0167 contended that the above-identified issues related to the use of highly uncertain data below MDLs in risk screening analyses (and how the RDL compares to Tier 1 screening thresholds) suggest that the multipathway risk assessments are conservative overestimates of associated risks.

<sup>4</sup> *An Overview of Methods for EPA’s National-Scale Air Toxics Assessment* (Jan. 2011) cites the Clean Air Mercury Rule – however, the origins remain unclear.

**Response:** We appreciate the commenter’s explanation of the multipathway Tier 1 screening threshold exceedances as well as the documentation provided in August 2015. The Tier 1 risk-based thresholds were derived using the Fate, Transport, and Ecological Exposure module of the EPA’s Total Risk Integrated Methodology (TRIM.FaTE) to model the fate and transport of pollutants released to the environment and the Multimedia Ingestion Risk Calculator (MIRC) to estimate transfer and uptake into the food chain and exposure to receptors consuming contaminated food products and soil. These thresholds were applied to a hypothetical environmental and exposure scenario, assuming ingestion of locally caught fish, locally grown produce and livestock, and local soil. This hypothetical “screening scenario” is intended to represent a situation in which the ingestion exposure is unlikely to be exceeded at any actual facility evaluated through the RTR program. The thresholds for Tier 1 were derived by estimating the emission rate that corresponds to a lifetime cancer risk of 1-in-1 million or a chronic non-cancer hazard quotient (HQ) of 1 for an individual exposed according to the characteristics associated with the screening scenario.

The methods used in the Tier 1 screening are intended to enable the EPA to evaluate PB-HAP emissions from multiple facilities in a source category quickly and efficiently, and to remove from consideration those that are unlikely to pose risks above levels of concern, while also minimizing the possibility of the EPA’s failing to identify risks that exceed levels of concern. The hypothetical scenario used to estimate Tier 1 thresholds is designed to be health-protective in estimating exposures and risks; specifically, it is intended to avoid underestimating exposures to PB-HAP that might be encountered for any location throughout the United States (U.S.) versus being based upon an emission limit set by detection levels. The scenario is also intended to avoid grossly overestimating risks to the point where no emissions screen out (*i.e.*, overprotective, resulting in too many “false positives”). For more details on the development of these thresholds, see Appendix 6 in the *Residual Risk Assessment for Pulp Mill Combustion Sources in Support of the December 2016 Risk and Technology Review Proposed Rule* and the *Residual Risk Assessment for Pulp Mill Combustion Sources in Support of the October 2017 Risk and Technology Review Final Rule*.

**2.1-03 Comment:** Commenter 0168 agreed with the EPA’s approach to speciating chromium and mercury for purposes of the subpart MM risk analysis. To evaluate risks of HAP emissions, the commenter stated that the method of speciating two particular HAP, chromium and mercury, is important. The commenter noted that chromium is emitted in primarily two forms, trivalent chromium (Cr III) and hexavalent chromium (Cr VI). As noted by the commenter, between these forms, Cr III has a very low toxicity and is non- carcinogenic, whereas Cr VI has greater toxicity and is known to be carcinogenic through inhalation. Because the regulated HAP is total chromium, the commenter stated that the fraction that is Cr VI needs to be estimated to conduct the risk assessment.

Commenter 0168 noted that commenter 0167 has previously conducted measurement studies of various mill sources, and they were not able to compute a Cr VI to total chromium ratio because the results of the Cr VI samples collected were generally below the detection limit, which is much higher for Cr VI than for total chromium. Table 5 below presents emissions test data from commenter 0167 for five paired test runs at two lime kilns and five paired test runs at two direct contact evaporator (DCE) recovery furnaces. EPA Method 0061 was used to measure Cr VI and EPA Method 29 was used to measure total chromium.

**Table 5. Chromium VI and Total Chromium Emissions from Two Lime Kilns and Two Recovery Furnaces**

	<b>Cr VI, lb/ton CaO</b>	<b>Total Chromium, lb/ton CaO</b>
Lime Kiln A – Run 2	<9.38E-06	2.23E-06
Lime Kiln A – Run 3	<1.11E-05	<3.99E-07
Lime Kiln B – Run 1	<1.47E-05	4.99E-06
Lime Kiln B – Run 2	<8.01E-06	1.21E-05
Lime Kiln B – Run 3	<7.18E-06	8.52E-06
Recovery Furnace A – Run 2	<1.44E-05	4.51E-06
Recovery Furnace A – Run 3	<1.35E-05	5.53E-06
Recovery Furnace C – Run 1	<1.36E-05	2.79E-06
Recovery Furnace C – Run 2	<1.03E-05	4.26E-06
Recovery Furnace C – Run 3	<9.08E-06	2.13E-06

lb/ton CaO = pounds per ton of calcium oxide (lime)

Given the lack of industry-specific source measurement data and the fact that Cr VI data are below detection limits, commenters 0167 and 0168 concurred with the EPA’s decision to estimate chromium valence states based on data collected from residual oil and solid waste combustion studies instead of opting to conservatively assume that all chromium emissions are hexavalent. The commenters indicated they were not aware of additional source measurement data that could shed further light on this issue and, as such, considered the EPA’s approach to address chromium speciation to be reasonable.

Commenter 0168 noted that mercury is a non-carcinogenic toxic substance, which can potentially deposit and concentrate in the environment depending on the form in which it is emitted. The commenter further noted that, given its high vapor pressure, mercury emitted from combustion-related activities is present in both vapor and particulate forms. According to the commenter, elemental mercury is the gaseous, relatively insoluble form of mercury that is most subject to long-range transport and least subject to deposition, while divalent mercury is emitted in both vapor and particulate form, both of which readily deposit through dry and wet deposition, thus allowing mercury to enter the ecosystem. The commenter concluded that, while the form of mercury does not have a bearing on inhalation risk, it is a key determinant to the multi-pathway risk assessment. The commenter noted that the EPA, citing a lack of industry-specific data, applied the National Emissions Inventory (NEI) default speciation, which assumes half of the mercury emissions are divalent. Based on a recent review of available measurement data from industrial processes in the U.S. and worldwide,<sup>5</sup> the commenter stated that the divalent mercury ratio applied by the EPA appears to a conservative upper limit.

<sup>5</sup> Zhang, L. *et al.* 2016. “Mercury transformation and speciation in flue gases from anthropogenic emission sources: a critical review,” *Atmos. Chem. Phys.*, 16, 2417–2433, <http://www.atmos-chem-phys.net/16/2417/2016/acp-16-2417-2016.pdf>

**Response:** We acknowledge this comment and acknowledge that the use of the default NEI speciation was appropriate given that Cr VI test results are typically below the detection limit and emission source mercury speciation was unavailable for this sector.

**2.1-04 Comment:** Commenter 0173 stated that the EPA unlawfully ignores and underestimates exposure because emissions are underreported and underestimated. The commenter stated that the EPA's many memos on the data in the record are riddled with gaps, provide all different kinds of emissions estimates as opposed to actual emission testing, and looking at any one of them shows that the EPA is likely underestimating emissions due to particular assumptions and its sole reliance on industry-reported data.

According to commenter 0173, the ICR emissions inventory significantly underestimates emissions because the emission inventory is largely calculated from emission factors and engineering judgment, and it is well documented that emission factors underestimate emissions for a variety of reasons including inherent bias in the factors themselves (specifically, the assumption that equipment is operating as designed under normal conditions) and the inability to account for equipment malfunctions and environmental conditions (*e.g.*, wind speed). The commenter argued that incorporation of this erroneous assumption in the development of emission factors significantly distorts emissions data in two significant ways – neither the emissions that are generated during upset and SSM events, nor the increased emissions that result from poor maintenance of equipment, are accounted for in a facility's reported emissions and emissions inventories.

**Response:** We used the best and most robust facility-specific HAP emissions inventory available to us, which was the 2011 ICR, as updated by individual mills, in performing the analysis for the proposed rule. If site-specific emissions data were available, sites used these data preferentially over emission factors. We conducted a thorough and exhaustive review of the data submitted through the ICR and we followed up on source-specific information on a facility-by-facility basis, as documented in the memorandum *Preparation of Residual Risk Modeling Input File for Subpart MM* (see Docket Item No. EPA-HQ-OAR-2014-0741-0099).

We disagree with the commenter that emissions from events such as poor maintenance of equipment should be included in the risk analysis. The purpose of the risk review is to evaluate whether the emission limits – the “standards promulgated pursuant to subsection (d)” not the non-compliance with those standards – should be made more stringent to reduce the risk posed after compliance with the underlying MACT standard.

**2.1-05 Comment:** Commenter 0173 stated that pulp mills release unlimited emissions during SSM periods each year, because under the existing standards the SSM exemption allows them to emit freely without any restrictions during these time periods. According to the commenter, these completely uncontrolled and unlimited emissions pose significant health risks to nearby communities. The commenter stated that the EPA must account for the health risks from emissions during startup and shutdown periods, and during upsets and malfunctions, instead of ignoring these risks, particularly since these emissions can be significantly higher than emissions at any other time of source operation. Ignoring these emission spikes is equivalent to treating additional health risk caused by exceedances as zero, according to the commenter.

Commenter 0173 added that the EPA's own scientists stated that the EPA may be underestimating actual maximum short-term emissions, through the use of low, short-term emissions factors and "data filtering" such that "accidental releases were dropped", thus also underestimating maximum health risk for the most-exposed person.<sup>6</sup> The commenter asserted that the dropping of all so-called "[a]ccidental releases" removes most of the maximum short-term emissions numbers that the EPA must consider if it indeed wishes to fulfill the CAA's requirement and its own interpretation of its responsibility.

Regarding the issue of accidental releases, commenter 0173 objected to the use of the term "accidental" since according to the commenters, many of these events can be prevented. The commenters also asserted that emissions from SSM are still lawful and thus should be considered to be part of the "allowable" emissions in the risk evaluation. In contrast to EPA policy, the commenter suggested that emissions from accidental releases must be evaluated even if they exceed the "allowable" emissions and are considered a violation of the standard. The commenter also stated that the EPA did not say that it removed only emissions that were accidental releases that exceeded the level of emissions standards.

In support of their arguments, commenter 0173 noted that the Science Advisory Board (SAB) has also questioned how the risk from these emissions are addressed and has even criticized the EPA's estimation of maximum short-term emissions. The commenter expressed concern that the EPA's method of calculating acute risk using a "worst-case" scenario is not actually representative of the "worst case" because it ignores all malfunctions which exceed the standards. The commenter stated that the EPA could simply use a more accurate factor (based on statistical methods and probability factors) to account for malfunctions for acute and other types of health risk, to close the gap and respond appropriately to the SAB's criticism of its current method.

Commenter 0173 noted that, to create representative factors to assess the health risk from malfunctions, the EPA has information available or can collect information on major sources' malfunction and violation histories. The commenter also stated that, if more refined emissions data is needed, the EPA should simply request additional data from sources.

**Response:** While we appreciate the additional information provided by the commenter about specific emissions events in violation of the standards, we disagree with the commenter that such emissions, whether or not they are caused by malfunction events, should be considered as part of the risk analysis. The purpose of the risk review is to evaluate whether the emission limits – the "standards promulgated pursuant to subsection (d)" not the non-compliance with those standards [section 112(f)(2)(A)] -- should be made more stringent to reduce the risk posed after compliance with the underlying MACT standard. To the extent that a source is violating the underlying MACT standard, no tightening of the emissions standard under the residual risk rule will avoid or mitigate against such violations. In other words, a source that is violating the MACT emissions standard promulgated under section 112(d) would not be any more likely to avoid such violations and comply with a different, presumably more stringent, standard

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<sup>6</sup> U.S. EPA. *Residual Risk Assessment for Pulp Mill Combustion Sources in Support of the December 2016 Risk and Technology Review Proposed Rule* (Draft Risk Assessment). December 2016. Docket Item No. EPA-HQ-OAR-2014-0741-0152. appx. 5 at 3, Ted Palma & Roy Smith, *Analysis of data on short-term emission rates relative to long-term emission rates*.



promulgated under section 112(f). Such events are violations and subject to enforcement by the EPA, the States or citizens, and an action for injunctive relief is the most effective means to address such violations, whether or not they are caused by malfunctions, if an emissions event poses a significant health or environmental risk. While we agree with the commenter that the original standards did provide some relief for malfunctions, we proposed to remove the SSM provisions from the MACT standard, consistent with the Court's decision in *Sierra Club v EPA*. Thus, at proposal, we evaluated risk based on the MACT standards as they would be modified to incorporate this revision. We continue to follow that approach for the final rule. Because we are finalizing standards that would apply at all times, we are evaluating the emissions that would be allowed (*i.e.*, that would not be a violation) during these events as part of our risk view. As part of the ICR, the EPA collected maximum-hourly emission rates to assess short-term risks. These data were utilized to calculate acute multipliers that were subsequently used to estimate acute risk. It is important to note that the estimated acute risk assumes a catastrophic release such that all the emissions from an event are emitted during a single hour time period. The reference the commenter refers to for "dropping accidental releases" is not relevant to this subcategory because process-specific peak-to-mean ratios were developed for acute modeling. For more details on the acute multipliers developed for this source category, see *Preparation of Residual Risk Modeling Input File for Subpart MM* (see Docket Item No. EPA-HQ-OAR-2014-0741-0099).

**2.1-06 Comment:** Commenter 0173 objected to the EPA's estimation of chronic exposure at the census block centroid instead of at the facility fence or property line. Furthermore, the commenter stated that the EPA made no effort to move receptor points closer to the facility to assess chronic or cancer risk, even where local residents live nearer to a facility than the census block centroid. According to the commenter, this conflicts with the recommendation of the SAB, which has urged the EPA to consider "specific locations of residences."<sup>7</sup> The commenter stated that taking geographic variation out of the equation fails to properly account for exposure to the "individual most exposed to emissions" as required by section 112(f)(2)(A), and fails to provide an accurate estimate of risk. The commenter argued that estimating the annual average concentrations at the area-weighted centers of census blocks blatantly and artificially underestimates the risk estimated for people at the fence-line since the center of a census block is almost always further away from the facility than the fence-line. The commenter also noted that census blocks vary greatly in size, yet the EPA provides no evidence that it reviewed census block size or configuration to consider how concentrations of pollutants might vary within these blocks. Therefore, the commenter concluded, area-weighted centers of census blocks may be significantly underestimating exposure in some cases.

Commenter 0173 stated that the EPA's failure to adjust receptor points for residents living on the fence-line is particularly inexcusable given that the EPA's air dispersion model (AERMOD) allows for such an adjustment, and that such an adjustment was appropriately made

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<sup>7</sup> U.S. EPA, Office of the Administrator Science Advisory Board. Review of the EPA's draft entitled, *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-SAB-10-007. May 7, 2010. SAB May 2010 at 4, *supra* n. 124.  
[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).

for the estimation of acute health risks.<sup>8</sup> The commenter concluded that, having recognized that the maximum exposed individual for acute risks is likely present at the fence-line, the EPA cannot justify failing to analyze cancer and other chronic health effects in a similar manner.

**Response:** In a national-scale assessment of lifetime inhalation exposures and health risks from facilities in a source category, it is appropriate to identify exposure locations where it may be reasonably expected that an individual will spend a majority of his or her lifetime. In determining chronic risks, it is appropriate to use census block information on where people actually reside, rather than points at the property line, to locate the estimation of exposures and risks to individuals living near such facilities. Census blocks are the finest resolution available as part of the nationwide population data (as developed by the U.S. Census Bureau); on average, a census block is comprised of approximately 40 people and about 10 households. In the EPA risk assessments, the geographic centroid of each census block containing at least one person is used to represent the location where all the people in that census block live. The census block centroid with the highest estimated exposure then becomes the location of maximum exposure, and the entire population of that census block is assumed to experience the maximum individual risk. In some cases, because actual residence locations may be closer to or farther from facility emission points, this may result in an overestimate or underestimate of the actual annual concentrations (although there is no systematic bias for average levels). Given the relatively small dimensions of census block in densely-populated areas, there is little uncertainty introduced by using the census block centroids in lieu of actual residence locations. There is the potential for more uncertainty when the census blocks are larger, although there is still no systematic bias. The EPA concludes that the most appropriate locations at which to estimate chronic exposures and risks are the census block centroids because: (1) census blocks are the finest resolution available in the national census data; (2) facility fence-lines do not typically represent locations where chronic exposures are likely (*i.e.*, people do not typically live at the fence-line of facilities); and (3) there is no bias introduced into the estimate of maximum individual risk (MIR) by using census block centroid locations. In its peer review of the methodologies used to estimate risks as part of the RTR rulemaking efforts, the EPA's SAB endorsed this approach.<sup>9</sup>

In addition to the approach described above, the EPA recognizes that where a census block centroid is located on industrial property or is large and the centroid is less likely to be representative of the block's residential locations, the block centroid may not be the appropriate surrogate. For this source category, as described in the *Residual Risk Assessment for Pulp Mill Combustion Sources in Support of the December 2016 Risk and Technology Review Proposed Rule* (see Docket Item No. EPA-HQ-OAR-2014-0741-0152) and the *Residual Risk Assessment for Pulp Mill Combustion Sources in Support of the October 2017 Risk and Technology Review Final Rule*, in cases where a census block centroid was within 300 meters of any emission source (and therefore possibly on facility property), we viewed aerial images of the facility to determine whether the block centroid was likely located on facility property. Likewise, we examined aerial

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<sup>8</sup> 81 FR 97056 (stating that the EPA evaluated acute exposures and risks "at the point of highest potential off-site exposure for each facility," *i.e.*, not just the census block centroids); *Draft Risk Assessment* (-0152) at 11.

<sup>9</sup> U.S. EPA, Office of the Administrator Science Advisory Board. Review of the EPA's draft entitled, *Risk and Technology Review (RTR) Risk Assessment Methodologies: For Review by the EPA's Science Advisory Board with Case Studies – MACTI Petroleum Refining Sources and Portland Cement Manufacturing*. EPA-SAB-10-007. May 7, 2010. [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).

image of all large census blocks within one kilometer (km) of any emission source. If the block centroid did not represent the residential locations within that block, we relocated it to better represent them and/or we added receptors for residences nearer to the facility than the centroid. For this source category, we added several receptors for census blocks where the centroid location was not representative of the residential locations. Appendix 7 of the risk assessment document cited above provides additional information on these changes.

**2.1-07 Comment:** Commenters disagreed about the emissions data that the EPA used to evaluate acute health risks. Commenter 0168 agreed with the EPA's decision to use industry and process-specific peak-to-mean emission rate ratios for evaluating acute risks. The commenter noted that annual average emissions were applied to estimate long-term risks associated with chronic health effects and cancer, and peak 1-hour exposure and risk were based on estimates of maximum short-term emission rates. As the commenter noted, the standard method used as a default in the EPA's Human Exposure Model (HEM-3) applied for the inhalation risk assessment, is to assume that all HAP emission sources at a mill simultaneously emit at a factor of 10 times the actual annual average rate. The commenter noted that this factor was derived from a remote sensing study in an area of Houston, Texas where there are many refineries and chemicals plants, which tend to experience short-term episodic emissions. The commenter agreed with the EPA's approach in the residual risk assessment to develop and apply peak-to-mean factors specifically tailored to emission sources in the pulp and paper source category, with the acknowledgement that a peak-to-mean factor of 10 is not appropriate for all source types and categories. The commenter noted that the EPA developed factors for specific process groups ranging from 1.3 to as high as 4.7 for chemical recovery sources. According to the commenter, while these factors are much more realistic than the default factor, HEM-3 adds another layer of conservatism into short-term risk assessments by applying these factors simultaneously to each emission unit.

Commenter 0173 argued that the EPA underestimated the acute health risks, noting that the EPA based its estimation of peak emissions of all HAP from subpart MM units on the ratio of peak-to-mean emissions from a group of diverse volatile organic compound (VOC) sources in Texas in 2001.<sup>10</sup> However, the commenter noted that, among other things, the ratio of mean to peak emissions will vary depending on whether the emissions from the sources are controlled by a pollution control device and whether the processes involved are continuous or batch processes. According to the commenter, the EPA provided no detailed evaluation of the Texas data or any explanation of how those data are relevant to this source category. The commenter noted that this is of particular relevance to particulate matter (PM) emissions that are employed as surrogates for the nickel and cadmium emissions that are among the risk drivers for this subcategory. The commenter noted the EPA's acknowledgement that it has no data on peak PM emissions or the ratio of peak-to-mean emissions from the sources in this subcategory,<sup>11</sup> but employed the VOC-based data for other industries nonetheless.

Based on engineering principles, commenter 0173 stated that the peak short term PM emissions from these sources could be as much as 200 times the reported reference method tests

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<sup>10</sup> Presumably these data are prior to the effective date of the relevant MACT standard.

<sup>11</sup> 81 FR 97057, 97075.

during periods of malfunctions; specifically, if an electrostatic precipitator (ESP) control device with a 99.5 percent control efficiency fails to function, emissions will increase by a factor of 200.

Commenter 0173 also argued that any calculation of emissions allowed by opacity limits should take into account the fact that compliance with the subpart MM PM limits will not likely correlate with the opacity limit, but will follow the reference test method. The commenter stated that it was unclear how the EPA had calculated health risks based on this limit. Given the differences between stacks and processes, the commenter indicated that the only way that the EPA can reasonably assure that PM permit limits are maintained through the use of continuous opacity readings is to calibrate the stack's opacity to its PM emissions on a site-specific basis. The commenter stated that this is the operating principle of PM continuous emissions monitoring systems (CEMS).

**Response:** We acknowledge the comment from commenter 0168 and agree that the use of process-specific acute multipliers was more appropriate for this source category than the use of the default factor of 10. For this source category, data were available from the 2011 ICR which enabled the EPA to calculate process-specific peak-to-mean emission rate ratios for use as process-specific acute multipliers, as documented in the memorandum *Preparation of Residual Risk Modeling Input File for Subpart MM* (see Docket Item No. EPA-HQ-OAR-2014-0741-0099). In the absence of site-specific data, the use of the default factor of 10 is appropriate, as responded to below.

We disagree with the comment from commenter 0173 that acute health risks are underestimated when applying the acute default peak factor of 10. When screening for potentially significant acute exposures, we used an estimate of the highest hourly ambient concentration at any off-site location as the surrogate for the maximum potential acute exposure concentration for any individual. These hourly concentrations are based on hourly emissions. Since information is not usually available on short-term emission rates, we generally apply the assumption that the maximum 1-hour emission rate from any source is 10 times the average annually hourly emission rate for that source. (The average hourly emissions rate is defined as the total emissions for a year divided by the total number of operating hours in the year.) This choice of a factor of 10 for acute screening was originally based on engineering judgment and is used if no additional information is available and has been endorsed by the SAB.

For this source category, the default factor of 10 was not applied, since source category data were available to provide a more realistic acute peak-to-mean hourly value for each of the emission process groups. Peak hourly emission rate data were available as a result of the 2011 ICR which enabled the EPA to calculate process-specific peak-to-mean emission rate ratios for use as process-specific acute multipliers, as documented in the memorandum *Preparation of Residual Risk Modeling Input File for Subpart MM* (see Docket Item No. EPA-HQ-OAR-2014-0741-0099). All subpart MM HAP, PM, and VOC emissions data from the ICR were compiled and ratios for each compound from each emission source type were calculated and used in the modeling file.

The EPA did not calculate health risks based on the opacity limit, but rather the HAP metals data provided through the ICR, as well as the PM data provided to determine the acute multipliers. Data that were provided through the ICR were process-specific, based on either test

results or emission factors. With respect to the comment suggesting that continuous opacity must be calibrated to stack PM emissions on a site-specific basis and the use of PM CEMS, this comment is not relevant to the EPA's risk modeling for this source category because opacity data were not used to assess health risks.

**2.1-08 Comment:** Commenter 0173 stated that toxic air pollutants emitted by pulp mills contribute to a wide range of serious health impacts. Commenter 0173 also provided a summary of emissions from the modeling file and health impacts for 18 pollutants. The pollutants were: benzene, toluene, ethylbenzene, xylene, PAH, naphthalene, 1,3-butadiene, formaldehyde, acetaldehyde, arsenic, cadmium, chromium VI, lead, manganese, mercury, nickel, hydrochloric acid (HCl), and hydrogen fluoride.

**Response:** We acknowledge the commenter's summary of emissions in the modeling file from source category emission units and the human health impacts associated with each of the 18 pollutants. While the human health impacts are supported with documentation, it is important to note that quantity, dispersion, and receptor location are important when determining human health impacts. Using these factors with the HEM-3 model, the EPA found that the risks from this source category were acceptable.

## 2.2 Risk Assessment Methods

### 2.2.1 Inhalation Risk Screening

**2.2.1-01 Comment:** Commenter 0168 stated that the HEM-3 model which the EPA used is suitably conservative for inhalation risk screening. The commenter noted that HEM-3 combines annual average and maximum 1-hour estimates of ambient HAP concentrations derived from atmospheric dispersion models with dose response factors to assess chronic health effects, cancer risk and acute exposure. The commenter further noted that, to assess long-term health risks, model receptors were placed in the center of each census block, the smallest geographical division in which U.S. Census data is collected. As noted by the commenter, the dose response factors used in the model assume that everyone inside the block lives outdoors for 70 years, with an average lifetime weight of 70 kilograms (kg) (154 pounds [lb]) and inhales 20 cubic meters of air a day, an upper limit for most individuals.<sup>12</sup> Although these assumptions overestimate risks for most people, the commenter concurred that they are appropriate for the nationwide screening-level risk assessment conducted for the residual risk assessment. If a refined assessment were required, the commenter suggested the EPA should consider refinements to this approach, such as accounting for personal mobility and indoor reduction of airborne HAP concentrations.

Commenter 0168 noted that their organization supplied information regarding misplaced on-site receptors to the EPA during the subpart S RTR that were determined to be on mill property, and that the EPA eliminated these receptors in the subpart MM residual risk assessment. According to the commenter, another change in receptors that the EPA made was to add receptors in the vicinity of nearby residential areas that they determined to be under-

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<sup>12</sup> U.S. EPA 2011. *EPA Exposure Factors Handbook*, Table 6.1.  
[https://ofmpub.epa.gov/eims/eimscomm.getfile?p\\_download\\_id=526167](https://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=526167)

represented by the census block receptors. The commenter concurred that both types of adjustments were suitable to more accurately model population risk.

Commenter 0168 noted that AERMOD, the EPA's guideline air quality model, is applied with 1-year of meteorological data using data set generated for 2014. The commenter stated that, in assessing maximum off-site cancer risk, the application of a single year to estimate lifetime inhalation is conservative because the wind direction frequency distribution is likely always more peaked than a 70-year lifetime average. However, the commenter believes that, unless a single year was climatologically aberrant, the degree of conservatism is minor. The commenter noted that, in applying HEM-3, the EPA used stack parameters and locations that were vetted by their organization as part of the 2011 ICR review. The commenter further noted that the EPA used one simplification in its nationwide residual risk assessments, which was not to include the effects of buildings in the dispersion assessment. The commenter agreed that this simplification is suitable and does not materially affect the modeled risks since chronic risks are estimated at population-based receptors located at the center of census block, rather than along the property boundary.

Commenter 0168 noted that HEM-3 computes cancer risk by multiplying the annual average concentration of each carcinogenic HAP by the unit risk estimate (URE) (based on the noted continuous exposure assumptions) and then sums the risks. The commenter stated that this method of cancer risk estimation assumes that there is no co-dependency on cancer potency and that the specific type of cancer is not pertinent. The commenter noted that non-cancer risk is computed as a HQ for each HAP determined by dividing the annual average concentration by the reference concentration (RfC) for specific target organs or systems; the sum of the HQs for each target organ is computed. For acute effects, the commenter noted that each HAP is addressed separately based on the maximum 1-hour concentration compared to a suitable risk-based concentration. The commenter concurred that these approaches are suitable for the screening-level residual risk assessment.

**Response:** We acknowledge this comment and we consider the use of HEM-3 as a refined inhalation assessment, without the refinements to the risk assessment approach such as accounting for personal mobility and reduction of exposure due to reductions seen in airborne HAP concentrations. We also appreciate that commenter 0168 provided information regarding misplaced on-site receptors and we made model adjustments accordingly to more accurately model population risk.

The commenter is also correct that the EPA did not include the effects of buildings in the dispersion assessment. Building downwash could result in an underestimation of maximum risks near a facility, but has no effect on risks further away from the fence line. Building downwash parameters were not available for this source category.

The commenter is correct regarding how HEM-3 computes cancer and non-cancer risks. It is the EPA's policy that a risk characterization be prepared in a manner that is clear, transparent, reasonable, and consistent with other risk characterizations of similar scope prepared across programs in the Agency.

**2.2.1-02 Comment:** Commenter 0173 stated that the EPA failed to use the best available reference values for a number of key HAP including benzene, and thus underestimated risk from these pollutants.

Regarding cancer risk, commenter 0173 recommended using the latest cancer potency values as published by the California EPA (CalEPA) in updated guidance in 2015. The commenter performed a comparison of the CalEPA values and those used by the EPA and claimed for some HAP (including 1,3 butadiene, benzene, cadmium compounds, and Cr VI compounds) the UREs are at least 57 percent lower. The commenter also stated an emissions weighted analysis of the different potency values used by the EPA versus those recommended by CalEPA shows that cancer risk may have been two times higher had the EPA utilized up-to-date factors.

Regarding non-cancer chronic risk, commenter 0173 also recommended that the EPA use the latest chronic inhalation RfCs published by CalEPA in their 2015 guidance. The commenter claimed that the EPA's RfCs for some HAP (including benzene, toluene, manganese, mercury (elemental), and nickel) are less protective than those published by CalEPA by at least a factor of 3.

Regarding non-cancer acute risk, commenter 0173 also recommended that the EPA use the up-to-date benzene value from CalEPA in its risk assessment and update the assessment accordingly. The commenter claimed that the acute reference value used to evaluate benzene exposure is two orders of magnitude too high, leading to a very significant underestimation of the acute non-cancer health hazards of benzene emissions from pulp mills. The commenter noted that the EPA used an acute reference exposure level (REL) of 1.3 milligrams per cubic meter ( $\text{mg}/\text{m}^3$ ), while CalEPA uses a value of  $0.027 \text{ mg}/\text{m}^3$  based on the latest science.

**Response:** The EPA's chemical-specific toxicity values are derived using risk assessment guidelines and approaches that are well established and vetted through the scientific community, and follow rigorous peer review processes.<sup>13</sup> The RTR program gives preference to EPA values for use in risk assessments and uses other values, as appropriate, when those values are derived with methods and peer review processes consistent with those followed by the EPA. The approach for selecting appropriate toxicity values for use in the RTR Program has been endorsed by the SAB.<sup>14</sup>

The EPA scientists reviewed the information provided by the commenter regarding the CalEPA values and concluded that further information is needed to evaluate the scientific basis and rationale for the recent changes in CalEPA risk assessment methods and their application for individual toxicity values. Until the EPA has completed its evaluation, it is premature to determine what role these values might play in the RTR process. Although EPA uses many of

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<sup>13</sup> U.S. EPA, Integrated Risk Information System (IRIS). IRIS Guidance documents available at <http://www.epa.gov/iris/backgrd.html>

<sup>14</sup> U.S. EPA, Science Advisory Board (SAB).

<http://yosemite.epa.gov/sab/sabproduct.nsf/0/b031ddf79cffded38525734f00649caf!OpenDocument&TableRow=2.3#2>

CalEPA's toxicity values in the RTR risk assessment, we did not use the new CalEPA toxicity values as part of this current rulemaking.

We disagree with the comment that the EPA should adopt the CalEPA acute REL for benzene. The EPA has an approach for selecting appropriate health benchmark values and in general, this approach places greater weight on the EPA-derived health benchmarks than those from other agencies. The approach favoring EPA benchmarks (when they exist) has been endorsed by the SAB, and ensures values most consistent with well-established and scientifically-based EPA policy.

**2.2.1-03 Comment:** Commenter 0173 argued that the EPA unlawfully and arbitrarily treated risk as zero for some pollutants. The commenter stated that the EPA underestimated health risks by not using the best available information on pollutants and by treating various types of risk as zero when the science shows risk is present. The commenter asserted that, just because the EPA has not yet developed a reference value for a pollutant, type of exposure, or type of risk, does not mean risk does not exist and can be ignored. The commenter suggested that the EPA develop default approaches to support the evaluation of risk from chemicals which lack chemical-specific data. One of the approaches detailed by the commenter is the inclusion of an uncertainty factor to account for the additional risk that a HAP likely causes, until such time as the EPA does have a reference value to use. The commenter added that if a default approach is not developed, the EPA should at a minimum engage in the interim in a qualitative assessment of the additional, missing risks, and account for them in its analysis.

Commenter 0173 also argued that some pollutants continue to have no reference values over 20 years after the CAA was amended and that the Integrated Risk Information System (IRIS) review process has been bogged down for many pollutants. The commenter asserted that, for pollutants currently under IRIS assessment, the EPA must use the best available scientific information from the IRIS review during current rulemakings. At minimum, the commenter concluded that the EPA must account for the lack of reference values or the lack of an up-to-date final IRIS assessment rather than not including any consideration of health risks caused by such pollutants.

Finally, according to commenter 0173, the EPA violated the notice and comment requirements by not providing public notice of all HAP for which it did not evaluate cancer, chronic non-cancer, acute, or multipathway risk. The commenter contended that this prevented commenters from having a meaningful opportunity to present data to the EPA that may be useful in the EPA's evaluation of the risk from pollutants for which the EPA is currently treating as zero risk. The commenter stated that, in the response to comments, the EPA must confirm the list of pollutants for which it did not assess any quantitative value.

**Response:** This issue was addressed by the EPA's SAB in its May 7, 2010 response to the EPA Administrator.<sup>15</sup> In that response, the SAB panel recommended that, for HAP that do not have dose-response values from the EPA's list, the EPA should consider and utilize, as appropriate, additional sources for such values that have undergone adequate and rigorous

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<sup>15</sup> The SAB peer review of *RTR Risk Assessment Methodologies* 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).



scientific peer review. The SAB panel further recommended that the inclusion of additional sources of dose-response values into the EPA's list should be adequately documented in a transparent manner in any residual risk assessment case study. We agree with this approach and have considered other sources of dose-response data when conducting our risk determinations under RTR. However, in some instances no sources of information beyond the EPA's list are available.

For a tabular summary of HAP that have dose-response values for which an exposure assessment was conducted, refer to Table 3.1-1 of the *Residual Risk Assessment for Pulp Mill Combustion Sources in Support of the December 2016 Risk and Technology Review Proposed Rule* (December 2016), Docket Item No. EPA-HQ-OAR-2014-0741-0152 and the *Residual Risk Assessment for Pulp Mill Combustion Sources in Support of the October 2017 Risk and Technology Review Final Rule*.

The EPA agrees that it is important to develop dose-response values for all HAP utilizing all credible and relevant toxicity information. The need to update assessments with newly available data as well as the need to complete toxicological assessments for all HAP lacking dose-response assessments increases the importance of Agency activities to streamline and fully utilize the EPA's already overloaded IRIS program. To that end, the EPA has always prioritized for IRIS assessments those HAP without dose-response values but with the greatest potential for public exposure. As a result of this prioritization, while not all HAP may have scientifically accepted dose-response values that can be used in residual risk assessments, it is clear that the vast majority of HAP which might carry the potential to significantly impact the results of residual risk assessments do, in fact, have credible dose-response values. Thus, while we are not yet at the point where we have determined dose-response values for all HAP, we are generally capable of deriving reasonable risk estimates for those HAP which dominate the risks from any one source category. In the course of each residual risk assessment, should we encounter HAP for which we have not determined dose-response values and which carry the potential to create significant risks, we point those out as uncertainties and target them for future IRIS assessments. In general, we strive to strike a balance in our assessments, meaning that while some factors likely lead to underestimates of risk, others likely lead to overestimates of risk. We conclude that the risk assessment for this source category is sufficient to support a decision on the acceptability of the risk and ample margin of safety (AMOS).

**2.2.1-04 Comment:** Commenter 0173 asserted that the EPA must recognize that chronic (non-cancer) risk-causing pollutants have no safe level of exposure, noting that the National Academy of Sciences (NAS) recommends that cancer and chronic non-cancer risk assessment use the same approach in order to address the fact that very low levels of non-carcinogen exposures can pose health risks. The commenter noted that the use of RfDs for dose-response risk assessments of chronic non-cancer health effects may significantly underestimate risk, because the NAS defines the RfD or RfC as a dose "likely to be without an appreciable risk of deleterious effects" over a lifetime of exposure.

Commenter 0173 identified what they see as the problems with traditional toxicology as the basis for risk assessments, including the presumption that health effects are related to dose, and that a dose can be found for virtually all chemicals where no effect is found. The commenter claimed that the greatest public health threat of chemicals is for fetal exposure, meaning that the dose may be less important than the timing, and furthermore that for some toxic chemicals, the clinical effect can actually increase as the chemical concentration decreases, meaning that there is no safe level of exposure. For example, the commenter noted that a 2009 statement by the Endocrine Society stated that “[e]ven infinitesimally low levels of exposure, indeed, any level of exposure at all, may cause endocrine or reproductive abnormalities, particularly if exposure occurs during a critical developmental window. Surprisingly, low doses may even exert more potent effects than higher doses.”<sup>16</sup> The commenter also noted that a recent panel of twelve national endocrine disruptor specialists recently stated that “[for] every chemical that we looked at that we could find a low-dose cutoff, if it had been studied at low doses it had an effect at low doses.”<sup>17</sup> Finally, the commenter cited a report published in *The New England Journal of Medicine*, regarding the toxicity of volatilized compounds from oil, which states that: “Mutagenic effects theoretically can result from a single molecular DNA alteration. Regulatory prudence has led to the use of “one-hit models” for mutagenic end points, particularly cancer, in which every molecule of a carcinogen is presumed to pose a risk.”<sup>18</sup>

**Response:** Chronic noncancer dose response values used in the RTR program, including those derived by the EPA and similar authoritative agencies (*e.g.*, Agency for Toxic Substances and Disease Registry (ATSDR) and CalEPA) represent chronic exposure levels that are intended to be health-protective. Those values are derived using an approach that is intended to avoid an underestimate of risk in the face of uncertainty and variability. When there are gaps in the available information, the EPA applies uncertainty factors to derive reference values that are protective against appreciable risk of deleterious effects. Uncertainty factors are commonly default values<sup>19</sup> (*e.g.*, factors of 10 or 3) used in the absence of compound-specific data; where data are available, data-derived extrapolation factors may also be developed using compound-specific information. When data are limited, more assumptions are needed and more default factors are used. Thus, there may be a greater tendency to overestimate risk—in the sense that

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<sup>16</sup> Endocrine Society, *Scientific Statements*, <https://www.endocrine.org/endocrine-press/scientific-statements>. Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 59.

<sup>17</sup> Vandenberg, L. *et al.* “Hormones and endocrine-disrupting chemicals: low-dose effects and nonmonotonic dose responses.” *Endocrine Rev*; doi:10.1210/er.2011-1050 [online 14 Mar 2012]. Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 60.

<sup>18</sup> Goldstein B., H. Osofsky, and M. Lichtveld. “The Gulf Oil Spill.” *N Engl J Med* 2011; 364:1334-1348 April 7, 2011.

<sup>19</sup> According to the National Research Council (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 specific substance when it believes this to be appropriate. In keeping with the 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>.

further study might support development of reference values that are higher (*i.e.*, less potent) because fewer default assumptions are needed.

For some pollutants, however, there is a slight possibility that risks could be underestimated. Where data indicate a potential vulnerability of a specific life-stage, the EPA includes this information in its derivation of cancer and noncancer dose-response values. As mentioned above in this response, in some instances, data are not available for a robust characterization of risk during a specific life-stage and, in that case, potential susceptibilities are accounted for by applying the appropriate uncertainty factors.

The EPA agrees with the NAS that the recommendations on harmonization of cancer and noncancer approaches are important issues in risk assessment and the EPA incorporates NAS recommendations as feasible. The NAS has agreed with the EPA, specifically on the derivation methodology of RfCs and RfDs, that the available scientific information does not always allow for assessment derivation issues to be fully considered and it has reviewed and supported the approaches currently used in the derivation of the RfCs and RfDs. The NAS has also recognized that many of the recommended changes for the IRIS Program will need to be incorporated over a number of years and further recommend continuation of the development of assessments as the recommendations are implemented (*i.e.*, the process should not be halted until all recommendations can be enacted). As such, improvements will be made over time and existing assessments will need to be used in the interim. Further, the EPA has a legal obligation to proceed with regulatory action based on the best available data and tools. The combination of the conservative modeling approach and the best available data results in the appropriate finding that risks for this source category are acceptable.

The commenter stated that there are problems associated with traditional toxicology presumption that health effects are related to dose, however the commenter does not provide any information to consider an alternative paradigm to risk assessment that would not include an analysis of dose response relationships in the risk assessment process.

The commenter provided a reference to support the statement that there is no safe level of exposure and that for fetal exposure, the dose may be less important than the timing, and furthermore that for some toxic chemicals, the clinical effect can actually increase as the chemical concentration decreases. The review article on hormones and endocrine-disrupting chemicals focuses on a broad category of chemicals that appear to act at low concentrations. We disagree with the interpretation of the commenter on the referenced review. First, the authors of the review article do not conclude that there is no safe level of exposure for chemicals in general, not even for endocrine disruptors. We disagree with the comment that clinical effect increases as dose of the chemical decreases; rather, the authors of the review conclude that the effect of low doses of this group of chemicals cannot be predicted by effects observed at high doses, and they encourage investigators to make changes in chemical testing approaches to identify potential endocrine disruptors. We conclude that none of the information or conclusions in the review article conflicts with the EPA's determinations in this regulatory action.

We agree with the comment that the regulatory community, including the EPA, should use conservative approaches to evaluate cancer risks especially when considering cancer risks to early life stages. When chemical-specific data is available on which age or life-stage specific risk

estimates or potencies can be determined, default age dependent adjustment factors can be applied when assessing cancer risk for early-life exposures to chemicals which cause cancer through a mutagenic mode of action (MOA). With regard to other carcinogenic pollutants for which early-life susceptibility data are lacking, it is the Agency's long-standing science policy position that use of the linear low-dose extrapolation approach (without further adjustment) provides adequate public health conservatism in the absence of chemical-specific data indicating differential early-life susceptibility or when the MOA is not mutagenicity.<sup>20</sup> The basis for this methodology is provided in the 2005 Supplemental Guidance.<sup>21</sup>

**2.2.1-05 Comment:** Commenter 0173 stated that the EPA's cancer risk assessment for pulp mills does not adequately account for early-life exposure or the greater risk to and susceptibility of children. According to the commenter, the EPA must account for increased early-life susceptibility by applying age-dependent adjustment factors for *all carcinogens* emitted by a source category. The commenter noted that the EPA has restricted its application of age-dependent adjustment factors to those HAP included in the EPA's list of carcinogens that act by a mutagenic MOA.<sup>22</sup> The commenter pointed out that the EPA's 2005 Guidelines recognized that updates would be needed if more data became available,<sup>23</sup> and claimed that such data are now available from the NAS and the California Office of Environmental Health Hazard Assessment (OEHHA), yet the EPA has not issued such updates to implement age-dependent adjustment factors for all carcinogens.<sup>24</sup>

Regarding pre-natal cancer risk, commenter 0173 noted that the EPA's risk assessment does not take into account increased susceptibility to carcinogens due to pre-natal exposures, even for known-to-be mutagenic carcinogens, and that the EPA must do so for these as well as for all carcinogens.<sup>25</sup> The commenter argued that despite the EPA's own recognition that exposures of concern include pre-conception exposures of both parents through adolescence, it has not developed adjustment factors for pre-natal exposures.<sup>26,27</sup> This omission from the EPA's

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<sup>20</sup> *Id.*

<sup>21</sup> See U.S. EPA. (2005), *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens*. EPA/630/R-03/003F. Washington, DC. Available online at: <http://www.epa.gov/cancerguidelines/guidelines-carcinogen-supplement.htm>.

<sup>22</sup> *Draft Risk Assessment* (-0152) at 28; See U.S. EPA, *Guidelines for Carcinogen Risk Assessment*, EPA/630/P-03/001F, at 1-19 to 1-20 (Mar. 2005), [https://www3.epa.gov/airtoxics/cancer\\_guidelines\\_final\\_3-25-05.pdf](https://www3.epa.gov/airtoxics/cancer_guidelines_final_3-25-05.pdf) ("2005 Guidelines"); U.S. EPA, *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens*, EPA/630/R-03/003F (2005), [https://www3.epa.gov/airtoxics/cancer\\_guidelines\\_final\\_3-25-05.pdf](https://www3.epa.gov/airtoxics/cancer_guidelines_final_3-25-05.pdf) ("Supplemental Guidance").

<sup>23</sup> See *Supplemental Guidance* at 21, 31, *supra* note 167 ("EPA expects to expand this Supplemental Guidance to specifically address modes of action other than mutagenicity when sufficient data are available and analyzed.").

<sup>24</sup> CalEPA. *TSD for Cancer Potency Factors*, *supra* note 313. The EPA should also update the 2005 *Guidelines* to fully reflect current science as described in OEHHA's 2009 review of the scientific literature on increased susceptibility to carcinogens from early life exposures. Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachments 32, 34-43.

<sup>25</sup> *Draft Risk Assessment* (-0152) at 28 (noting that the EPA applied factors only to known mutagens to account for "children aged 0-1" but not younger than that).

<sup>26</sup> See U.S. EPA (2005), *Guidelines for Carcinogen Risk Assessment*, EPA/630/P-03/001F, at 1-16, *supra* note 167.

<sup>27</sup> *Supplemental Guidance* at 4-5, 14 & tbl. 1a, *supra* note 167 (discussing research on human and animal cancer risks from prenatal exposure).

2005 Guidelines was noted by NAS.<sup>28</sup> The commenter recommended that the EPA use the OEHHA methods and adjustment factors, as well as procedures to assess exposure during fetal development, to account for pre-natal susceptibility and exposures.<sup>29,30,31</sup> According to the commenter, OEHHA specifically discusses the use of a 10X adjustment factor for cancer risk to account for pre-natal (third trimester) to age 2 exposures, and the EPA should consider using this same factor.<sup>32</sup>

Regarding chronic non-cancer risk, commenter 0173 asserted that exposure to toxic agents in the intrauterine stage of life has one of the most important, potentially irreversible impacts on life-long health, but the EPA's rules are insufficient to protect human health at the critical stage of embryonic development. According to the commenter, most of the EPA's IRIS toxicity threshold values (RfCs and RfDs) used for chronic non-cancer risk assessment do not incorporate the latest science on increased susceptibility of children, and the EPA must consult and apply child-specific reference values, where available.<sup>33</sup> The commenter argued that until the IRIS values fully account for the increased risk caused by early-life exposure to an emitted pollutant, the EPA should use the OEHHA child-specific RfDs or benchmarks available to assess chronic non-cancer health risk from ingestion for certain pollutants. The commenter asserted that the EPA should also assess such risk from inhalation by using standard methods to translate these values into child-specific RfCs to assess inhalation-based risk.

Where child-specific reference values are unavailable, commenter 0173 asserted that the EPA must consult science on early exposure impacts and use an additional default uncertainty factor. Until the EPA has child-specific or child-based reference values available for a given pollutant, the commenter suggested that the EPA should apply a default uncertainty factor of at least 10 to account for increased risk from early-life exposures for non-cancer risk in this rulemaking and other risk assessments. The commenter noted that this would be consistent with the NAS recommendation on the need for the EPA to use default factors to account for greater risk<sup>34</sup>, with the science developed and considered by OEHHA, and with the 10X factor enacted

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<sup>28</sup> See NAS (2009) at 112-13, *supra* note 130; see also *id.* at 112, 196 (noting that it is a “missing” default that the EPA recognizes in utero carcinogenic activity, but fails to take account of it or calculate any risk for it as “EPA treats the prenatal period as devoid of sensitivity to carcinogenicity”).

<sup>29</sup> See CalEPA, *Technical Support Document for Cancer Potency Factors* appx. J, *supra* note 169. <https://oehha.ca.gov/media/downloads/crnrr/appendixyearly.pdf>. Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 42.

<sup>30</sup> *Id.* appx. J at 7-8 & tbl. 1.

<sup>31</sup> See CalEPA, *Air Toxics Hot Spots Program Risk Assessment Guidelines: Technical Support Document for Exposure Assessment and Stochastic Analysis* at 1-6 to 1-7 (Aug. 27, 2012) (“OEHHA 2012 Guidelines”), <https://oehha.ca.gov/air/crnrr/notice-adoption-technical-support-document-exposure-assessmentand-stochastic-analysis-aug> (“OEHHA 2012 Guidelines”).

<sup>32</sup> See *id.*; 2014 *Air Toxics Hot Spots Program Guidance Manual*, *supra* note 121, at 2. Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 31.

<sup>33</sup> OEHHA has explained why child-specific RfDs or values are needed and provided a list of chemicals. See, e.g., Cal. EPA, OEHHA, *Prioritization of Toxic Air Contaminants - Children's Environmental Health Protection Act* (Oct. 2001), [http://oehha.ca.gov/air/toxic\\_contaminants/pdf\\_zip/SB25%20TAC%20prioritization.pdf](http://oehha.ca.gov/air/toxic_contaminants/pdf_zip/SB25%20TAC%20prioritization.pdf); CalEPA, *Development of Health Criteria for School Site Risk Assessment Pursuant to Health and Safety Code 901(g): Identification of Potential Chemical Contaminants of Concern at California School Sites*, Final Report (June 2002), [http://oehha.ca.gov/public\\_info/public/kids/pdf/ChildHealthreport60702.pdf](http://oehha.ca.gov/public_info/public/kids/pdf/ChildHealthreport60702.pdf).

<sup>34</sup> See NAS (2009) at 190-93, 203, *supra* note 130.

by Congress in the Food Quality Protection Act (FQPA). As noted by the commenter, the FQPA provided that “an additional tenfold margin of safety for the pesticide chemical residue and other sources of exposure shall be applied for infants and children to take into account potential pre- and post-natal toxicity and completeness of the data with respect to exposure and toxicity to infants and children.”<sup>35</sup> Congress’s recognition of the need to use this default factor provides a model that the EPA should consider and incorporate into its residual risk assessment, according to the commenter. The commenter stated that it would be appropriate and within the EPA’s authority under CAA section 112(f)(2) to determine that the EPA must use a children’s ten-fold margin of safety factor, to fulfill the CAA’s “margin of safety” requirement.

**Response:** We disagree with the comment that this risk assessment underestimates risk to children and lacks consideration of early-life susceptibility. We acknowledge that population subgroups, including children, may have a potential for risk that is greater than the general population due to greater relative exposure and/or greater susceptibility to the toxicant. The assessments we undertake to estimate risk account for this potential vulnerability. With respect to exposure, the risk assessments we perform implicitly account for this greater potential for exposure by assuming lifetime exposure, in which populations are conservatively presumed to be exposed to airborne concentrations at their residence continuously, 24-hours per day for a full lifetime, including childhood. With regard to children’s potentially greater susceptibility to non-cancer toxicants, the assessments rely on the EPA (or comparable) hazard identification and dose-response values which have been developed to be protective for all subgroups of the general population, including children.

For example, a review<sup>36</sup> of the chronic reference value process concluded that the EPA’s RfC derivation processes adequately considered potential susceptibility of different subgroups with specific consideration of children, such that the resultant RfC values pertain to the full human population “including sensitive subgroups,” a phrase which is inclusive of childhood. With respect to cancer, the EPA uses the age-dependent adjustment factor approach referred to by the commenter, but limits the use of those factors only to carcinogenic pollutants that are known to act via mutagenic MOA, in contrast to the OEHHA approach, which uses them across the board for all carcinogens regardless of MOA. In lieu of chemical-specific data on which age or life-stage specific risk estimates or potencies can be determined, default age dependent adjustment factors can be applied when assessing cancer risk for early-life exposures to chemicals which cause cancer through a mutagenic MOA. With regard to other carcinogenic pollutants for which early-life susceptibility data are lacking, it is the Agency’s long-standing science policy position that use of the linear low-dose extrapolation approach (without further adjustment) provides adequate public health conservatism in the absence of chemical-specific

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<sup>35</sup> 21 U.S.C. 346a(b)(2)(C) (requiring that, in establishing, modifying, leaving in effect, or revoking a tolerance or exemption for a pesticide chemical residue, “for purposes of clause (ii)(I) an additional tenfold margin of safety for the pesticide chemical residue and other sources of exposure shall be applied” to protect infants and children).

<sup>36</sup> See U.S. EPA (2002), *A Review of the Reference Dose and Reference Concentration Processes*. Risk Assessment Forum, Washington, DC, EPA/630/P-02/002F.

data indicating differential early-life susceptibility or when the MOA is not mutagenicity.<sup>37</sup> The basis for this methodology is provided in the 2005 Supplemental Guidance.<sup>38</sup>

We also disagree with the comment that the risk assessment for this source category did not consider the groups that may be most at-risk (*e.g.*, pregnant women and children). When the EPA derives exposure RfCs and UREs for HAP, it also considers the most sensitive populations identified in the available literature, and importantly, these are the values used in our risk assessments.<sup>39</sup> With regard to consideration of a potential vulnerability of a specific life-stage, including time period before conception, the EPA includes this information in its derivation of cancer and noncancer toxicity assessments. For example, prenatal developmental studies in rodents, when available, are regularly considered in IRIS toxicity assessments and data are then extrapolated to predict effects in humans. In some instances, the available literature is unavailable for a robust characterization of risk during a specific life-stage and in that case the potential susceptibilities are accounted for by applying the appropriate uncertainty factors.

We disagree with the general comment that the EPA should adopt the California OEHHA child-protective scientific approach on for deriving health benchmarks. The EPA has an approach for selecting appropriate health benchmark values and in general, this approach places greater weight on the EPA-derived health benchmarks than those from other agencies. The approach of favoring the EPA benchmarks (when they exist) has been endorsed by the SAB,<sup>40</sup> and ensures use of values most consistent with well-established and scientifically-based EPA science policy. The EPA is currently evaluating the most appropriate use for the California OEHHA child-specific RfDs. We note that there are currently no such values for HAP inhalation, therefore the current utility may be limited to PB-HAP, which may be associated with non-negligible ingestion exposures. This evaluation on appropriateness of these values in the context of the RTR Program and EPA science policy is necessary prior to using these child-specific RfD.

The estimated risks must also be considered in the context of the full set of assumptions used for this risk assessment. Our UREs for HAP are considered a plausible upper-bound estimate with an appropriate age dependent adjustment; actual potency is likely to be lower and could be as low as zero. Our chronic noncancer reference values have been derived considering the potential susceptibility of different subgroups, with specific consideration of children. In addition, an extra 10X uncertainty factor is not needed in the RfC/RfD methodology because the currently available factors are considered sufficient to account for uncertainties in the database from which the reference values are derived. After considering these and other factors, we continue to consider the risks from emissions after application of the revisions to the NESHAP

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<sup>37</sup> *Id.*

<sup>38</sup> See U.S. EPA (2005), *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens*. Washington, DC. EPA/630/R-03/003F. Available online at: <http://www.epa.gov/cancerguidelines/guidelines-carcinogen-supplement.htm>.

<sup>39</sup> See U.S. EPA (2002), *A review of the reference dose and reference concentration processes*. EPA/630/P-02/002F. Risk Assessment Forum, Washington, DC. Available online at <http://www.epa.gov/raf/publications/pdfs/rfd-final.pdf>

<sup>40</sup> The SAB peer review of *RTR Risk Assessment Methodologies* 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)

for this source category to provide an AMOS (consistent with the Benzene NESHAP framework).

The EPA disagrees with the commenter that a children's default safety factor of 10 or more should be added to the EPA's reference values. In response to the 10X factor enacted by Congress in the FQPA<sup>41</sup> to the EPA non-cancer reference value derivation, the Agency evaluated their methods for considering children's risk in the development of reference values. As part of their response, the EPA (*i.e.* the Science Policy Council and Risk Assessment Forum) established the RfD/RfC Technical Panel to develop a strategy for implementing the FQPA and examine the issues relative to protecting children's health and application of the 10X safety factor. One of the outcomes of the Technical Panel's efforts was an in depth review of a number of issues related to the RfD/RfC process.<sup>42</sup> The most critical aspect in the derivation of a reference value pertaining to the FQPA has to do with variation between individual humans and is accounted for by a default uncertainty factor (UF-H) when no chemical-specific data are available. The EPA reviewed the default uncertainty factor for inter-human variability and found the EPA's default value of 10 adequate for all susceptible populations, including children and infants. The EPA also recommended the use of chemical-specific data in preference to default uncertainty factors when available<sup>43,44</sup> and is developing Agency guidance to facilitate consistency in the development and use of data-derived extrapolation factors for RfCs and RfDs.<sup>45</sup> Additionally, the EPA also applies a database uncertainty factor (UF-D) which is intended to account for the potential for deriving an under protective RfD/RfC as a result of an incomplete characterization of the chemical's toxicity. In addition to the identification of toxicity information that is lacking, review of existing data may also suggest that a lower reference value might result if additional data were available.

In conclusion, an additional uncertainty factor is not needed in the RfC/RfD methodology because the currently available factors are considered sufficient to account for uncertainties in the database from which the reference values are derived (and does not exclude the possibility that these uncertainty factors may be decreased or increased from the default value of 10).

## 2.2.2 Multipathway Screening

**2.2.2-01 Comment:** Commenter 0168 stated that the EPA's highly conservative multipathway screening analysis approach is specifically designed to overestimate risks and should not be misinterpreted to provide a realistic prediction of risk. The commenter noted that the EPA identified cadmium, dioxins, mercury and POM as HAP of primary concern, by assessing national emission totals, toxicity considerations, and bioaccumulation potential. The commenter

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<sup>41</sup> See U.S. EPA (1996), *Pesticide: Regulating Pesticides. The Food Quality Protection Act (FQPA)*. Available at <http://www.epa.gov/pesticides/regulating/laws/fqpa/backgrnd.htm>.

<sup>42</sup> See U.S. EPA (2002), *A review of the reference dose and reference concentration processes*. EPA/630/P-02/002F. Risk Assessment Forum, Washington, DC. Available online at <http://www.epa.gov/raf/publications/pdfs/rfd-final.pdf>

<sup>43</sup> See U.S. EPA (1994). *Methods for Derivation of Inhalation Reference Concentrations and Application of Inhalation Dosimetry*. EPA/600/8-90/066F. Office of Research and Development. Washington, DC. [https://www.epa.gov/sites/production/files/2014-11/documents/rfc\\_methodology.pdf](https://www.epa.gov/sites/production/files/2014-11/documents/rfc_methodology.pdf).

<sup>44</sup> See U.S. EPA (2011). *EPA Exposure Factors Handbook*, [https://ofmpub.epa.gov/eims/eimscomm.getfile?p\\_download\\_id=526167](https://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=526167).

<sup>45</sup> *Id.*



further noted that the EPA applied a standard methodology to address multi-pathway risk using the TRIM.Fate model (also referred to as TRIM). In contrast to a dispersion model such as AERMOD that is designed to simulate airborne dispersion, transport and deposition, the commenter stated that TRIM is a fugacity (or “box”) model that tracks the movement of HAP through sets of compartments representing parcels of air, soil, and water bodies, through empirically derived parameters. The commenter stated that the resultant media (air, water, soil) concentrations are then applied to estimate concentrations in biota, such as fish, crops, and livestock that are consumed as food. According to the commenter, the degree to which HAP accumulate in the media, and subsequently in biota, is highly dependent on how the TRIM configuration of compartments is arranged. The commenter stated that exposure and resultant risk is then determined by the amount of contaminated food of each type that is assumed to be consumed.

Commenter 0168 noted that the EPA starts with a worst-case configuration and then progressively reduces to the estimated risk as warranted using a three-tiered approach. The commenter noted that the EPA used the worst-case configuration to determine mill-wide emission levels for which it is assured that if emissions are below these thresholds, the health risk is insignificant. The commenter further noted that, for those mills with emissions exceeding the Tier 1 thresholds, refinements are applied in Tier 2 such as placing the water body and farms at a more realistic distances, and if needed in Tier 3 where further adjustments, such as accounting for meteorological conditions and plume height, correcting TRIM’s unrealistic assumption that pollutants are dispersed at ground level. The commenter stated that this assessment resulted in 85 mills being identified as potentially high risk at the Tier 1 level and 19 at the Tier 2 level; at Tier 3, a single mill was estimated to present marginal risk.

While the EPA’s TRIM-based methodology, given a sufficient level of adjusting, resulted in a conclusion that subpart MM sources at mills do not pose risk, commenter 0168 argued that the iterative screening method is unnecessarily conservative and provides a false impression of the actual risk posed by mills. For instance, the commenter noted that, if a mill exceeds the Tier 1 screening but passes the Tier 2 screen, it could be inferred that if a farm or fishing pond were closer, then a farmer or fisher would be subject significant health risks. According to the commenter, the EPA’s multi-pathway risk analysis demonstrates that the TRIM applied in a screening mode is a very blunt instrument that is overly conservative in many respects.

Commenter 0168 stated that a key shortcoming of TRIM is how dispersion and deposition are simulated in the model. The commenter pointed to a 2013 study by the Electric Power Research Institute (EPRI),<sup>46</sup> which demonstrated that, for an elevated point source within 10 km, and even applying TRIM in a refined mode using actual meteorological data, TRIM overestimated ground-level concentrations by 10 to 40 times. The commenter noted that, in that study, to simulate dispersion more realistically (approximating AERMOD), TRIM was applied in a two-layer configuration, where emissions were released into the upper layer and then gradually transferred to the surface layer. The commenter suggested that, for facilities with buoyant stack sources, the EPA should consider including this type of refinement in the screening stage rather than overtly raising the perception of high risk and then needing to adjust

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<sup>46</sup> See EPRI (2013), *Multi-Pathway Human Health and Ecological Risk Assessment for a Model Coal-Fired Power Plant Using a Revised Arsenic Bioaccumulation Factor for Edible Fish*, EPRI Report 1026874.

the risk estimate by changing assumptions. In short, the commenter stated that the EPA's severe and unrealistic screening approach gives the unjust implication of high risk from certain facilities. The commenter suggested that the EPA, at a minimum, should acknowledge that the TRIM screening approach is unsuitable for buoyant stack releases such as those from pulp and paper chemical recovery sources.

Commenter 0168 noted the EPA's acknowledgement that the TRIM screening approach is built upon a multitude of extremely (and unnecessarily) conservative assumptions, each requiring correction in order to reasonably characterize risk. The commenter noted that this practice of stacking one unrealistic conservative assumption on top of another is known as "compounded conservatism." According to the commenter, the EPA, in its 2005 Cancer Risk Assessment Guidelines, has recognized combining multiple overly conservative assumptions such as those in the TRIM screening approach is likely to lead to risk estimates that are above the 99th percentile of the distribution of potential risk and may be of limited use to decision makers.

Commenter 0168 noted that the EPA's TRIM screening approach, based on values on the high end of the range of possible values, is called a deterministic approach. In contrast, commenter 0168 noted that a probabilistic risk assessment (PRA) gives policymakers an understanding of the central tendency of estimated risk and the probability that actual risk will be on the high end of the range. According to the commenter, a PRA is more scientifically advanced, as it addresses compounded conservatism, links risk targets with environmental concentrations, improves transparency, and makes greater use of available data. The commenter noted that numerous offices and bodies within the EPA have endorsed or used a PRA approach for several years,<sup>47</sup> and the Agency recently released a Risk Assessment Forum White Paper on the PRA approach. The commenter further noted that the EPA's recent draft update to the Guidelines for Human Exposure Assessment also recognizes the value of a PRA approach. The commenter suggested that the EPA should consider applying a PRA approach in this assessment.

Commenter 0168 noted that another important factor in the EPA's screening assessment is the high fish ingestion rates assumed. For the multi-pathway analysis, the commenter indicated the most common source of non-cancer risk is ingestion of mercury through eating fresh water fish caught in local ponds and lakes. The commenter noted that the EPA uses the assumption that an adult angler bases his entire diet on protein from fresh water fish, eating 373 grams (g) (more than 0.8 lb) every day of his or her life. The commenter argued this far exceeds the rate of fish of all types that the average American eats, which is less than 6 g/day. The commenter stated that, according to the EPA's exposure assessment tools,<sup>48</sup> the 99th percentile consumption rate among Americans is less than half of the value used in the residual risk assessment, about 160 g/day

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<sup>47</sup>U.S. EPA. *Policy for Use of Probabilistic Analysis in Risk Assessment* (<http://www.epa.gov/spc/2probana.htm>); *Initiative to Revise the Ecological Assessment Process for Pesticides* (<https://archive.epa.gov/oppefed1/web/html/acs.html>); U.S. EPA. *Risk Assessment Guidance for Superfund (RAGS) Volume III - Part A: Process for Conducting Probabilistic Risk Assessment* (2001) (<http://www.epa.gov/oswer/riskassessment/rags3adt>); NRC. *Assessing Risks to Endangered and Threatened Species from Pesticides Policy for Use of Probabilistic Analysis in Risk Assessment* ([http://www.nap.edu/catalog.php?record\\_id=18344](http://www.nap.edu/catalog.php?record_id=18344)).

<sup>48</sup> <https://www.epa.gov/expobox/exposure-assessment-tools-approaches-indirect-estimation-scenario-evaluation#factors>, Table 10-7 Per Capita Intake of Finfish (g/kg/day).

(assuming 70 kg body weight) and the 95<sup>th</sup> percentile rate is 77 g/day. In addition, the commenter noted that multi-pathway risk assessments commonly required for regulatory approval of hazardous waste incinerators and waste-to-energy facilities have historically used adult fish ingestion rates ranging from 82 g/day to 142 g/day. The commenter also pointed out that the fish ingestion rate for an adult fisher suggested in the EPA's 2005 *Human Health Risk Assessment Protocol* is 88 g/day (Table C-1-4 COPC Intake From Fish, page C-15). According to the commenter, there is virtually no likelihood that a single individual fishing in a pond or lake in the vicinity of any paper mill in the U.S. consumes 373 g of fish every day.<sup>49</sup> The commenter suggested that the EPA, at a minimum, should consider using more realistic fish ingestion rates as part of their tiered screening risk analysis and more importantly for any refined risk analysis that they conduct for a residual risk assessment.

Commenter 0168 agreed with the EPA's approach and rationale for evaluating potential risks associated with lead compounds. Given that lead is subject to a National Ambient Air Quality Standard (NAAQS), the commenter noted that the EPA compared the maximum annual average modeled concentrations of lead compounds to the primary and secondary NAAQS of 0.15 microgram per cubic meter ( $\mu\text{g}/\text{m}^3$ ). The commenter agreed with this approach, as the NAAQS was developed considering all potential routes of exposure to airborne lead emissions and the associated effect on human health and the environment.

**Response:** The multipathway screening analysis approach used for the subpart MM RTR is consistent with the PB-HAP evaluations performed for the EPA's RTR program. The iterative approach was developed to enable the EPA to confidently screen out PB-HAP emissions unlikely to pose health risks above levels of concern (*i.e.*, a cancer risk of 1-in-1 million or a noncancer hazard of 1.0) and to focus additional resources on sources of greater concern within the category.

The Tier 1 screening approach is, by design, generic and health-protective. It was constructed for quick application to a large number of facilities in a source category to ensure that facilities having emissions below the screening rate are not further evaluated based upon their potential to pose health risks above levels of concerns. Once the Tier 1 screen is complete, facilities whose emissions exceed the emission screening threshold for any PB-HAP can be further scrutinized. Based on screening assessments conducted for RTR to date, many facilities might not screen out of the Tier 1 assessment, however, conducting a full site-specific assessment of all facilities that cannot be screened out in Tier 1 would not be practical. The use of some site-specific characteristics instead of the generic characteristics used in Tier 1 can justify adjusting the threshold emission rate for a given PB-HAP at that facility, potentially screening out the facility while maintaining a high degree of confidence that risks above levels of concern have not been overlooked.

The commenter misunderstands the role of the screening approach in their statement that 85 mills were identified as potentially high risks at the Tier 1 level. The 85 mills were identified as facilities that exceeded the Tier 1 screening value of 1, not that they were "potentially high

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<sup>49</sup> Moreover, the EPA's screening assessment already implicitly incorporates the entirely unrealistic estimate that whatever the fish consumption rate, all of the fish is contaminated to the maximum extent that a fish might be exposed to a pollutant under the emissions standards. *See, e.g., NRDC v. EPA*, 16 F.3d 1395, 1403 (4th Cir. 1993).

risks.” The exceeded screening values simply indicate that there is a need to continue on to the next tier in the screening assessment. The result of the screening assessment (Tier 1 – Tier 3) was that one of the facilities in this source category emitted PB-HAP at a rate requiring a facility-specific multipathway assessment.

The commenter is incorrect in their statement that if a mill exceeds the Tier 1 screening but does not exceed the Tier 2 screen, it could be inferred that if a farm or fishing pond were closer, then a farmer or fisher may be subject to health risks above a level of concern. The purpose of the screening is to eliminate facilities that are unlikely to pose a health risk above levels of concern so that resources can be focused on identifying which facilities could potentially pose a health risk. The screening tools do not indicate actual risks, only whether or not a facility exceeds the screening threshold.

The EPA considers the use of buoyant stack releases to be unsuitable for the Tier 2 screen. The Tier 2 screen was developed employing over 22,000 unique TRIM.FaTE model runs to improve our risk screening characterization of the modeled sites with the use of simple dispersion logarithms. The utilization of AERMOD to account for buoyant stack releases in these source category screens would not be practical due to the diverse and complex nature of the release parameters seen in individual facilities. The Tier 3 screen and site-specific multipathway assessments help account for a facility’s unique release characteristics, and we consider it is appropriate and scientifically valid at this stage to include these features of AERMOD in the EPA’s TRIM.FaTE site-specific multipathway assessments. We agree that incorporation of AERMOD deposition data and release parameters into our TRIM.FaTE modeling protocols will improve our risk assessments.

Based on sensitivity analyses and model testing, it is generally recognized that the spatial layout of the modeled domain (*e.g.*, distance to a fishable lake) and the meteorological data used (or a combination of these two factors) are more influential than physical/chemical parameters in dictating the resulting chemical concentrations in air, soil, water, sediment, and fish within TRIM.FaTE. The RTR tiered multipathway screening methodologies builds upon this concept by improving each subsequent screen with site-specific data that reduces the uncertainty of the modeled screen risk value from the previous screen; *i.e.*, Tier 3 screen values are significantly more refined than the upper bound screening levels established for Tier 1. The EPA will maintain the upper-bound Tier 1 screening levels to enable us to quickly assess the health protectiveness of the facilities being assessed, as well as to establish our baseline for any subsequent Tier 2 or Tier 3 screens.

The EPA’s approach to performing risk assessments in support of residual risk program has been reviewed and supported by the SAB several times over the past 17 years. First, in 1998 they examined our analytical and policy approach for assessing residual risk from HAP emitted from stationary sources, followed by a second review in 2000 to verify that our application to a specific source category was consistent with the approved approach. A third SAB consultation in 2006 focused on development of emissions inventories for source categories and updated methods for characterizing human exposure and risks. Again, in 2009, the SAB reviewed and supported our updated and expanded air toxics risk assessment methods, including our multipathway assessment, refinement of acute risk screening, and the methods of assessing

potential environmental risk. We will continue to seek SAB consultation as our risk assessment methods develop and revise our approach as appropriate.

The ingestion rate of 373 g/day is designed to focus on characterizing risk for the group likely to experience the greatest attributable mercury risk (*i.e.*, subsistence fishers active at inland freshwater watersheds). Specifically, within that subsistence fisher population, the EPA is interested in those individuals who are most at-risk, which includes those who consume the most fish. The default adult fish ingestion rate selected for use in the EPA's RTR multipathway screening methodology of 373 g/day, is based upon an estimated 99th percentile of fish ingestion rates for woman fishers.<sup>50</sup> Thus, although the fish ingestion rate for this group of subsistence fishers is not the highest fish ingestion rate available for use by the EPA, it strikes the appropriate balance between being health protective and having screening scenarios so overly conservative that they are of limited use in the decision-making process. This high-end fish ingestion rate is appropriate in the context of the conservative screening scenario used in the RTR process. This methodology is particularly applicable for national rulemakings given that it is very likely that subsistence woman fishers of child bearing age are located throughout the U.S. Finally, we note that using a high-end subsistence fish ingestion rate is consistent with section 112 of the CAA, which focuses on risks associated with maximally exposed individuals.

The screening methodologies adopted for the multipathway program are periodically evaluated to stay current based upon peer-reviewed scientific studies and surveys focusing on U.S. fish consumption rates. This consumption rate was applied in the data presented in the Mercury Risk Technical Support Document for the Mercury Air Toxics rule, and was supported by the SAB as being generally reasonable and appropriate given the available data.

We appreciate the commenter's support of the approach and rationale of evaluating potential risks associated with lead compounds. In evaluating the potential multipathway risks from emissions of lead compounds, rather than developing a screening emission rate for them, we compared maximum estimated chronic atmospheric concentrations with the current NAAQS for lead. We consider values below the level of the primary NAAQS to protect against multipathway risks because it is set as to protect public health with an adequate margin of safety.

**2.2.2-02 Comment:** Commenter 0173 stated that the EPA's multipathway risk assessment is incomplete and underestimates risks. The commenter supported performing a multipathway (*i.e.*, non-inhalation-based) risk assessment but stated that the EPA's multipathway analysis is deficient and could be improved by incorporating the following suggestions:

- The EPA must perform a multipathway risk assessment on "allowable" emissions, not just "actual" emissions.
- The EPA must assess the non-inhalation-based risk created by pulp mills' emissions of all PB-HAP, instead of restricting its multipathway risk screening assessment to the 14 contaminants identified in the 2004 Risk Assessment Guidance<sup>51</sup> as PB-HAP. The

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<sup>50</sup> Burger, J. 2002. "Daily consumption of wild fish and game: Exposures of high end recreationalists." *Environmental Health Research*. 12(4):343-354.

<sup>51</sup> U.S. EPA, *Air Toxics Risk Assessment Reference Library*. Vol. 1 Tech. Resource Manual. 2004. [https://www.epa.gov/sites/production/files/2013-08/documents/volume\\_1\\_reflibrary.pdf](https://www.epa.gov/sites/production/files/2013-08/documents/volume_1_reflibrary.pdf).

commenter specifically recommended that other toxic metals be included in the assessment, including Cr VI and nickel. The commenter asserted that these pollutants have been shown to have a significant potential for deposition and retention within the environment and present a risk to nearby communities. The commenter cited the California OEHHA 2012 Guidelines for Exposure Assessment as the rationale for including these HAP in the assessment and recommended that the EPA review and adopt the methods in these guidance documents. In addition to the six metals listed by OEHHA, the commenter stated that manganese is a pollutant to which children are particularly vulnerable, and there is evidence that it can pose a multipathway risk due to elevated levels in soils around major emission sources.<sup>52</sup> The commenter also stated that naphthalene has been demonstrated to be persistent and bioaccumulative and is a PAH, and as such must be considered in the POM category which is already listed as a PB-HAP. The commenter also stated that the EPA has given no lawful or rational basis for failing to assess the risk from multipathway exposure to hexachlorobenzene, despite the fact that the EPA has recognized this chemical as a “probable human carcinogen” since 1986, and carcinogens generally have no safe level of human exposure<sup>53</sup> and IRIS has a chronic non-cancer risk value based on ingestion exposure, indicating the potential for non-inhalation risk.<sup>54</sup>

- The EPA must perform a proper multipathway assessment for lead in lieu of a reference value for multipathway risk rather than comparing the emissions to the NAAQS for lead (0.15 µg/m<sup>3</sup>).
- Consistent with the 2004 guidance document and OEHHA 2012 Guidelines, the EPA must recognize the deposition of persistent HAP as a source of soil contamination presenting a potentially significant route of exposure, particularly for children. The commenter argued that the EPA has been relying on outdated estimates of incidental soil ingestion exposures and the Agency must update these values to ensure that it considers the urban child scenario in its multipathway risk assessment.<sup>55</sup> The risk assessment of exposure to soil contaminants should evaluate both direct exposure, hand-to-mouth, and indirect, object-to-mouth exposure as a study has found a statistically significant positive

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<sup>52</sup> See, e.g., ATSDR, *Draft Toxicological Profile for Manganese* at 12, *supra* n. 42 (“Manganese concentrations in soil may be elevated when the soil is in close proximity to a mining source or industry using manganese and may therefore pose a risk of excess exposure to children who ingest contaminated soil.”); see also CalEPA, *Development of Health Criteria for School Site Risk Assessment Pursuant to Health and Safety Code Section 901(g): Child-Specific Reference Doses (chRDs) for School Site Risk Assessment: Manganese and Pentachlorophenol* at 10 (June 2006) (discussing science showing that manganese can accumulate in the brain and showing that ingestion of high levels of manganese is associated with harm).

<sup>53</sup> U.S. EPA. IRIS. [https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance\\_nmbr=374](https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=374).

<sup>54</sup> *Id.*

<sup>55</sup> As an additional problem, California's lead in soil standard is more stringent than the EPA's due to more recent science on the harm of lead exposure. The EPA has recognized that its standard is based on outdated information about lead, that previously assumed children's blood-lead levels below 10.0 µg/dL was safe. The EPA now admits that number is not protective, but has not updated its soil standard. See, e.g., “EPA fails to revise key lead-poisoning hazard standards,” *USA Today* (Mar. 10, 2013), <http://www.usatoday.com/story/news/nation/2013/03/10/epa-has-not-revised-lead-hazard-standards-for-dust-and-soil/1971209> (“The EPA has not revised key hazard standards that protect children from lead poisoning since 2001, despite science showing harms at far lower levels of exposure than previously believed.”); Children's Health Advisory Protection Comm., Letter to Administrator Jackson Regarding Childhood Lead Poisoning (Mar. 29, 2012), [https://www.epa.gov/sites/production/files/2015-10/documents/chpac\\_lead\\_letter\\_2012\\_03\\_29.pdf](https://www.epa.gov/sites/production/files/2015-10/documents/chpac_lead_letter_2012_03_29.pdf).

correlation between the frequency of object or food in mouth activity and blood lead levels, according to the commenter.<sup>56</sup> The commenter added that the 2011 update to the EPA's Exposure Factors Handbook includes more recent studies and estimates of hand-to-mouth behavior, which must be used to assess risks from exposures to contaminated soils.<sup>57</sup>

- The EPA must account for the aggregate impact of inhalation and multipathway cancer and chronic non-cancer risk by adding each type of similar risk together for all pollutants. The commenter stated that the purpose of the multipathway assessment is to allow the EPA to look at a person's exposure overall - not just inhalation or other exposure pathways, in isolation. According to the commenter, failing to add up each type of risk in order to come up with a total cancer risk number and a total non-cancer number, and then a cumulative burden metric, makes the EPA's overall risk assessment incomplete.

**Response:** Regarding the commenter's assertion that we did not base the multipathway risk assessment on allowable emissions, we consider it reasonable for the multipathway risk assessment to be based on actual emissions for this source category, and not the allowable level of emissions. Allowable multipliers for this source category were estimates developed based on the procedures discussed in the memorandum titled *Preparation of Residual Risk Modeling Input File for Subpart MM* in the docket for this rulemaking. These multipliers were developed using engineering judgment based on readily available information for the source category and result in additional uncertainty compared to our estimates of actual emissions. The conservative assumptions associated with the multipathway screening assessment, along with uncertainties in the allowable emissions estimates, could increase uncertainty in this multipathway risk assessment.

Naphthalene is not treated as a POM chemical in the multipathway analyses. Naphthalene is listed individually as a HAP under section 112(b) of the CAA. POM is also listed as a HAP under section 112(b) and is defined as organic compounds with more than one benzene ring and a boiling point greater than or equal to 100 degrees Celsius. Under this definition, naphthalene potentially could be considered as part of the POM listing. However, naphthalene is short-lived in environmental media due to its tendency to volatilize and biodegrade and, consequently, will not build up in environmental media over time. It has a moderate affinity for lipids and will undergo short-term bioaccumulation in tissues; however, biochemical processes lead to its biodegradation and elimination. Because it is neither persistent nor bioaccumulative, we do not consider it a PB-HAP, and its inclusion as POM is inappropriate and would result in less accurate and less meaningful estimates of media concentrations and multipathway risk.

While we acknowledge that we do not have screening values for some of the PB-HAP, we do not agree that this results in an inadequate multipathway assessment. In the Air Toxics Risk Assessment Reference Library, we developed the current PB-HAP list considering all of the available information on persistence and bioaccumulation (see <http://www2.epa.gov/fera/air-toxics-risk-assessment-reference-library-volumes-1-3>), specifically Volume 1, Appendix D).

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<sup>56</sup> Ko, S., Schaefer *et al.*, "Relationships of Video Assessments of Touching and Mouthing Behaviors During Outdoor Play in Urban Residential Yards to Parental Perceptions of Child Behaviors and Blood Lead Levels," *J. of Exposure Science and Environ. Epidemiology* 17:47 (2007).

<sup>57</sup> See U.S. EPA, *Exposure Factors Handbook*, 2011 Edition (<http://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=236252>).

This list considered HAP identified as PB-HAP by other EPA Program Offices (*e.g.*, the Great Waters Program), as well as information from the persistent, bioaccumulative and toxic (PBT) profiler (see <http://www.pbtprofiler.net/>). This list was peer-reviewed by the SAB and found to be reasonable for use in the RTR program. Based on these sources and the available information on the persistence and bioaccumulation of other HAP, we do not anticipate the potential for multipathway risk from other HAP rises to the level of the PB-HAP currently on the list.

We have combined risk assessment results to the extent that it is appropriate to do so. We consider the effect of mixtures of carcinogens and use a target organ-specific hazard index (TOSHI) approach for our chronic noncancer assessments. We do not use a TOSHI approach for our acute analyses nor do we combine the results of our inhalation and multipathway assessments. The multipathway risk assessment conducted for proposal was a screening-level assessment. The screening assessment used highly conservative assumptions designed to ensure that facilities with results below the screening threshold values did not have the potential for multipathway impacts of concern. The screening scenario is a hypothetical scenario, and due to the theoretical construct of the screening model, exceedances of the thresholds are not directly translatable into estimates of risk or HQs for these facilities. In situations where we have previously summed the inhalation and multipathway assessment results (*e.g.*, secondary lead smelters), it was for two refined assessments, and still serves as a conservative overestimate of potential risks given that it is highly unlikely that the same receptor has the maximum results in both assessments.

Regarding incidental soil contamination, the EPA has estimated risks from both direct and indirect pathways. Direct routes of exposure include direct ingestion of soil and exposure through dermal contact. However, because it has been demonstrated in past analyses that exposure levels associated with dermal contact are but a small fraction of exposure levels associated with ingestion and inhalation pathways, dermal exposures were not assessed for this source category.

**2.2.2-05 Comment:** Commenter 0173 stated that the EPA should perform an actual health risk assessment for lead pursuant to section 112(f)(2), rather than consider only the 2008 lead NAAQS. The commenter stated that the EPA must address and incorporate the best currently available information on children's exposure, including the Children's Health Protection Advisory Committee (CHPAC) recommendation<sup>58</sup> of lowering the lead standards to 0.02  $\mu\text{g}/\text{m}^3$  from the current EPA NAAQS level of 0.15  $\mu\text{g}/\text{m}^3$ . According to the commenter, the Centers for Disease Control and Prevention (CDC) has now recognized that there is no safe level of exposure, and has replaced the now outdated 10 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ) standard with a recognition that action is required at the reference level of 5  $\mu\text{g}/\text{dL}$ .<sup>59</sup>

The commenter concluded that, because the EPA relies on the lead NAAQS in its proposed residual risk rule, the EPA has not met the legal standard of section 112(f)(2), noting that the residual risk standards are designed to do more than just replicate other statutory protections, such as those provided by the NAAQS. The commenter argued that, if Congress had

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<sup>58</sup> Marty, M. Chair, Children's Health Protection Advisory Comm.. Letter to Administrator S. Johnson, (June 16, 2008), <http://www2.epa.gov/sites/production/files/2014-05/documents/61608.pdf>

<sup>59</sup> See CDC, *What do Parents Need to Know to Protect Their Children?*, [http://www.cdc.gov/nceh/lead/acclpp/blood\\_lead\\_levels.htm](http://www.cdc.gov/nceh/lead/acclpp/blood_lead_levels.htm)



intended the EPA simply to replicate the NAAQS or some other different CAA requirement in its section 112(f)(2) residual risk rulemaking, the section 112(f)(2) requirement would become redundant for any HAP that also has any relationship to any other regulated pollutant. Furthermore, according to the commenter, for any ambiguity on this question, statutory construction requires a reading of section 112(f)(2) that preserves its independent value and meaning.

**Response:** We disagree with the comment that the use of the lead NAAQS does not sufficiently protect children. While recognizing that lead has been demonstrated to exert “a broad array of deleterious effects on multiple organ systems,” the lead NAAQS targets the effects associated with relatively lower exposures and associated blood lead levels, specifically nervous system effects in children including cognitive and neurobehavioral effects (73 FR 66976). The EPA establishes the NAAQS at a level to protect sensitive sub-populations, such as children and pregnant women. The 2008 decision on the lead NAAQS was informed by an evidence-based framework for neurocognitive effects in young children. In applying the evidence-based framework, we focused on a subpopulation of U.S. children, those living near air sources and more likely to be exposed at the level of the standard; to the same effect see 73 FR 67000/3-- “The framework in effect focuses on the sensitive subpopulation that is the group of children living near sources and more likely to be exposed at the level of the standard. The evidence-based framework estimates a mean air-related intelligence quotient (IQ) loss for this subpopulation of children; it does not estimate a mean for all U.S. children”; 73 FR 67005/1-- “the air-related IQ loss framework provides estimates for the mean air-related IQ loss of a subset of the population of U.S. children, and there are uncertainties associated with those estimates. It provides estimates for that subset of children likely to be exposed to the level of the standard, which is generally expected to be the subpopulation of children living near sources who are likely to be most highly exposed.” In addition, in reviewing and sustaining the lead primary NAAQS, we note that the D.C. Circuit specifically noted that the rule was targeted to protect children living near lead sources: “EPA explained that the scientific evidence showing the impact of lead exposure in young children in the United States led it ‘to give greater prominence to children as the sensitive subpopulation in this review’ and to focus its revision of the lead NAAQS on the ‘sensitive subpopulation that is the group of children living near [lead emission] sources and more likely to be exposed at the level of the standard.’ Given the scientific evidence on which it relied, the EPA’s decision to base the revised lead NAAQS on protecting the subset of children likely to be exposed to airborne lead at the level of the standard was not arbitrary or capricious.” *Coalition of Battery Recyclers*, 604 F. 3d at 618.

As noted in the risk assessment document, there is no RfD or other comparable chronic health benchmark value for lead compounds. In 1988, the EPA’s IRIS program reviewed the health effects data regarding lead and its inorganic compounds and determined that it would be inappropriate to develop an RfD for these compounds, stating:

A great deal of information on the health effects of lead has been obtained through decades of medical observation and scientific research. This information has been assessed in the development of air and water quality criteria by the Agency’s Office of Health and Environmental Assessment (OHEA) in support of regulatory decision-making by the Office of Air Quality Planning and Standards (OAQPS) and by the Office of Drinking Water (ODW). By comparison to most other environmental toxicants, the

degree of uncertainty about the health effects of lead is quite low. It appears that some of these effects, particularly changes in the levels of certain blood enzymes and in aspects of children's neurobehavioral development, may occur at blood lead levels so low as to be essentially without a threshold. The Agency's RfD Work Group discussed inorganic lead (and lead compounds) at two meetings (07/08/1985 and 07/22/1985) and considered it inappropriate to develop an RfD for inorganic lead.

The EPA's IRIS assessment for lead and compounds (inorganic) (c 7439-92-1) can be found at <http://www.epa.gov/iris/subst/0277.htm>.

With regard to the information identified by the commenter, much of this information was similar to information available at the time of the 2008 NAAQS decision. For example, in 2005, the CDC recognized the evidence of adverse health effects in children with blood lead levels below 10 µg/dL, and that there is no safe level of blood lead in young children.<sup>60</sup> The commenter also cites a benchmark analysis by CalEPA that was completed during the time of the last lead NAAQS review.<sup>61</sup> The quantitative relationship from this analysis is a correlation of 1 IQ point change with a 1.0 µg/dL change in blood lead is actually a substantially smaller change in IQ per µg/dL blood lead than the slope of 1.75 IQ points per µg/dL blood lead used in the evidence-based framework that the Administrator relied upon in his 2008 decision on a revised level for the lead NAAQS in 2008 (73 FR 66964). Regarding the CHPAC, a recommendation on the level and averaging time for the revised NAAQS referenced by the commenter was made to the EPA in January of this year in the context of the current NAAQS review and the same comment was made and considered in the 2008 review, that concluded with the current lead NAAQS.

The commenter also makes the legal argument that the primary NAAQS provides an "adequate" margin of safety, but that section 112(f)(2) requires that a residual risk standard provide an "ample" margin of safety, reasoning from this that a NAAQS cannot just substitute as the measure for evaluating acceptability of risk and that some greater level of protection is required. We do not accept the commenter's argument. The EPA is considering the primary NAAQS for lead -- which incorporates an adequate margin of safety -- in determining whether risks (taken together with cancer and other non-cancer health risks) from air-borne lead from petroleum refinery facilities are acceptable or unacceptable. Thus, to the extent the commenter's argument rests on the difference between "adequate" and "ample" margin of safety, the argument is misplaced. Margin-of-safety determinations for this rule are conducted separately, in accord with the two-step framework set forth in the Benzene NESHAP and the *en banc* opinion in *Vinyl Chloride*. See *not only Vinyl Chloride*, 824 F. 2d at 1165, 1166 but *Natural Resources Defense Council (NRDC) v. EPA*, 902 F. 2d 962, 973-74 (D.C. Cir. 1990) (distinguishing the NAAQS process, whereby the margin of safety analysis is incorporated as part of the standard without a

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<sup>60</sup> CDC (2005), *Preventing Lead Poisoning in Young Children: A Statement by the Centers for Disease Control and Prevention*. August 2005. <https://www.cdc.gov/nceh/lead/publications/prevleadpoisoning.pdf>.

<sup>61</sup> Carlisle, J. and K. Dowling. *Development of health criteria for school site risk assessment pursuant to health and safety code section 901(g): Child-specific benchmark change in blood lead concentration for school site risk assessment*. Final Report. Sacramento: Integrated Assessment Branch, Office of Environmental Health Hazard Assessment, California EPA. April 2007.

two-step analysis, from residual risk determinations).<sup>62</sup> Using that framework, with its consideration of costs, cost effectiveness, technological feasibility, and other factors set out in the Benzene NESHAP, at proposal we did not identify any additional controls beyond those that would need to be implemented to ensure an acceptable level of risk with an AMOS. The EPA thus disagrees with the commenter that section 112(f)(2) standards must be more stringent than a primary NAAQS as a matter of law.

### 2.2.3 Cumulative Risk Assessment

**2.2.3-01 Comment:** Commenter 0173 argued that the EPA must assess the combined impact of multiple pollutants. The commenter stated that this assessment should evaluate the combined impact of each type of risk from multiple pollutants and assess the total cumulative risk burden from all pollutants to make an AMOS determination. The commenter noted that in the pulp mills risk assessment, the EPA only assesses the combined impact of cancer risk and chronic non-cancer risk that operates on the same target organ, while the commenter argued that the EPA should assess the total and synergistic cancer risk and total chronic noncancer risk for different pollutants. In addition, the commenter noted that the EPA should apply these same principles to create a mechanism for assessing the total acute risk to chemical mixtures, such as the TOSHI for chronic risk that aggregates the acute impacts on the same organ systems for all pollutants.

Commenter 0173 asserted that, consistent with NAS recommendations, the EPA must create a metric to assess the total and cumulative risk burden, rather than only looking at each type of risk separately. After first assessing the total cancer, chronic non-cancer, and acute risks, for both inhalation and multipathway exposure, the commenter argued that the EPA also must create a metric to assess the total risk. The EPA must aggregate health risk for each pollutant, and each type of health risk, according to the commenter, to create a cumulative risk determination for the individual “most exposed” to emissions as section 112(f)(2) of the CAA requires. The commenter asserted that without performing this cumulative assessment, the EPA has failed to gather the information needed to assess whether the risk to public health is acceptable under section 112(f)(2).

**Response:** We have combined risk assessment results to the extent that it is appropriate to do so. We consider the effect of mixtures of carcinogens and use a TOSHI approach for our chronic noncancer assessments. We do not use a TOSHI approach for our acute analyses, nor do we combine the results of our inhalation and multipathway assessments.

For the subpart MM source category, the EPA conducted an assessment of the cumulative cancer risks from emitted carcinogens and the cumulative noncancer hazard indices from all emitted non-carcinogens affecting the same target organ system for both the source category emissions and the facility-wide emissions.

Concerning comments that we should consider aggregate risks from multiple pollutants and sources, we note that we have done this to the extent it is appropriate to do so. We modeled whole-facility risks for both chronic cancer and non-cancer impacts to understand the risk

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<sup>62</sup> The Court was referring to the predecessor provision to the current section 112(f), but its analysis is equally applicable to the revised provision.

contribution of the sources within the subpart MM source category. The individual cancer risks for the source category were aggregated for all carcinogens. In assessing noncancer hazard from chronic exposures for pollutants that have similar modes of action or (where this information is absent) that affect the same target organ, we aggregated the HQs. This process creates, for each target organ, a TOSHI, defined as the sum of the HQs for individual HAP that affect the same organ or organ system. Facility-wide risks were estimated based on the 2011 ICR data and subsequent updates/revisions obtained from facilities, which included emissions from all sources at the mill, not just subpart MM chemical recovery combustion sources (e.g., emissions were included for pulping and paper production processes and industrial boilers present at the mill, which are regulated under separate NESHAP).

As described in the *Residual Risk Assessment for Pulp Mill Combustion Sources in Support of the December 2016 Risk and Technology Review Proposed Rule* (Docket Item No. EPA-HQ-OAR-2014-0741-0152) and the *Residual Risk Assessment for Pulp Mill Combustion Sources in Support of the October 2017 Risk and Technology Review Final Rule*, we do not sum results of the acute noncancer inhalation assessment to create a combined acute risk number that would represent the total acute risk for all pollutants that act in a similar way on the same organ system or systems (similar to the chronic TOSHI). The worst-case acute screen is a conservative scenario. That is, the acute screening scenario assumes worst-case meteorology, peak emissions for all emission points occurring concurrently and an individual being located at the site of maximum concentration for an hour. Thus, as noted in Section 2.8.2 of the *Residual Risk Assessment for Pulp Mill Combustion Sources in Support of the December 2016 Risk and Technology Review Proposed Rule* (Docket Item No. EPA-HQ-OAR-2014-0741-0152) and the *Residual Risk Assessment for Pulp Mill Combustion Sources in Support of the October 2017 Risk and Technology Review Final Rule*, “because of the conservative nature of the acute inhalation screening and the variable nature of emissions and potential exposures, acute impacts were screened on an individual pollutant basis, not using the TOSHI approach.”

We did not combine the inhalation and multipathway risk assessment results for each pollutant because it is inappropriate to do so. The multipathway risk assessment conducted for proposal was a screening-level assessment. The screening assessment used highly conservative assumptions designed to ensure that facilities with results below the screening threshold values did not have the potential for multipathway impacts of concern. The screening scenario is a hypothetical scenario, and due to the theoretical construct of the screening model, exceedances of the thresholds are not directly translatable into estimates of risk or HQs for these facilities. For the refined multipathway analysis, it is unlikely that the person with the highest chronic inhalation cancer risk is also the same person with the highest individual multipathway cancer risk.

**2.2.3-02 Comment:** Commenter 0173 stated that the EPA must assess and account for the cumulative impact and risk caused by exposure to multiple source categories’ toxic air emissions. The commenter asserted that, in addition to performing a cumulative assessment from nearby pulp mills alone, the EPA must perform a cumulative analysis which aggregates or adds the emissions for the most-exposed communities coming from: (1) the source category (including all individual sources within it); (2) facility-wide risk from collocated sources outside

of this category; and (3) all other sources of toxic air pollution in the area.<sup>63</sup> As an example, the commenter pointed to sources in the Hopewell, Virginia and Macon, Georgia communities, which are exposed to at least seven and five major sources, respectively.<sup>64</sup> The commenter noted that the EPA has recognized this need in its recent risk report,<sup>65</sup> yet has failed to propose any changes to the emissions standards based on the combined exposure with any other sources. In support of their argument, the commenter also cited recommendations from the SAB and NAS which called for the incorporation of cumulative health risk into its residual risk analysis.

Commenter 0173 also noted that the EPA has not used its calculated “facility-wide” risk for collocated sources to set standards, and it has ignored different sources across the street or in close proximity in its draft risk assessment. In addition, the commenter claimed that the EPA has provided no information on how it reached the “facility-wide” risk number. The commenter also claimed that the EPA should have evaluated facility-wide risk based on “allowable” emissions, and if it did, this would likely increase the risks found.

Commenter 0173 recommended that the EPA use the risk assessment results available for those source categories for which it has already performed a risk assessment review - such as those covered by the hazardous organic NESHAP and other sources that are frequently located near pulp mills in its cumulative risk assessment. According to the commenter, the combined risk results for these sources near one another (not just collocated) would likely have higher overall risk than has been estimated for the most-exposed person near a pulp mill, and therefore stronger standards are needed under section 112(f)(2) for these sources. Finally, the commenter suggested that the EPA consider the existing research regarding health risk from toxic air pollution in urban communities nationwide<sup>66</sup> as well as the OEHHA cumulative assessment approach and apply a similar science-based approach in this residual risk assessment.<sup>67</sup>

In addition, commenter 0173 noted that the NAS has recommended that the EPA evaluate “background exposures and vulnerability factors,” as well as use “epidemiologic and toxicologic

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<sup>63</sup> The commenter supported the EPA's recognition of the need to assess whether the maximum exposed individual is exposed to emissions from more than one source within each source category. The commenter also appreciated that the EPA had considered facility-wide risk in some way in this rulemaking. However, according to the commenter, those assessments offer only part of the picture. And, even on both of these issues, the commenter stated that the EPA has provided very little information about what it included in such assessments, as discussed elsewhere in their comments. The commenter asserted that the EPA just stated numbers found for facility-wide risk, without explaining where those numbers came from, how they were calculated, or what emission sources they covered.

<sup>64</sup> See U.S. EPA, ECHO Facility Search Results, <https://echo.epa.gov/facilities/facility-search/results> (using search terms “Hopewell, VA” & “Macon, GA”)

<sup>65</sup> See U.S. EPA, *Concepts, Methods and Data Sources*, *supra*, at xxxii (defining a cumulative risk assessment as including “aggregate exposures by multiple pathways, media and routes over time, plus combined exposures to multiple contaminants from multiple sources”). Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 64.

<sup>66</sup> See, e.g., Morello-Frosch, R. and B. Jesdale, “Separate and Unequal: Residential Segregation and Estimated Cancer Risks Associated with Ambient Air Toxics in U.S. Metropolitan Areas,” *Envtl. Health Perspectives* 114(3):386 (2006) (assessing toxic air pollution cancer risk for 309 metropolitan areas encompassing 45,710 tracts); “National Air Toxics Program: The Integrated Urban Strategy,” 64 FR 38706, 38738 (July 19, 1999).

<sup>67</sup> See, e.g., CalEPA, “Cumulative Impacts,” *supra*. Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 33.

evidence” in its risk assessments.<sup>68</sup> Rather than separating an environmental justice (EJ) analysis and considerations of inequality from the risk assessment, considering these factors as part of the cumulative risk assessment - because of the increased vulnerability created - would be a more effective, meaningful, and scientific approach, according to the commenter. The commenter asserted that, in assessing a source category’s emission contributions in affected communities and considering whether these contributions cause the most-exposed people to experience an unacceptable level of public health risk when combined with the existing baseline from past emissions, other HAP emissions, and the community’s health status, the EPA can describe and manage uncertainties, similar to many other analyses.<sup>69</sup>

Commenter 0173 concluded that until the EPA develops a data-driven approach to comprehensively model cumulative risk or impacts from multiple sources, the EPA must incorporate a default uncertainty factor to adjust the degree to which each individual source category is contributing to the total risk experienced by the most-exposed individuals. For example, according to the commenter, for a source category in an area with up to 10 other HAP-emitting facilities, this default uncertainty factor should equal at least 10, consistent with the common scientific use of this factor for other kinds of vulnerability.<sup>70</sup> This commenter suggested that wherever there is a history of other exposures or other source categories, the “unacceptable” level of cancer, non-cancer chronic, and acute risk from the source category must be adjusted downward (such that no single source category could constitute all acceptable risk, when the most-exposed person is exposed to many other source categories).

**Response:** We disagree with the claim that additional quantitative assessment of risks from sources outside the source category is required under the statute. Section 112(f) requires the EPA to perform a review of whether there is risk remaining from emissions from a source category after promulgation of the technology-based MACT standards for that source category. To this end, the EPA conducts a comprehensive assessment of the risks associated with exposure to the HAP emitted by the source category and supplements that with additional information that is available about other possible concurrent and relevant risks. While the incorporation of additional background concentrations from the environment in our risk assessments (including

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<sup>68</sup> See NAS (2009), *supra* note 264, at 221-23 (discussing Menzie *et al.* 2007 model); *id.* at 230 (discussing the role of epidemiology and surveillance data).

<sup>69</sup> See, e.g., 42 U.S.C. 7475(a)(3), 7503(a)(1) (requiring a localized, cumulative assessment of whether or not a new or modified source's additional emissions will cause an attainment area to deteriorate, or will make it difficult for a nonattainment area to make progress toward achieving the national ambient air quality standards); *New York v. EPA*, 443 F.3d 880, 883 n.1 (D.C. Cir. 2006) (citing *New York v. EPA*, 413 F.3d 3, 11-14 (D.C. Cir. 2005)); see also 40 CFR 1508.27(b)(7) (requiring a consideration of “[w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts”); see also 40 CFR 1508.7; *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 930 (9th Cir. 2008) (applying 16 U.S.C. 1536(a)(2) to enforce the Endangered Species Act duty to ensure against jeopardy which includes the requirement to assess a newly proposed action in the context of all other impacts, and determine whether or not the specific action will “tip a species from a state of precarious survival into a state of likely extinction,” or, where baseline conditions already jeopardize a species, whether it will “deepen[] the jeopardy by causing additional harm”).

<sup>70</sup> For areas with more facilities, which cause an even greater level of health risk combined, the uncertainty factor should be adjusted accordingly, *i.e.*, 11-20 facilities would result in an uncertainty factor of 20, and more than 20 would result in an uncertainty factor of 100, so the source category's contribution is no higher than 1/100 of the threshold.

those from mobile sources and other industrial and area sources) could be technically challenging, they are neither mandated nor barred from our analysis. In developing the decision framework in the Benzene NESHAP currently used for making residual risk decisions, the EPA rejected approaches that would have mandated consideration of background levels of pollution in assessing the acceptability of risk, concluding that comparison of acceptable risk should not be associated with levels in polluted urban air, (54 FR 38044, 38061, September 14, 1989). Although the EPA rejected such approaches for considering the acceptable level of risk, the EPA recognized in the Benzene NESHAP that background levels (including natural background) could be considered as part of the EPA's AMOS analysis, as appropriate and as available, along with other factors, such as cost and technical feasibility.

For the subpart MM source category, the EPA conducted an assessment of the cumulative cancer risks from emitted carcinogens and the cumulative noncancer hazard indices from all emitted non-carcinogens affecting the same target organ system for both the source category emissions and the facility-wide emissions. While the emissions for the source category and facility-wide emissions have been collected as part of the information data request and reviewed by project engineers and scientists, emissions data for sources outside of pulp mills are not readily available at the level of detail and quality that is required for a refined risks analysis. Thus, because of uncertainties in this data we do not include the risks from stationary and mobile sources outside of pulp mills in our facility-wide risk analysis. We also disagree that allowable emissions should be used in the facility-wide risk analysis instead of actuals. The uncertainties associated with allowable emissions estimates would make the inhalation risk assessment based on allowable emissions highly uncertain.

The risk assessment modeling for the subpart MM MACT accounted for the effects of multiple facilities within the source category that may be in close proximity when estimating concentration and risk impacts at each block centroid. When evaluating the risks associated with a particular source category we combined the impacts of all facilities within the same source category, and assessed chronic exposure and risk for all census blocks with at least one resident (*i.e.*, locations where people may reasonably be assumed to reside rather than receptor points at the fence-line of a facility). The MIR considers the combined impacts of all sources in the category that may be in close proximity. We do not agree with the idea that we should apply an uncertainty factor related to the number of non-pulp mills near a pulp mill.

**2.2.3-03 Comment:** Commenter 0173 stated that pulp mills emit large quantities of other pollutants, including criteria pollutants that can negatively interact with and exacerbate the impacts of HAP exposure. The commenter referenced PM with particles less than 2.5 micrometers in diameter (PM<sub>2.5</sub>) and hydrogen sulfide (H<sub>2</sub>S) emissions and specifically stated that H<sub>2</sub>S can cause irritation to the eyes, nose, and throat.

**Response:** This rulemaking assesses the risks associated with HAP listed in CAA section 112. Under CAA section 112(b)(2), criteria pollutants may not be listed as HAP under CAA section 112. Further, CAA section 112(f)(2)(A) provides that the risk assessment is made with respect to the HAP standards under CAA section 112(d) to determine if those standards provide an AMOS to protect public health and prevent adverse environmental effects. Thus, the risk assessment done under CAA section 112(f)(2) is properly limited to the risks from HAP emissions. Moreover, the commenter here simply makes the hypothetical statement that criteria

pollutants “can” negatively interact with and exacerbate the impacts of HAP exposure, but does not provide any information or analysis showing that they actually do or otherwise showing that including criteria pollutant emissions in the risk assessment here would be an appropriate inquiry.

## 2.3 Risk Assessment Results

**2.3-01 Comment:** Commenter 0168 noted they have reviewed the residual human health and ecological risk assessment that the EPA conducted for emission sources associated with facilities subject to subpart MM throughout the U.S.<sup>71</sup> The commenter noted that the methods that the EPA applied were consistent with evaluations of residual risk that it has conducted for other MACT standards. The commenter stated that their review confirms that the EPA applied available information on HAP emission sources, made conservative assumptions to account for unresolved uncertainty of various parameters, evaluated risk using health-protective dose-response information, and characterized the modeled risk consistent with the EPA’s longstanding interpretation of significance.

Multiple commenters (0164, 0168, 0171) stated that the residual risk assessment fully and comprehensively supports the EPA’s finding that the residual risks from this source category are acceptable, and no additional emissions reductions are necessary to provide an AMOS as required by law. The commenters stated that the EPA’s residual risk assessment for pulp and paper mills demonstrates that HAP emissions do not pose significant human health or environmental risk.

**Response:** We acknowledge these comments and are finalizing the conclusion that the residual risk assessment for pulp mill combustion sources demonstrates that the current standards provide an ample margin of safety to protect public health and prevent adverse environmental effects.

**2.3-02 Comment:** Commenter 0173 stated that the EPA should decide that the health risks under the existing pulp mills standards are unacceptable and set residual risk standards to reduce those risks. The commenter noted that the EPA proposed that the health risks it has found are acceptable, even though they are at least 4 times the “aspirational goal” of 1-in-1 million from any given single source category, stated in CAA section 112(f)(2). The commenter also noted that the EPA anticipated approximately 2 additional cancer cases every 100 years from inhalation of pulp mills’ toxic air pollution alone, which the commenter stated should clearly be unacceptable.

According to commenter 0173, the EPA should also find the current health risks to be unacceptable for the following reasons, which have been included in more detail elsewhere in this chapter:

- The EPA has underestimated the cancer risk from inhalation particularly from early exposure. (comment 2.2.1-05)

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<sup>71</sup> U.S. EPA. *Residual Risk Assessment for Pulp Mill Combustion Sources in Support of the December, 2016 Risk and Technology Review Proposed Rule*, EPA’s Office of Air Quality Planning and Standards, December, 2016.



- The EPA has underestimated the cancer risk from multipathway exposure. (comment 2.2.2-02)
- The EPA needs to recognize that the combination of cancer, high chronic non-cancer and acute risks, together, create unacceptable risk. (comment 2.2.3-01)
- The EPA needs to recognize that the cumulative impacts and multiple source exposure from various sources, including pulp mills, mean that allowing pulp mills to cause 4-in-1 million cancer risk, plus the additional risks, is unacceptable. (comment 2.2.3-02)
- The EPA did not evaluate facility-wide risk based on “allowable” emissions, which would likely increase the risks found. (comment 2.2.3-02)
- It is unjust and inconsistent with the CAA’s health protection purpose to allow the high health risks caused by pulp mills to fall disproportionately on communities of color and lower income communities who are least equipped to deal with the resulting health effects. (comment 2.4-01)

**Response:** The EPA disagrees with the commenter. We think we have adequately estimated risks from these sources and that the risks are acceptable. The EPA is finalizing a determination that the risks are acceptable from this source category. As discussed in previous responses, there are many aspects of the risk assessment that commenters disagreed with.

**2.3-03 Comment:** Commenter 0173 stated that the EPA must evaluate research performed on health impacts near pulp mills and that failing to do so is unlawful, arbitrary, and capricious as the EPA must evaluate the best available scientific research documenting any pulp mill emissions’ impact on health threats as part of this rulemaking. The commenter further referred to studies of health impacts to pulp mill workers,<sup>72,73,74,75</sup> a 1976 report studying cancer in pulp mill communities,<sup>76</sup> and a report suggesting more studies be conducted to determine health threats to surrounding neighborhoods.<sup>77</sup>

**Response:** The EPA disagrees with the commenter regarding the use of a literature search related to research performed near pulp mills. The EPA performs a risk assessment, approved by the SAB, to evaluate human health impacts. This risk assessment was performed

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<sup>72</sup> Andersson, E., *et al.*, “Cancer incidence among Swedish pulp and paper mill workers: a cohort study of sulphate and sulphate mills,” *International Archives of Occupational and Environmental Health* 86: 529 (July 2013).

<sup>73</sup> Andersson, E., *et al.*, “Cohort mortality study of Swedish pulp and paper mill workers—nonmalignant diseases,” *Scandinavian Journal of Work, Environment & Health* 33: 470 (Dec. 2007). Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 9.

<sup>74</sup> Persson, B., *et al.*, “Cardiovascular mortality among Swedish pulp and paper mill workers,” *American Journal of Industrial Medicine* 50: 221 (Mar. 2007).

<sup>75</sup> Andersson, E., *et al.*, “Incidence of chronic bronchitis in a cohort of pulp mill workers with repeated gassings to sulphur dioxide and other irritant gases,” *Environmental Health* 12: 1 (Dec. 2013). Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 11.

<sup>76</sup> Blot, W. and J. Fraumeni, Jr, “Geographic Patterns of Lung Cancer: Industrial Correlations,” John Hopkins University School of Hygiene and Public Health, *Am. J. Epidemiol* 103: 539-550, 1976.

<sup>77</sup> Soskolne, C. and L. Sieswerda, *Epidemiological Studies of Communities Near Pulp and Paper Mills in Cancer Risk Associated with Pulp and Paper Mills: A Review of Occupational and Community Epidemiology*, Pub. Health Agency of Canada, Vol. 29 Supp. 2 (2010) available at [http://www.phac-aspc.gc.ca/publicat/hpcdp-pspmc/29-2-sup/ar\\_02-eng.php](http://www.phac-aspc.gc.ca/publicat/hpcdp-pspmc/29-2-sup/ar_02-eng.php).

using the best available emissions data for the sector. The result of this assessment was that risk was acceptable.

With respect to the pulp mill worker health impact studies, health impacts to plant employees are not evaluated in this risk assessment. This risk assessment evaluated risks to humans offsite where people may live or spend time such as a park or a school. The “Geographic Patterns of Lung Cancer: Industrial Correlations” reference refers to studies performed before the original NESHAP was promulgated for this source category. The risk assessment performed for this rulemaking evaluates the original NESHAP’s ability to provide an AMOS.

## 2.4 Demographics

**2.4-01 Comment:** Commenter 0173 stated that the EPA must account for increased vulnerability based on demographic differences, as part of the risk assessment. Consistent with NAS recommendations, the commenter suggested that the EPA should consider the use of socioeconomic factors as part of the EPA’s consideration of both vulnerability and variability, as core elements of the risk assessment. According to the commenter, data describing these factors are available from the CDC’s Environmental Public Health Tracking Program, ATSDR, state and local health agencies, and academic researchers.

Commenter 0173 suggested that the EPA better account for other types of human variability such as genetics and baseline health status, as recommended by NAS and current science. According to the commenter, socioeconomic status has been shown to act as a proxy for other types of human variability to chemical risk that the EPA has not adequately addressed in its draft risk assessment for the subpart MM RTR.

In addition to looking at the demographic census data on race, ethnicity, poverty level, and similar factors, commenter 0173 stated that the EPA must assess the starting point or baseline overall health status of the affected individuals and communities using the best available data at a local and national level, including the baseline cancer levels, respiratory problems, and health problems associated with the toxic chemicals emitted by a source category. The commenter asserted that doing so would be consistent with the 1999 *Residual Risk Report to Congress*<sup>78</sup> and would also follow the EPA’s own statements (in the 2014 *Second Integrated Urban Air Toxics Report*) that more work is needed to reduce excess cancer risks in urban areas that continue to face elevated risks.<sup>79</sup> As an alternative, the commenter suggested that the EPA could use a default factor to account for socioeconomic and other community-based stressors.

Commenter 0173 also suggested that the EPA better communicate and document the findings of the analysis, as one commenter stated, the EPA has presented EJ numbers in the

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<sup>78</sup> U.S. EPA. *Residual Risk Report to Congress* at 42, 67 (Mar. 1999), EPA-453/R-99-00 (discussing factor of “overall health” and recognizing the need to consider sensitive subpopulations that “consist of a specific set of individuals who are particularly susceptible to adverse health effects because of physiological (*e.g.*, age, gender, pre-existing conditions), socioeconomic (*e.g.*, nutrition), or demographic variables, or significantly greater levels of exposure,” based on various demographic factors).

<sup>79</sup> U.S. EPA. *Second Integrated Urban Air Toxics Report*, at xiv. (Aug. 21, 2014), <https://www.epa.gov/sites/production/files/2014-08/documents/082114-urban-air-toxics-reportcongress.pdf>. Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 69.

abstract, which makes it difficult for communities to understand the risk assessment and the EPA's findings.

**Response:** The EPA continues to evaluate and refine EJ analysis, such as the proximity analysis performed for the Definition of Solid Waste. The draft EPA document *Technical Guidance for Assessing Environmental Justice in Regulatory Analysis* is currently undergoing SAB review. The Office of Air and Radiation is a contributor to this draft document and cites numerous examples of EJ analysis performed in agency rulemakings. Environment justice considerations are a part of the rulemaking process; however, various factors influence the scope and complexity of an assessment. These factors may include, but are not limited to statutory mandates, data availability, resources and/or timeframe limitations.

In the *Urban Air Toxics Strategy Report to Congress*, we acknowledge that national rules and standards can address part of the risk to communities, but because the assessments did not include background risks or contributions to risk from sources outside the facilities more needs to be done at the community level with other tools available within the CAA and within state, local, and other federal programs. The EPA is committed to our efforts to make a difference in communities of concern and developing an integrated strategy focusing work in communities with the most need for the EPA's assistance. This effort to enhance coordination across our EPA programs and with other federal agencies will improve how we support community needs. We will focus on those communities where we think we have opportunities to leverage resources and actions to make a real difference. As we learn lessons on coordinating and focusing our efforts, we will use these lessons to help more communities in the future.

**2.4-02 Comment:** Commenter 0173 stated that the EPA must fully integrate the findings of its EJ analysis into this risk assessment and rulemaking and set stronger pollution limits to provide EJ.

**Response:** Under Executive Order (EO) 12898, the EPA is directed to the greatest extent practicable and permitted by law, to make EJ part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low income populations in the U.S. Consistent with EO 12898 and the Presidential Memorandum that accompanies it, the EPA's EJ policies promote justice by focusing attention and EPA efforts on addressing the types of EJ harms and risks that are prevalent among minority, low-income, and indigenous populations. EO 12898 and the EPA's EJ policies do not mandate particular outcomes from an action, but they demand that decisions involving the action be informed by a consideration of EJ issues. With respect to this rule, the EPA found the overall level of risk from the source category to be acceptable and to provide an AMOS for all populations in close proximity to these sources, including minority and low-income populations.

## 3. Technology Review

### 3.1 EPA's Authority Under CAA Section 112(d)(6)

**3.1-01 Comment:** Commenter 0168 stated that the technology review that the EPA conducted for the proposed rule was thorough and within the scope that Congress intended for periodic review of MACT standards under CAA section 112(d)(6). According to the commenter, the EPA's authority under CAA section 112(d)(6) is limited to determining whether "developments in practices, processes, and control technologies" make it "necessary" to revise the standards. The commenter stated that, unlike some other environmental standard-setting, Congress did not give the EPA open-ended instruction to review and reconsider MACT standard every 8 years.

**Response:** We acknowledge the commenter's support for the scope of the technology review performed for the subpart MM proposal under CAA section 112(d)(6). The scope of the technology review in the final rule is the same as the scope in the proposed rule.

### 3.2 Developments in Practices, Processes, and Control Technologies

#### 3.2.1 Emissions Standards

**3.2.1-01 Comment:** Multiple commenters (0164, 0166, 0168, 0169, 0171) agreed with the EPA's conclusion that there have been no advances in practices, processes, or controls since promulgation of subpart MM in 2001. The commenters concurred with the EPA that these results support the conclusion that there should be no changes to the emissions standards.

**Response:** We acknowledge the commenter's support for our proposed conclusions from the technology review and are finalizing the conclusion that there have been no advances in practices, processes or controls since promulgation in 2001 that would justify changes to the emissions standards.

**3.2.1-02 Comment:** Commenter 0173 argued that the EPA has unlawfully and arbitrarily failed to set legally required standards for a number of emission points subject to this rule. The commenter stated that the EPA never met and has not proposed to meet the test applicable to regulate HAP under section 112(d)(2) and (3). The commenter argued that each of the following emissions standards must receive a proper section 112(d)(6) review to evaluate whether there is an emissions standard in place that met the section 112(d)(2) and (3) test; and if not, to set such a standard, for the reasons stated below and as discussed in a report by Bruce Buckheit (attachment 24 to commenter 0173's comment):

- *PM standards at existing and new recovery furnaces.* The EPA previously ignored data available at the time, choosing only long-term data. The EPA has new data illustrating developments and must consider and use this information to set a proper standard that satisfies section 112(d)(2) and (3).
- *PM standards at existing and new smelt dissolving tanks (SDTs).* The EPA previously found it had no data; and chose a single technology instead of meeting the CAA's test.

The EPA has new data illustrating developments and must consider and use this information to set a proper standard that satisfies section 112(d)(2) and (3).

- *PM standards at existing and new lime kilns.* The EPA again chose a preferred technology instead of meeting the CAA's test. The EPA has new data illustrating developments and must consider and use this information to set a proper standard that satisfies section 112(d)(2) and (3).
- *PM standards at existing and new sulfite combustion units.* The EPA again chose a preferred technology instead of meeting the CAA's test. The EPA has new data illustrating developments and must consider and use this information to set a proper standard that satisfies section 112(d)(2) and (3).
- *PM standards at existing and new semichemical combustion units.* The EPA previously found it had no data. The EPA must review and update to ensure there is a floor standard in place.

Commenter 0173 argued that the EPA must set emissions standards on each of the above emission points to satisfy the CAA, by establishing a proper floor for the first time, and performing a beyond-the-floor analysis. The commenter argued that the EPA is not authorized by section 112(d)(6) to leave in place errors made when performing the required review rulemaking.

Commenter 0173 noted that section 112(d)(1) requires the EPA to set emissions standards for all listed source categories of HAP, and every 8 years, section 112(d)(6) requires the EPA to review section 112 standards in full and determine whether it is "necessary" to change those standards. The commenter stated that section 112(d)(6) review is required partly to ensure that the Agency continually revisits the control requirements applicable to every pollutant emitted by a source category, and determine if further regulation is needed. The commenter indicated that the section 112(d)(6) review has brought the problem of inadequately regulated HAP, due to the EPA's failure to set a proper floor standard, to the EPA's attention. The commenter argued that it is now "necessary" under section 112(d)(6) to set emissions standards that control these pollutants, as the CAA directs, and it would be unlawful and arbitrary for the EPA not to do so.

The commenter also noted that developments clarifying the EPA's legal responsibility have occurred since the EPA first set emissions standards for this source category, showing that the EPA must not simply choose a technology, for example,<sup>80</sup> the commenter asserted that, under section 112(d)(6), the D.C. Circuit Court legal decisions governing the EPA's regulatory responsibility are "developments" that define proper pollution controls, practices, and technologies. Thus, the commenter concluded, the EPA is legally required to account for them and set standards to limit these pollutants in the review rulemaking. The commenter argued that section 112(d)(6) does not exempt a rule from the requirement to include emission limits for all HAP, or to ensure that there is a standard in place that has met the requirements of the CAA, including the floor requirements.

Commenter 0173 also argued that because the EPA has never promulgated adequate floor standards for these sources, the EPA may not simply "revise" such standards under section

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<sup>80</sup> See, e.g., *Cement Kiln Recycling Coal. v. EPA*, 255 F.3d 855, 862-866 (DC. Cir. 2001) (holding that agency cannot set standards based on a single technology as a proxy for meeting section 112(d)(3) requirements).

112(d)(6). Instead, the commenter contended that, where there is no such floor standard already in place, the EPA is legally required to follow the statutory test to promulgate such a standard pursuant to section 112(d)(2) and (3) (*i.e.*, “maximum achievable degree of reduction” test, including the floor). In addition, the commenter stated that, even assuming the EPA may consider costs when deciding how to “revise” a standard under section 112(d)(6), the EPA may not use costs as a justification for not setting a proper emissions standard at least once, when it discovers there is no such standard as a result of a section 112(d)(6) review rulemaking.

Commenter 0173 stated that the consideration of cost that D.C. Circuit Court precedent has found to be allowed under section 112(d)(6) only applies to the revision of emissions standards that restrict HAP.<sup>81</sup> According to the commenter, the D.C. Circuit Court has not held that this provision governs the test for promulgation of standards for the first time where there is no HAP restriction in place at all, nor that it allows the EPA to skip the section 112(d)(2) and (3) regulatory stage for a source category and do whatever it likes as a result of a review rulemaking. The commenter stated that section 112(d)(6) contains no test to use to set standards for the first time and does not supplant the test applied in section 112(d)(2) and (3).

According to commenter 0173, in prior section 112(d)(6) rulemakings, the EPA has similarly and repeatedly found developments like the ones described above, and determined that it was necessary to set standards pursuant to section 112(d)(2) and (3) after reviewing the standards under its section 112(d)(6) authority, and that the EPA had a “clear statutory obligation to see emissions standards for each listed HAP.”<sup>82</sup> Thus, the commenter concluded, it would be unlawful and inconsistent with the EPA’s policy and recent practice regarding the need to set limits for unregulated pollutants and sources, but not to set limits here for inadequately regulated emission points.

**Response:** The EPA is required under CAA section 112(d)(6) to periodically review, and revise *as necessary* (taking into account developments in practices, processes, and control technologies), *emissions standards promulgated under section 112(d)*. Particulate matter emissions standards were promulgated under subpart MM for new and existing recovery furnaces, lime kilns, SDTs, and sulfite combustion units in 2001. We disagree with the commenter that implied the EPA must recalculate or reanalyze the validity of MACT floors previously established under CAA sections 112(d)(2) and (3) as part of the technology review under CAA section 112(d)(6). As explained in prior RTR rulemakings, the EPA does not read section 112(d)(6) as requiring a reanalysis or recalculation of MACT floors. *See* National Emissions Standards for Coke Oven Batteries, (70 FR 19992, 20008 (April 15, 2005)). We read section 112(d)(6) as providing the EPA with substantial latitude in weighing a variety of factors and arriving at an appropriate balance in considering revisions to standards promulgated under section 112(d)(2) and (3). Nothing in section 112(d)(6) expressly or implicitly requires that the

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<sup>81</sup> *Association of Battery Recyclers v. EPA*, 716 F.3d 667 (D.C. Cir. 2013).

<sup>82</sup> *See, e.g.*, Wool Fiberglass Final Rule, 80 FR 45,280, 45,311-12 (July 29, 2015) (“Further, CAA section 112(d)(6) itself provides that the agency must review and revise “as necessary.” The “as necessary” language must be read in the context of CAA section 112(d)(6), which focuses on the review of developments that have occurred since the time of the original promulgation of the MACT standard and, thus, can be used as an opportunity to correct flaws that existed at the time of the original promulgation.”); “in several recent rulemakings we have chosen to fix underlying defects in existing MACT standards under CAA sections 112(d)(2) and (3), provisions that directly govern the initial promulgation of MACT standards” (citing examples)).

EPA recalculate the MACT floor as part of the section 112(d)(6) review. The EPA's interpretation on this point has been upheld by the D.C. Circuit. *Nat'l Ass'n for Surface Finishing v. EPA*, 795 F.3d 1, 7-9 (D.C. Cir. 2015); *Ass'n of Battery Recyclers v. EPA*, 716 F.3d 667 (D.C. Cir. 2013); *NRDC v. EPA*, 529 F.3d 1077, 1084 (D.C. Cir. 2008). Further, CAA section 112(d)(6) provides that the "developments" the EPA must take into account when conducting technology reviews are specifically "developments in practices, processes, and control technologies." See 81 FR 79066 (December 30, 2016) (describing the developments the EPA considers when conducting CAA section 112(d)(6) reviews). The EPA interprets the term "developments" to include technological improvements that could result in significant additional emission reduction as well as wholly new methods of emission reduction. See, e.g., 75 FR 65083; see also *Nat'l Ass'n Surface Finishing v. EPA*, 795 F.3d 1, 11 (D.C. Cir. 2015) (upholding the EPA's conclusion that developments include changes that indicate that a previously considered option for reducing emissions may now be cost-effective or technologically feasible and concluding that it is sufficient for the EPA "to assess and discuss the collective impact of the developments it has identified, and to revise standards appropriately in light thereof."). The EPA does not, however, interpret the term "development" as used in CAA section 112(d)(6) to include intervening case law. An intervening decision by a court regarding other CAA section 112 requirements does not constitute a development in a practice, process or control technology. As such, the EPA has no obligation to consider intervening case law as a "development" when identifying developments for purposes of the section 112(d)(6) review.

**3.2.1-03 Comment:** Regarding HAP metals, multiple commenters (0168, 0171) stated that the EPA has correctly concluded that the technologies being used to control HAP metal emissions from sources regulated under NESHAP subpart MM have not changed and that subpart MM emission limits should not be changed. According to the commenters, nothing fundamental has changed as it relates to the technologies available to control HAP metal emissions at chemical recovery sources or the ability of those technologies to mitigate or eliminate the unavoidable excess emissions during some operational periods. Absent such new or improved technologies, the commenters stated that there is no basis for the EPA to revise the standards to indicate that they apply at all times.

**Response:** As explained in the preamble to the proposed rule (see 81 FR 97071-75), after reviewing the types of control technologies in use and PM emissions data for kraft and soda recovery furnaces, lime kilns, and SDTs and sulfite combustion units, we stated that the current subpart MM emission limits continue to represent the performance of existing and new sources. The technology review did not reveal any developments in practices, processes, and control technologies for reducing the PM emissions from these process units that have occurred since promulgation of subpart MM. Therefore, we are not promulgating any changes to the PM emission limits for purposes of the technology review. As discussed elsewhere in this document, we proposed and are promulgating various changes to monitoring requirements to enable affected sources to show continuous compliance with the HAP metal standards (surrogate PM emission limits) at all times.

**3.2.1-04 Comment:** Regarding gaseous organic HAP, multiple commenters (0166, 0168, 0169, 0171) agreed with the EPA's conclusion that requiring mills to convert or replace DCE furnaces and wet bottom ESPs is not cost-effective, and subpart MM organic HAP emission limits should not be changed. Commenter 0168 noted that the RTI cost/impacts review

memorandum (Docket Item No. EPA-HQ-OAR-2014-0741-0148), Appendix A, indicates that the cost of the conversions would be \$180,544/ton methanol and \$158,713/ton organic HAP, which are both unreasonable to require.

Because of the significant amount of capital involved, commenter 0168 stated that decisions to convert or replace an existing DCE furnace can only be financially justified when the project is part of a major mill expansion that can guarantee a significant return on investment and a timely payback of capital. According to the commenter, a recovery furnace is one of the most expensive assets at a mill, and although it undergoes routine maintenance work to ensure continued proper, safe, and reliable operation, it is not routinely replaced or converted to a non-direct contact evaporator (NDCE) unit, especially as a standalone project.

Commenter 0166 concurred with this conclusion, providing real-world examples of conversions within their company. The commenter noted that their company currently operates four DCE recovery furnaces and has converted or replaced six other DCE recovery furnaces with NDCE units since the originally promulgated subpart MM rule. According to the commenter, these conversions occurred primarily due to the economic benefits of the conversions or the life cycle of the equipment. The commenter noted that each conversion was accompanied with evaporator system upgrades and several included the installation of new electrical turbines to further improve the energy efficiency of the facility. The commenter stated that it is unlikely that replacement or conversion of the remaining four DCE recovery furnaces would be approved absent similar economic drivers, as the HAP or criteria pollutant emissions reductions associated with such conversions could not justify such significant capital investments.

In addition to cost considerations, commenter 0168 indicated that, in some cases, conversion of a DCE furnace to a NDCE furnace is not technologically feasible. For example, the commenter stated that older DCE furnaces that are constrained by size, structural, and surrounding space limitations would not be candidates for a conversion. According to the commenter, DCE replacements with new, larger NDCE furnaces occur as part of extremely large capital projects that can total \$100 million or more, and typically trigger complex regulatory requirements and take years to plan and permit.

Commenter 0168 further argued that the economic effect of the EPA forcing a conversion of the remaining DCE furnaces to NDCE technology would be devastating to the U.S. pulp and paper industry, and would likely force the shutdown of mills that serve markets where excess production capacity already exists and investment cost associated with furnace conversions cannot be recaptured through expanded production. Commenter 0169 concurred, stating that it is not economically feasible and would impact the sustainability of the mills.

**Response:** We acknowledge the concerns expressed by commenters regarding the economic impacts associated with replacing (or converting) the remaining DCE recovery furnaces to NDCE technology as compared to the environmental benefits. As part of our AMOS analysis conducted under section 112(f)(2) (see 81 FR 97069-70) and our technology review conducted under section 112(d)(6) (see 81 FR 97070-71), we analyzed the costs and environmental impacts of replacing or converting DCE recovery furnaces to the NDCE design and converting the NDCE recovery furnace wet-bottom ESPs in the industry to dry-bottom ESPs to reduce emissions of gaseous organic HAP from kraft and soda recovery furnaces.



We estimated high capital costs of \$1.3 to \$3.7 billion and annualized costs of \$120 to \$440 million for DCE recovery furnace installation (or conversion) projects due to the integral nature of the recovery furnace within the pulp mill and the number of upstream and downstream equipment components that must be removed, replaced, or reengineered along with the recovery furnace itself. We estimated these costs would be borne by 21 facilities that continue to operate DCE recovery furnaces and are not already projected to replace these systems in the absence of any regulatory action. The cost effectiveness of recovery furnace conversions or replacements is also high, at an estimated \$44,000 to \$159,000 per ton of gaseous organic HAP reduced. We estimated a range of costs based on multiple information sources. We estimated capital costs of \$56.1 million for wet- to dry-bottom ESP conversions at 11 mills with NDCE recovery furnaces, with cost effectiveness of \$54,000 per ton of gaseous organic HAP removed.

The total costs of the gaseous organic HAP options we considered are an estimated \$1.4 to \$3.7 billion in capital cost borne by 32 facilities, to achieve an estimated emission reduction of 2,920 tpy of gaseous organic HAP at a cost effectiveness of \$45,000 to \$153,000 per ton of gaseous organic HAP removed. (See 81 FR 97071, December 30, 2016.) Given the high capital costs and high cost per ton of emissions reduced, we are not finalizing additional regulation of recovery furnace gaseous organic HAP emissions as a result of the AMOS analysis and technology review.

## **3.2.2 Monitoring Requirements**

### ***3.2.2.1 Continuous Opacity Monitoring***

**3.2.2.1-01 Comment:** Multiple commenters (0164, 0166, 0168, 0169, 0171) objected to the proposed changes to the opacity requirements for recovery furnaces and lime kilns, questioning its cost effectiveness and stating that the technology review should not result in changing the opacity requirements. According to the commenters, the technology review memorandum states, “No new technologies or regulatory options for incremental improvements to the subpart MM PM emission limits for recovery furnaces were identified.” The commenters noted that, under subpart MM, recovery furnaces that use a dry ESP to comply with the PM limit are required to continuously monitor opacity; corrective action is currently required when 10 consecutive 6-minute average opacities exceed 20 percent; and a violation occurs if opacity is greater than 35 percent for more than 6 percent of the operating time in any quarter. The commenters stated that the 35 percent opacity level is an “operating limit,” not a standard, and is used as an indicator of compliance with the recovery furnace PM limit. If the EPA has determined as a result of both the risk and technology review that the PM limit should not be revised, the commenters argued that the opacity operating limit and monitoring provisions should not then be revised. Commenter 0165 asked how opacity monitoring will be conducted under the new rules, and what the allowable limits would be.

Some commenters (0164, 0168, 0171) also objected to the EPA revising the opacity monitoring provisions for existing recovery furnaces and lime kilns based on an evaluation it conducted during the review of the Kraft Pulp Mill New Source Performance Standards (NSPS). Although the EPA made changes to the opacity provisions for new and modified units as part of finalizing NSPS subpart BBa, the commenters argued that those changes are not appropriate for existing units subject to subpart MM.

Commenter 0168 stated that, although opacity is a good relative indicator of ESP performance, opacity measurements are impacted by particle characteristics, which can cause inter-unit variability in correlations between opacity and actual mass-based particulate emissions (in other words, two units with the same PM emission rate could experience significantly different opacity levels). The commenter noted that variations in particle characteristics such as density, color, luster, size, and shape impact the level to which the optical beam is diffracted or absorbed by entrained particles as it travels back and forth across the flue gas path. The commenter further noted that particle characteristics can be influenced by a variety of operating parameters including unit design, fuel source, operating load, and operating practices that are specific to a given unit. According to the commenter, an exceedance of the proposed 6-minute average 20 percent opacity operating parameter limit should not be deemed indicative of an exceedance of the 3-hour average PM limit for recovery furnaces. The commenter noted that the EPA originally developed the 35 percent opacity operating limit and 20 percent corrective action level as indicators of ongoing compliance with the PM emission limit, based on a review of the data available at the time subpart MM was developed, and argued that the current analysis has not presented any information that supports that reductions in the opacity operating parameter limit or monitoring exceedance thresholds are warranted. In fact, the commenter noted that half of the units the EPA states will be affected by this proposed change have PM test data below the new source limit, so they are among the top performing units, and the remaining units have test data that demonstrate emissions are at least 43 percent less than the existing source limit, so they are operating with a large margin of compliance.

Commenters 0164 and 0168 pointed out that the statute directs the EPA to revise MACT standards only where “necessary...taking into account developments” in process and control technology. The commenters contended that the EPA must identify specific changes in the applicable technology that necessitate a change in the standard and stated that it has not done so here. The commenters argued that the EPA has instead concluded that it can set a more-stringent standard than can be met by some mills using the same technology that formed the basis of the existing subpart MM MACT standards. According to the commenters, Congress clearly did not intend for section 112(d)(6) to authorize the EPA to tighten emissions standards that companies have already taken the steps to meet, absent a specific change in available technology or significant residual human health or environmental risk. Moreover, even if new, more-effective control technology were available, the commenters argued that the EPA would still need to consider the cost effectiveness of that technology and other factors (as the EPA has acknowledged, see *NRDC v. EPA*, 529 F.3d 1077, 1084 (D.C. Cir. 2008)). The commenters noted that the EPA has analyzed the cost of its proposed changes to the subpart MM opacity monitoring provisions, and Table 5 in the preamble indicates the cost effectiveness is “>\$5.5 million per ton HAP metals,” which the commenters stated is clearly not cost-effective. The commenters stated that even the estimated cost of \$36,800/ton PM is several times higher than the level that would be considered cost-effective in a best available control technology (BACT) analysis.

Commenters 0164 and 0168 also stated that the only information that the EPA relies on to propose these revisions to the opacity monitoring provisions, purportedly under authority of CAA section 112(d)(6), is that some mills are achieving opacities lower than the levels assumed for the current MACT standards and experiencing deviations much less frequently than allowed by the current standards. The commenter argued that this is entirely to be expected; in fact, it

would be surprising if mills were meeting the opacity operating parameter limits at all times and yet on average had emissions no lower than the existing MACT standards. As an example, the commenter pointed out that sound engineering and environmental control practices would require a control device to be designed and operated with a removal efficiency greater than that required to meet the PM limit to assure compliance at all times. According to the commenter, nothing in the language of section 112(d)(6), the legislative history of section 112, or common sense suggests that Congress wanted the EPA to constantly “ratchet-down” the MACT standards, thereby removing the margin of compliance that facilities have built into their control systems. The commenter stated that adjustments are appropriate only when there are advances in “practices, processes, or control technologies.” Although the EPA states in the preamble that the fact that some units are regularly operating with opacities below 20 percent (or well below the exceedance threshold) is evidence of an improvement in operating practices,<sup>83</sup> the commenter argued it provides no support for this conclusion and does not provide a comparison of current operating practices to the operating practices that were in place with the original standard was promulgated.

Commenters 0164 and 0168 further noted that the EPA proposed to lower the opacity monitoring allowance (currently 6 percent) to 2 percent for recovery furnaces and to 1 percent for lime kilns. The commenters pointed out that these monitoring allowances also include startup and shutdown periods when lime mud or liquor is being fired. Although these changes align with the changes the EPA recently made in NSPS subpart BBa for new, reconstructed, and modified recovery furnaces and lime kilns, the commenters contended they are not justified or necessary as part of the RTR of the MACT standards for existing units. The commenters argued that the EPA should not force NSPS compliance on existing units as part of the RTR process.

Commenter 0168 noted that commenter 0167 identified that the continuous opacity monitoring system (COMS) data analyzed by the EPA during development of NSPS subpart BBa excluded data during startup and shutdown periods, in several instances (see the following comment for more information). According to the commenter, bringing in additional data corresponding to startup and shutdown periods when lime mud or black liquor solids (BLS) is being fired could dramatically change the conclusions regarding achievability and subsequently the costs and impacts outlined in Table 5 of the proposal preamble. The commenter concluded that the EPA’s justification and proposal to lower the opacity limit and the associated monitoring allowance, while stipulating that said allowance should provide flexibility during startup/shutdown periods, while the monitoring allowance previously excluded those periods, is therefore unsupported.

Commenter 0168 also noted that their member companies have indicated that there are additional units that would be adversely affected by this proposed change, based on the member companies’ review of more recent and more extensive data. The commenter noted that one member company (commenter 0164) indicated that their mill not included in the EPA’s cost analysis will require \$30 million in capital to comply with the proposed requirements (see the comments in section 8.2 of this document for more information).

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<sup>83</sup> 81 FR 97072

Commenter 0169 argued that costly ESP equipment upgrades are not economically feasible and would impact the sustainability of their mills. The commenter stated that additional operational controls, which include costly curtailment of BLS firing during maintenance, would be required to meet the proposed opacity operating limit. The commenter also stated that a lower opacity operating limit for existing recovery furnaces will constrain routine operation and maintenance practices, during periods of time that their mills have previously demonstrated being in compliance with the PM standards. Routine operating practices include shutting down fields and sides of ESPs for maintenance while continuing to operate recovery furnaces.

Commenter 0168 noted that the EPA's conclusions on the ability of recovery furnaces and lime kilns to comply with a lower excess emissions threshold is based on their review of only 1 year of COMS data for 2009 submitted as part of the 2011 Pulp and Paper ICR. According to the commenter, examination of only 1 year of data is not adequate to fully determine the impacts of the proposed change or to demonstrate that there has been a change in operating practice. The commenter contended that the EPA provides no analysis or insight into what factors result in facilities having opacity exceedances over a particular semiannual or quarterly period. According to the commenter, the EPA merely assumes that the 1-year data set is representative of the performance of each unit and makes an unsupported assumption about the actions needed by certain mills to improve performance. The commenter argued that the EPA's assumption--that mills with ESPs that have historically performed at a level below the new source emission limit can simply increase the frequency of maintenance to lower the number of periods where opacity is above the current corrective action level of 20 percent--is not supported. The commenter stated that some facilities may have to perform capital work on components such as the ESP ash removal system or upgrade/replace their ESP to improve performance to the levels the EPA proposed. For the one mill for which the EPA estimated only an increase in annual maintenance, the commenter believes that it would actually require at least \$10 million in capital work to perform ESP upgrades in order to maintain opacity below 20 percent overall operating conditions.

Commenter 0168 noted that HAP metals are less than 0.5 percent of PM emissions, and the entire inventory of recovery furnaces covered by subpart MM emits only 6.4 tpy HAP metal. Therefore, the commenter concluded, the proposed change will not provide significant HAP emissions reduction (in fact, the mills for which the EPA predicts only an increase in the frequency and cost of maintenance are not predicted to experience any HAP emissions reduction), does not represent any change in technology or reduction in risk, and should not be finalized.

Commenter 0167 stated that the COMS data for recovery furnaces do not include periods of startup and shutdown in all instances, and that the EPA's analysis of existing recovery furnace performance relative to the 20 percent opacity limit and 2 percent semiannual monitoring allowance is therefore incomplete. The commenter noted that the EPA reviewed the COMS performance data that were submitted as part of the 2011 Pulp and Paper ICR and summarized

the results in a June 14, 2016 memorandum.<sup>84</sup> The commenter noted that, in the proposed rule, the EPA stated the following:

The COMS data for 135 recovery furnaces show that the majority of existing recovery furnaces, regardless of design (DCE or NDCE), and with most controls, are meeting a 20-percent opacity limit based on a 6-minute average, with fewer than 2 percent of averaging periods exceeding 20-percent opacity, including periods of startup and shutdown.

Commenter 0167 noted that, in the 2011 ICR, facilities were encouraged to include information for startup and shutdown periods in their COMS data submittals. However, the commenter indicated that their targeted review of recovery furnace COMS data in the ICR<sup>85</sup> has identified approximately 20 instances where startup and shutdown data were excluded from data submittals.

In their comments, commenter 0167 presented the following examples of select COMS data for recovery furnaces for periods around a shutdown and startup:

- In example 1, opacities are not reported for periods labeled “Shutdown” and again for periods labeled “Startup.” Note that the hourly production (BLS firing) rates for the first reporting period after Startup appear to correspond to normal operation and not to a “ramp-up” period.
- In example 2, transition periods (shutdown or startup) are not identified as such and all time periods without opacity data are labeled “process down.” The hour(s) immediately preceding commencement of normal operation (0.05, 03/02/2009, with normal BLS firing) are also labeled “process down” even though the unit would have presumably been ramping up after the shutdown.

Commenter 0167 also noted that several sets of recovery boiler COMS data did not include production rate information or the production rate was labeled as confidential business information (CBI), thereby making it difficult to assess whether datasets were appropriately included.

Commenter 0167 stated that the achievability analysis of the proposed 20 percent opacity limit and 2 percent semiannual monitoring allowance for existing recovery furnaces is incomplete in the absence of the startup and shutdown data. The commenter indicated that this could also impact the options analysis carried out by the EPA and the costs/impacts identified in Table 5 in the preamble.

Commenter 0167 concluded that their review of recovery furnace COMS data identified multiple instances where startup and shutdown data were excluded from the datasets. The commenter indicated this has the potential to impact the EPA conclusions on the achievability of the proposed opacity limits and monitoring allowances for recovery furnaces. The commenter

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<sup>84</sup> U.S. EPA. *Review of the Continuous Emission Monitoring and Continuous Opacity Monitoring Data from the Pulp and Paper Information Collection Request Responses for Subpart MM Sources*. June 14, 2016. (Docket Item No. EPA-HQ-OAR-2014-0741-0158).

<sup>85</sup> U.S. EPA. *Kraft Recovery Furnace COMS Data*. December 30, 2016. (Docket Item No. EPA-HQ-OAR-2014-0741-0159).

indicated it was unclear whether the same phenomenon extends to COMS data for lime kilns. The commenter requested the EPA take these factors into consideration before finalizing the proposed monitoring allowances that also include periods of startup and shutdown.

**Response:** We reviewed the opacity data and revised our cost analysis in light of these comments on the proposed changes to the opacity operating limits. As a result of our reanalysis, we are not finalizing the proposed changes to the opacity limits, but we are adjusting the monitoring allowances. The final rule retains the originally-promulgated 35 percent opacity limit (with the associated 20 percent opacity corrective action level) for existing recovery furnaces, but reduces the 6 percent monitoring allowance for recovery furnaces to 2 percent. For lime kilns, the final rule retains the originally-promulgated 20 percent opacity limit (as proposed) and reduces the monitoring allowance from 6 percent to 3 percent. Rationale for our decisions is provided below.

As a preliminary matter, we disagree with the commenter that the opacity limit should not be revised because the PM limit was not revised. The opacity limit under subpart MM is part of the monitoring requirements in §63.864, and serves as a separate indicator of ESP performance, but is not the HAP metal standards (surrogate PM emission limits) in §63.862; therefore, the opacity limit was reviewed independently from the PM limit. We interpret section 112(d)(6) as requiring us to consider all developments in practices, processes, and control technologies in the industry. When we take into account the “development in practices, processes, and control technologies,” we interpret that language as providing for the EPA to not only evaluate new control technologies and process improvements, but to also evaluate the application of the control technologies that were the basis for the current standards. In that evaluation, we examine whether, in the “practice” of applying the MACT standard technology, there have been technological advances. Generally, we consider whether the MACT floor technology, in practice, is performing better than anticipated in the original analysis.

We agree with the commenter’s assertion that the opacity limit is an “operating limit” that is used as an indicator of compliance with the PM limit. Opacity is used as an indicator of ESP performance and the data used in our COMS analysis show that ESPs are performing better than the operational limit. We disagree with the commenter’s statement that the EPA must identify specific changes in the applicable technology that necessitate a change in the standard. The MACT technology, as applied, performs better on opacity than was expected when the original rule was promulgated which supports our consideration of revisions to the opacity limits and monitoring allowances.

*Recovery furnaces.* The commenters were against the 20 percent opacity limit and 2 percent monitoring allowance on a semiannual reporting basis proposed for existing recovery furnaces. As proposed, this limit impacted 15 recovery furnaces at 11 facilities, with an estimated capital cost of \$42 million and an annualized cost of \$8.7 million/year, based on the assumption that most units could meet the proposed limit with improved ESP maintenance. The commenters stated that the EPA’s assumption for “improving maintenance” to reduce the number of exceedances of a 20 percent opacity limit is incorrect, and facilities would incur emission unit shutdown (and resulting lost production) and potential capital costs to meet the reduced opacity limit and monitoring allowance. Reanalysis of the costs for impacted units, considering commenter’s assertions that they would need an ESP upgrade to meet the proposed

standard, resulted in estimated capital costs of \$124 million and annualized costs of \$21 million/year (based on a 7 percent interest rate).<sup>86</sup> The revised costs were determined not to be cost-effective, considering the low level of associated HAP metal reduction (0.07 tpy) estimated to be achieved.

Commenter 0167 and 0168 noted that including startup and shutdown data in the COMS analysis could change the outcome. Further analysis of the recovery furnace COMS data sets show that 109 of the 158 data sets analyzed contained startup and shutdown data, not associated with periods of “0” production rates. Approximately 62,200 6-minute averages for periods of startup and shutdown were used in the COMS analysis for the proposed rulemaking. Of these 6-minute averages, 2,485 exceeded 20 percent opacity. The average opacity for the startup and shutdown data set was 44 percent, and the median was 40 percent, supporting our decision to retain the opacity monitoring allowance to ensure there is adequate flexibility in the rule to address startup and shutdown. While not all of the sets contained data that were labeled as startup and shutdown, recovery furnace startup and shutdown are adequately demonstrated in the utilized 109 data sets. It is unclear if the remaining 49 data sets contained startup and shutdown data because they contained no data labeling.<sup>87</sup> The EPA acknowledges that 2009 data may not be perfectly representative of current operation for all recovery furnaces, as suggested by the commenters, and that the number of startup and shutdown events likely vary from year to year. However, given that there have been no fundamental changes in the types of control technologies used, and that the data analyzed contained a full year of COMS data for nearly every recovery furnace in the U.S., we maintain that the data were amply complete and sufficiently representative to form the basis for our conclusions. Furthermore, the EPA explained in the preamble to the proposed rule that the monitoring allowances were maintained to provide flexibility for periods of startup and shutdown because of the removal of the SSM exemption. Considering the results of our reanalysis of the opacity data and costs, we are not finalizing the existing recovery furnace opacity standard as proposed. The EPA is finalizing a 35 percent opacity limit for existing recovery furnaces, with a 20 percent corrective action level (same as the originally promulgated rule), and a 2 percent monitoring allowance with a semiannual reporting period. All COMS data sets analyzed for the proposed rule would meet this limit; therefore, no equipment costs are estimated to be associated with this change. A 2 percent monitoring allowance reflects improvements in operating practices from the previous 6 percent allowance, but allows sufficient flexibility for periods of startup and shutdown. The EPA is finalizing as proposed the 20 percent opacity limit and 2 percent monitoring allowance for new recovery furnaces.

*Lime kilns.* While commenters 0164, 0166, 0167, and 0168 focused on recovery furnace opacity, they were also opposed to the proposed reduction in the opacity monitoring allowance from 6 percent to 1 percent for lime kilns. As proposed, a 20 percent opacity limit with a 1 percent monitoring allowance based on a semiannual reporting period resulted in two lime kilns at two facilities that would need to either upgrade their ESPs or improve ESP maintenance to meet the standard. The annualized cost for these two facilities was estimated at \$68,000 at

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<sup>86</sup> Holloway, T., RTI. *Revised Costs/Impacts of the Subpart MM Residual Risk and Technology Review for Promulgation*. Memorandum to K. Spence, U.S. EPA.

<sup>87</sup> Spence, K. U.S. EPA. *Addendum to the Review of the Continuous Opacity Monitoring System Data from the Pulp and Paper ICR Responses for Subpart MM Sources*. Memorandum to EPA-HQ-OAR-2014-0741.

proposal, based on the assumption that they would meet the new standard by improving maintenance of their ESP. The EPA did not estimate any PM or HAP metal reductions with the reduction in the opacity monitoring allowance, because the ESPs were already reducing PM to low levels. Further analysis of these two units, assuming that ESP upgrades would be required to meet the proposed standard, resulted in an estimated capital cost of \$4.8 million and an estimated annualized cost of \$0.9 million/year (based on a 7 percent interest rate).<sup>88</sup> The revised costs were determined not to be cost-effective, considering no associated HAP metal reductions were estimated to be achieved.

Further analysis of the lime kiln COMS data provided in the 2011 ICR responses shows that 16 units (17 data sets) contained startup and shutdown data, not associated with periods of “0” production rates. Approximately 16,700 6-minute averages for periods of startup and shutdown were used in the COMS analysis for the proposed rulemaking. Of these 6-minute averages, 435 exceeded 20 percent opacity, and the average and the median for these 6-minute averages were each 42 percent, suggesting that retention of a monitoring allowance is appropriate.<sup>89</sup> As noted for recovery furnaces above, the 2009-2010 ESP-controlled lime kiln COMS data sets were judged to be sufficiently complete and representative to form the basis for our decision-making.

Considering this information and the analyses performed for the final action, the EPA is not finalizing the proposed monitoring allowance of 1 percent, but is finalizing a monitoring allowance of 3 percent for lime kilns. All lime kilns that commence construction, reconstruction, or modification after May 23, 2013 will be subject to 40 CFR part 60, subpart BBa and would still be required to meet a monitoring allowance of 1 percent under subpart BBa . All COMS data sets analyzed for the proposed rule would meet a 20 percent opacity limit with a 3 percent monitoring allowance based on a semiannual reporting period. Therefore, no costs are estimated to be associated with this change. A 3 percent monitoring allowance reflects improvements in operating practices from the previous 6 percent allowance, but allows sufficient flexibility for periods of startup and shutdown as compared to the proposed 1 percent allowance.

**3.2.2.1-03 Comment:** Commenter 0169 reviewed the mill-specific data included in the EPA’s docket for this rulemaking (Docket ID No. EPA-HQ-OAR-2014-0741) and suggested a correction to the docket. In its review of opacity monitoring data (Docket Item No. EPA-HQ-OAR-2014-0741-0158), the EPA included an analysis of compliance with the opacity standard under the EPA’s proposed opacity options. Commenter 0169 provided the following clarification for Unit ID 145.55 (see tab 145.54, .55(A) in Docket Item No. EPA-HQ-OAR-2014-0741-0159):

This unit’s data included opacity values when the precipitator was off-line and not operating. All opacity data associated with any “F” code next to it is offline, non-operating data. Inclusion of this data resulted in Unit ID 145.55 being incorrectly identified as not meeting the various opacity compliance options.

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<sup>88</sup> Holloway, T., RTI. *Revised Costs/Impacts of the Subpart MM Residual Risk and Technology Review for Promulgation*. Memorandum to K. Spence, U.S. EPA.

<sup>89</sup> Spence, K. U.S. EPA. *Addendum to the Review of the Continuous Opacity Monitoring System Data from the Pulp and Paper ICR Responses for Subpart MM Sources*. Memorandum to EPA-HQ-OAR-2014-0741.



**Response:** The EPA appreciates the clarification of the associated opacity reading codes for unit 145.55. We updated the analysis for this unit and agree with the commenter that the unit would meet all of the proposed options. Our cost analyses and options have been updated accordingly.

**3.2.2.1-04 Comment:** Commenter 0168 argued that mills should not be required to round opacity to the nearest 1 percent, as the EPA proposed by adding §63.864(d)(5), which states, “As specified in §63.8(g)(4), each 6-minute COMS data average **should** be rounded to the nearest one percent opacity.” The commenter stated that this proposed change does not reflect what is actually stated by §63.8(g)(4), which states that the data **may** be rounded to the nearest 1 percent opacity. (emphasis added.)

**Response:** The COMS data we reviewed for this rulemaking contained a mixture of data sets using decimals and whole numbers. Given that facilities are not already rounding to whole numbers, we are not finalizing the proposed §63.864(d)(5) requiring rounding to nearest one percent opacity from the final rule. Section 63.8(g) of the General Provisions continues to apply, including 40 CFR 63.8(g)(4) which states that “the data **may** be rounded to the same number of significant digits as used in that standard to specify the emission limit (*e.g.*, rounded to the nearest 1 percent opacity).” (emphasis added)

### **3.2.2.2 ESP Parameter Monitoring**

**3.2.2.2-01 Comment:** Multiple commenters (0164, 0166, 0168, 0169, 0171) stated that the ESP total power monitoring provisions should be removed or revised. The commenters noted that the proposed revisions to subpart MM include a requirement to continuously monitor ESP secondary voltage and current, and calculate total secondary power to indicate ongoing compliance at all times, including times when the opacity monitoring allowance is used.

Instead of adding a burdensome additional monitoring requirement that is duplicative of the opacity monitoring already being conducted, some commenters (0164, 0168, 0169, 0171) suggested that the EPA should instead require proper operation of the ESP’s automatic voltage control (AVC) or power management system as a work practice. Commenters noted that the EPA set a precedent of giving favorable treatment for automatic control systems like this when it allowed a 5-year tune up frequency in Boiler MACT for units with automatic oxygen trim systems. Commenters noted that the automatic trim system ensures that boiler combustion is optimized, rather than allowing manual control by an operator, in much the same way as the AVC or power management system results in the most efficient operation of an ESP. Instead of finalizing a requirement that will force operators to artificially lower ESP power during a performance test to attempt to set an operating limit that can be met under all operating conditions, the commenters suggested that the EPA should extend operators the flexibility to use the appropriate technology to optimize the performance of their ESP and manage energy use.

Some commenters (0164, 0166, 0168) stated that, if facilities are required to set an operating limit based on a performance test run under worst-case/high-load conditions, then particulate loading to the ESP is maximized, resulting in high current and high calculated power. After the test, however, the commenters stated that lower operating loads will result in lower

power values, which under the EPA's proposal will result in operating limit deviations completely unrelated to any increase in emission rate.

Commenters 0166 and 0168 noted that secondary voltage is the electrical potential applied to the discharge electrodes inside the ESP. According to the commenters, a typical rule of thumb is that you can apply about 10,000 kilovolts (kV) to the electrodes per inch of clearance between the electrodes and the collection plates before there is an arc across the gap between the electrodes and the plates. The commenters noted that the exact amount of potential you can apply prior to an arc occurring is impacted by factors like temperature, moisture content of the gas stream, and the concentration of particles in the gas stream. According to the commenters, most ESPs are equipped with an AVC, which detects arcs and controls voltage to just below the point that arcs occur, with the goal of maximizing voltage based on operating conditions within the ESP. The commenters noted that secondary current is the electrical current applied to the system and is proportional to the electrical charge being applied to the particles passing through the system. Accordingly, the commenters indicated that current is highly dependent on the particulate loading to the ESP and the voltage level that the AVC can maintain without excessive arcing. According to the commenters, power, calculated as the product of voltage and current, is a good measure of how much "work" an ESP is doing but not necessarily indicative of compliance with an emission rate if ESP inlet loading is variable.

Commenters 0166 and 0168 indicated that secondary voltage is a better parameter than secondary power because high operating rates and high PM loading rates during performance tests are expected to decrease secondary voltage values and thereby ensure that minimum values are used to set operating limits. The commenters also noted that most ESP operational problems, such as plate/electrode misalignment and rapper system failure, will generally result in reduced ESP secondary voltage, alerting the operator to the problem, whereas some operational problems are likely to increase current, even though PM collection efficiency is reduced. If the EPA does not accept the work practice approach mentioned above, commenters suggested total secondary voltage should be allowed instead of total secondary power to avoid excessive apparent operating limit deviations based on routine operating load variability. The commenters noted that the EPA has already acknowledged that secondary voltage is the proper parameter to monitor during periods of low-load operation because it has proposed to exclude monitoring of secondary current and total secondary power during periods of startup and shutdown. The commenters suggested that the EPA should also edit the language at §63.864(e) to make it clear that, although the parameters are measured for each field, the operating parameter limit is not on a field-by-field basis, but ESP total. The commenters noted that some facilities with oversized ESPs conduct performance testing with one field out of service to avoid deviations when operation of one field is lost during normal operation of the furnace or kiln, or when a field must be taken out of service for maintenance.

If the ESP power monitoring requirement is retained in the final rule, commenters 0168 and 0169 recommended that the EPA allow monitoring of power per load. According to the commenters, using power per load instead of total power would account for operating conditions that vary from those during the performance test. The commenters indicated it would also allow operators to reduce throughput, isolate part of the ESP, and fix malfunctions on the fly while maintaining opacity below the operating parameter limit, instead of forcing a complete shutdown to avoid an ESP total power excursion. Commenter 0168 pointed out that the EPA has allowed

operating parameters to be adjusted based on load in other MACT rules, such as sorbent injection rates in Boiler MACT.

**Response:** The EPA proposed the ESP parameter monitoring requirements for recovery furnaces and lime kilns with ESPs in addition to the currently-required continuous opacity monitoring requirements to provide an additional indicator of ESP performance and enable affected sources to show continuous compliance with the HAP metal standards (surrogate PM emission limits) at all times, including periods when the opacity monitoring allowance is used, (81 FR 97073). For example, these requirements were proposed to provide an indicator that the ESP was efficiently operated and properly maintained for the duration of the semiannual reporting period, including during periods of startup and shutdown. The proposed ESP parameter monitoring requirements were consistent with ESP parameter monitoring requirements included in the kraft pulp mill NSPS review finalized in 2014. The revised NSPS (40 CFR 60, subpart BBa) applies to new and reconstructed recovery furnaces and lime kilns, but do not apply to existing sources. The ESP parameter monitoring requirements proposed for subpart MM would apply to existing and new sources, effectively requiring existing sources to adjust existing data acquisition systems (DAS) to record and report the ESP parameter monitoring data.

At the time of the proposed rule, we estimated that the proposed ESP parameter monitoring requirements would have a capital cost of \$5.7 million and annualized cost of \$1.4 million per year for 96 pulp mills with impacted ESP-controlled recovery furnaces and lime kilns (81 FR 97073). Commenters have provided information suggesting that we underestimated the ESP parameter monitoring costs, specifically that EPA incorrectly assumed that all ESPs were equipped with the ability to record the parameters (see comment 8-02). Based on our review of this cost information, we conducted a reanalysis and estimated revised costs of \$16 million in capital costs and \$4 million in annualized costs associated with adding ESP parameter monitoring for existing sources.

Given that the intent of the proposed additional ESP monitoring was to ensure efficient operation and proper maintenance of the ESP and that commenters suggested that the use of the AVC ensures efficient operation and notifies operators of issues requiring maintenance, and that the costs were significantly higher than EPA estimated at proposal, we are not finalizing the proposed ESP parameter monitoring requirements. The EPA is instead finalizing a requirement for recovery furnaces and lime kilns equipped with ESPs to maintain proper operation of the ESP AVC. This requirement applies at all times, including times when the opacity monitoring allowance is used. Because existing ESPs already have AVCs, we have associated no cost with this requirement beyond recordkeeping costs. The final rule also clarifies that the requirement to maintain proper operation of the ESP AVC does not apply to recovery furnaces and lime kilns subject to NSPS subpart BBa because ESP parameter monitoring is required for these units in subpart BBa.

### ***3.2.2.3 ESP/Scrubber Parameter Monitoring***

**3.2.2.3-01 Comment:** Commenter 0166 noted that the EPA has proposed that facilities with a recovery furnace or lime kiln controlled by a dry ESP followed by a wet scrubber must maintain ESP secondary current and secondary voltage (or secondary power) levels demonstrated during the compliance test, and if there are 6 or more 3-hour averages on a

semiannual basis below this level, it will be considered a violation as outlined in §63.864(k)(v)(B). The commenter was concerned that this ESP continuous monitoring system (CMS) is being held to such a stringent standard of a 3-hour average, while at the same time the combined wet scrubber is also required to maintain established minimum operating parameters. The commenter noted that these combined control systems are required to maintain all the parameters, while a stand-alone ESP is required to maintain the secondary power on a semiannual average.

Commenter 0166 was concerned that under low particulate loading to an ESP, the power level will drop and that maintaining the power level over a short average period of 3-hrs will be a significant challenge for continuous compliance. The commenter 0166 requested that the EPA modify the averaging period for the ESP parameters for the combined ESP and wet scrubber control systems to a longer averaging period and establish secondary voltage as the ESP CMS.

**Response:** Given the technical issues and costs associated with ESP parameter monitoring identified by commenters in this comment and in comments 3.2.2.2-01 and 8-02, we have replaced the ESP parameter monitoring requirements with a requirement to ensure proper ESP operation. The final rule requires facilities operating combined ESP-scrubber systems on existing recovery furnaces and lime kilns to: (a) maintain proper operation of the ESP AVC, and (b) continue to monitor wet scrubber operating parameters using a 3-hour averaging period.

The ESP parameters proposed to be monitored for combined ESP and wet scrubber systems were the same as those adopted in the 2014 NSPS review (*i.e.*, secondary voltage and current, or secondary power) for new and reconstructed recovery furnaces and lime kilns. The key difference is that subpart MM would have required a more stringent 3-hour averaging time for the ESP parameters. A 12-hour block averaging time is required for both ESP and wet scrubber monitoring parameters under 40 CFR part 60, subpart BBa. The 3-hour averaging time for wet scrubber parameters is currently required under subpart MM, and was not proposed to be revised. As noted in the response-to-comments document for the NSPS review, the 3-hour averaging time under subpart MM satisfies the 12-hour block averaging time under subpart BBa for wet scrubber parameters.<sup>90</sup> We have clarified in the final subpart MM rule that the requirement to maintain proper operation of the ESP AVC does not apply to recovery furnaces and lime kilns subject to NSPS subpart BBa because ESP parameter monitoring is required for these units under subpart BBa.

**3.2.2.3-02 Comment:** Commenter 0166 agreed with the EPA's proposal to clarify the requirement to monitor opacity on the emissions from all dry ESPs. The commenter noted that, in the original writing of subpart MM, the EPA did not appear to consider the applicability of this opacity monitoring requirement if the dry ESP was followed by a wet scrubber system. The commenter noted that their company has several lime kilns and one recovery furnace with this configuration. According to the commenter, applying an opacity limit and the requirement for a COMS prior to the second emissions control device does not make sense given that the emission limits apply to the final exhaust to atmosphere and that a facility achieves further emissions

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<sup>90</sup> U.S. EPA. *Kraft Pulp Mills New Source Performance Review (40 CFR Part 60, Subpart BBa) Final Amendments: Response to Public Comments on May 23, 2013 Proposal*. March 13, 2014. p. 111.

reductions via the wet scrubber, and the commenter believed that this was not the intent of the original rule.

**Response:** We acknowledge the commenter’s support for use of continuous parameter monitoring instead of continuous opacity monitoring for combined ESP and wet scrubber control systems. As noted above, the final rule includes a requirement to maintain proper operation of the ESP AVC and continuous wet scrubber parameter monitoring for these systems.

#### **3.2.2.4 Other Comments**

**3.2.2.4-01 Comment:** Commenter 0173 supported the EPA’s proposed updates to the monitoring requirements in the standards. The commenter stated that the updates are well-supported and legally required as part of meeting the EPA’s statutory obligations, and the EPA must finalize the updates it has proposed.

**Response:** As explained elsewhere in this document, we are promulgating changes to the monitoring requirements with some adjustments to the proposed monitoring requirements as a result of public comments. The following updates to the subpart MM monitoring requirements are included in the final rule:

- Reductions in the opacity monitoring allowances for recovery furnaces and lime kilns;
- Addition of a requirement to maintain proper operation of ESP AVC;
- Inclusion of an alternative monitoring parameter for SDT wet scrubbers; and
- Revisions to address removal of the SSM exemption.

**3.2.2.4-02 Comment:** Commenter 0173 argued that the EPA must account for and require stronger emission and fence-line monitoring. The commenter noted that section 112(d)(6) requires the EPA to review section 112 standards in full and determine whether it is “necessary” to change those standards. The commenter further noted that the section 112(d)(6) review process requires the EPA to review all of the control technology available to ensure the Agency continually revisits the requirements applicable to a source category, and determine if further regulation is needed. In addition, the commenter noted that the CAA requires the EPA to set monitoring provisions to assure continuous compliance with emissions standards.<sup>91</sup> As the EPA prepares to finalize action in this rulemaking, the commenter argued that the EPA must consider implementing the following technologies:

- *The use of PM CEMS.* PM CEMS require site-specific correlation of the continuous emission control technology against manual gravimetric EPA methods. PM CEMS have been in use in Europe for several decades. While the EPA has recognized that sources should use this technology at their discretion, the Agency has failed to create performance specifications for these monitors. The EPA has published installation procedures and ongoing calibrations of the continuous emission monitors.<sup>92</sup>

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<sup>91</sup> For example, 42 U.S.C. 7414(a)(3) mandates that the EPA “shall in the case of ... a major stationary source ... require enhanced monitoring and submission of compliance certifications.”

<sup>92</sup> U.S. EPA, Office of Air Quality Planning and Standards, *Current Knowledge of Particulate Matter (PM) Continuous Emission Monitoring*. Sept. 8, 2000.

- *The use of fence-line monitoring.* The EPA has recently required very inexpensive fence-line monitoring at other facilities (refineries). As it recognized in finalizing those standards, the existence of the passive sampling technology was a “development,” and the same is true here.<sup>93</sup> The EPA should require use of this development for pulp mills in view of the significant community complaints about the emissions from these facilities, and the need to detect and prevent significant leaks.
- *The use of an application for iOS and Android phones that combines mapped crowd-sourced reports of “unsafe smells” with air quality data from nearby air pollution sources.*<sup>94</sup> The app would allow residents to track where odors are frequently concentrated, and receive air pollution warnings from the local health department(s). The app contains data collected from government-owned sensors that report particulate levels for air pollutants.<sup>95</sup> The EPA should consider the cost and feasibility of creating a similar app to address significant community complaints of harmful noxious smells.

Noting the long history of violations, malfunctions, and other exceedances of the pulp mill standards, commenter 0173 argued that effective monitoring is required to assure compliance with the standards at all times, as discussed above. The commenter stated that the EPA must follow the CAA’s plain direction to require “enhanced monitoring” in this rulemaking that will assure compliance with the standards.

Commenter 0173 noted that the EPA has recognized the need to implement the CAA’s enhanced monitoring requirements by setting such requirements in other air toxics standards. The commenter also noted that the EPA’s own enforcement division is implementing enhanced monitoring requirements to assure compliance with air toxics standards and other stationary source requirements, and the EPA must require, at least, what its division is requiring as part of its “next generation compliance” policy. Therefore, the commenter stated that the EPA must follow this policy and implement the CAA’s enhanced monitoring requirements in this rulemaking.

**Response:** We have conducted a review of the monitoring requirements for the subpart MM source category. Continuous compliance is ensured through initial and repeat performance tests as well as through continuous opacity or continuous parameter monitoring. While we acknowledge that PM CEMS are available, we did not propose the replacement of the COMS or continuous parameter monitoring system (CPMS) with PM CEMS because our review of the monitoring practices in use for subpart MM pulp and paper combustion sources did not reveal adoption of PM CEMS as an alternative to COMS for ESPs or continuous parameter monitoring for wet scrubber control systems. Based on data available to the Agency collected through the 2011 ICR, only one facility in the subpart MM source category has used a PM CEMS on a sulfite chemical recovery combustion unit. The subpart MM PM emission limits were originally established based on review of stack test data, and little or no relevant data from PM CEMS are available for us to review to establish an appropriate averaging time for the majority of the process units in the subpart MM category (*e.g.*, kraft recovery furnaces, lime kilns). We do not

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<sup>93</sup> Refineries, Final Rule, 80 FR 75193, 75194 (Dec. 1, 2015).

<sup>94</sup> Shueh, J. “A Whiff of Citizen Engagement Powers Pittsburgh’s New Air Pollution App,” *statescoop*, available at <http://statescoop.com/app-helps-pittsburghers-report-hazardous-pollution>. (Jan. 16, 2017)

<sup>95</sup> *Id.*

find it necessary for facilities to replace the COMS (or CPMS) systems they have invested in and are currently operating with additional investment in PM CEMS. The PM CEMS option is available to pulp and paper facilities through §63.864(e)(13) which allows facilities to petition the EPA for approval of alternative monitoring requirements including specification of an appropriate averaging time and other features for such monitoring requirements. We should also note that the commenter's information regarding EPA performance specifications for PM CEMS is out-of-date. Performance Specification 11 (PS-11) for PM CEMS was promulgated by the EPA on January 12, 2004 (69 FR 1786).

Regarding the commenter's assertion that we should adopt fence-line monitoring technology or crowd-sourced mapping, we note that the commenter appears to be referring to pollutants outside of the scope of the subpart MM source category. We infer from the commenter's reference to "noxious smells" that they are referring to total reduced sulfur (TRS) compounds, of which H<sub>2</sub>S is a component. Total reduced sulfur compounds are not regulated under subpart MM, but are reduced under the applicable kraft pulp mill NSPS (40 CFR 60 subpart BB or BBa). The subpart S NESHAP for pulp and paper production applies to HAP emissions but also results in reductions in TRS emissions from existing pulp and paper mills. With respect to the use of passive fence-line monitoring for the pollutants regulated by this rule, passive monitoring traps for long-term monitoring at outdoor ambient conditions are not currently available. The adsorbent currently evaluated for EPA Method 325 is not suitable for methanol, and the other pollutants regulated by this rule are not suited for passive monitoring.

In terms of the commenter's suggestion that the EPA create a phone app to provide a system where citizens can report episodes, we note that the EPA already has a mechanism for individuals to report a possible violation of an environmental regulation at <https://www.epa.gov/enforcement/report-environmental-violations>. However, many environmental programs have been delegated to the states, and they have primary responsibility for them. Often, it is most appropriate for an individual to contact their local city, county, or state environmental agency (or health department) rather than the EPA. The development of a community outreach app, as well as the development of a government funded monitoring network, is outside the scope of this rulemaking.

### 3.2.3 Other Developments

**3.2.3-01 Comment:** Commenter 0173 argued that the EPA must assess and require the use of safer technologies, processes, and practices now available for pulp mills to prevent and reduce the harm caused by malfunctions and resulting emission spikes.

Commenter 0173 noted that serious incidents at pulp mills and related sources have caused harm to nearby communities' health and safety, that one-third of U.S. schoolchildren go to school within the vulnerability zone of a hazardous chemical facility, such as a pulp mill<sup>96</sup> and that the people most exposed to toxic air pollution and to health and safety threats from toxic release facilities, including pulp mills, living in the most vulnerable zones around these facilities, are disproportionately communities of color and lower income communities, as shown by the

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<sup>96</sup> See Ctr. for Effective Gov't, *Kids In Danger Zones* (Sept. 2014), <http://www.foreffectivegov.org/files/kids-in-danger-zones-report.pdf>. Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 57.

EPA's own demographic analysis in this rule and outlined in a May 2014 report.<sup>97</sup> The commenter noted that the public supports the use of inherently safer, effective alternatives<sup>98</sup> and that requiring transitions to safer techniques and methods strengthens productivity and job security.<sup>99</sup>

According to commenter 0173, the recommendations of chemical safety experts generally come down to a focus on prevention and substituting less dangerous chemicals and techniques whenever possible, *i.e.*, the use of inherently safer technology, known as "IST." The commenter noted that, in a 2010 report prepared by the Center for Chemical Process Safety (The American Institute of Chemical Engineers):

Inherently Safer Technology (IST), also known as Inherently Safer Design (ISD), permanently eliminates or reduces hazards to avoid or reduce the consequences of incidents... IST is an iterative process that considers such options, including eliminating a hazard, reducing a hazard, substituting a less hazardous material, using less hazardous process conditions, and designing a process to reduce the potential for, or consequences of, human error, equipment failure, or intentional harm.<sup>100</sup>

Commenter 0173 noted that new techniques and methods have been identified or improved over the last decade for chemical facilities, including pulp mills, and those techniques are also ways of reducing toxic air pollution that the EPA should require in the pulp mills air toxics rule. The commenter stated that the EPA must consider any alternative available that would help prevent malfunctions and upsets, and reduce the harm caused by pulp mill facility malfunctions and failures. According to the commenter, the EPA has authority to and must directly account for updates in safer technologies and practices as "developments" relevant to toxic air emission control and must consider reducing the public's exposure to these source categories' toxic air pollution releases under sections 112(d)(6) and 112(f)(2) in this rule. Although the EPA also has authority to address and must work to prevent chemical disasters under section 112(r), the commenter contended that the EPA's authority to regulate toxic air pollution resulting from accidents and other dangerous incidents at pulp mills is not limited to that provision. The commenter argued that, under section 112(d)(6), the EPA must consider and account for all developments and accounting for inherently safer practices here would be consistent with other components of the proposed rule. As an example, the commenter noted that the EPA has recognized the need, in this rule, to take action to help prevent certain types of malfunction-related incidents that will violate the standards. The commenter argued that the EPA

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<sup>97</sup> See Orum, P. *et al.*, Env'tl. Justice & Health Alliance for Chemical Policy Reform, *Who's In Danger? Race, Poverty, and Chemical Disasters, A Demographic Analysis of Chemical Disaster Vulnerability Zones* (May 2014), <http://comingcleaninc.org/whats-new/whos-in-danger-report>; EPA Socioeconomic Analysis, -0226.

<sup>98</sup> A national poll by Lake Research showed that a strong majority of likely voters from both parties support new requirements to use of safer cost-effective alternatives. <http://preventchemicaldisasters.org/113-2>.

<sup>99</sup> Greenpeace. *Economic and Employment Benefits of the Chemical and Water Security Act of 2009 (H.R. 2868)*, Report Prepared for Greenpeace by Management Information Services, Inc. at 18 (July 2010), <http://www.misinet.com/publications/GreenpeaceFactSheet-0710.pdf>.

<sup>100</sup> Center for Chemical Process Safety (The American Institute of Chemical Engineers). *Final Report: Definition for Inherently Safer Technology in Production, Transportation, Storage, and Use*, Exec-1 (2010), [https://www.aiche.org/sites/default/files/docs/embedded-pdf/ist\\_final\\_definition\\_report.pdf](https://www.aiche.org/sites/default/files/docs/embedded-pdf/ist_final_definition_report.pdf). Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 56.



can and should do the same for other types of substantial air releases that can occur when there are dangerous upsets or other incidents of a large scale a pulp mill.

Commenter 0173 stated that the safer technologies, practices, and processes that can prevent toxic releases before they happen at pulp mills include the following:

- *Using alternatives to chlorine.* Significant research is available showing some pulp mills do not use chlorine and instead use safer alternatives.<sup>101</sup> Using an alternative to chlorine is a strong prevention measure for severe health and environmental impacts that can occur from a malfunction. The EPA should evaluate those developments and account for them in this rulemaking.
- *Requiring anonymous near-miss reporting.* A system for anonymous worker reporting of maintenance or potential safety problems that can lead to toxic air pollution spikes is a development that has been adopted in various industries.<sup>102</sup> For pulp mills under section 112(d)(6), to reflect “developments,” and under section 112(f)(2), to prevent unacceptable risk and assure the requisite AMOS to protect public health,” the EPA should require this and set up anonymous worker reports to go directly to the EPA and state regulators, as well as to the facility itself. The EPA could define a “near-miss” air pollution event similarly to the National Firefighter Near Miss website:

A near-miss event is defined as an unintentional unsafe occurrence that could have resulted in an injury, fatality, or property damage. Only a fortunate break in the chain of events prevented an injury, fatality or damage.<sup>103</sup>

- *Other similar techniques.* The EPA should investigate whether there are other similar techniques available of which the commenter is unaware.

**Response:** We disagree with the commenter’s argument that the EPA must require the use of available safer technologies, processes, and practices under sections 112(d)(6) and 112(f)(2) to address malfunctions and any resulting emission spikes. As stated at proposal (81 FR 97076), the EPA interprets CAA section 112 as not requiring emissions that occur during periods of malfunction to be factored into development of CAA section 112(d) standards. It

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<sup>101</sup> The following reports describe the alternatives to chlorine:

[http://www.environmentamerica.org/sites/environment/files/reports/PulpFictionFinalU.S.PIRG\\_.pdf](http://www.environmentamerica.org/sites/environment/files/reports/PulpFictionFinalU.S.PIRG_.pdf). Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 94.

<http://assets.usw.org/our-union/pulp-paper-forestry/Fix-The-Hazard-Message-7.pdf>. Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 95.

<http://www.usw.org/union/mission/industries/paper-and-forestry/resources/papered-over-safety-and-health-in-u-s-paper-mills>. Docket Item No. EPA-HQ-OAR-2014-0741-0173, Attachment 97.

<sup>102</sup> See Federal Aviation Administration (FAA) Aviation Reporting System; National Firefighters [www.firefighternearmiss.com](http://www.firefighternearmiss.com); CIRAS, (Confidential Incident Reporting and Analysis System), the confidential reporting system for the British railway industry; CHIRP, (Confidential Human Factors Incident Reporting Programme / Confidential Hazardous Incident Reporting Programme), British aviation and maritime industries; CROSS (Confidential Reporting on Structural Safety), structural and civil engineering industry/.

<sup>103</sup> <http://www.firefighternearmiss.com/About>.

should also be noted that during a period of malfunction the otherwise applicable standard applies.

Regarding the commenter's request to use alternatives to chlorine, we note that subpart MM regulates sources (*e.g.*, recovery furnaces) involved in the recovery of pulping chemicals, and chlorine is not a chemical added to the pulping process, but has in the past been more of a concern for bleaching, as indicated in the documents cited by the commenter. Bleaching processes are regulated under subpart S. Therefore, the commenter's request is not relevant to the subpart MM RTR.

Regarding the commenter's request to require anonymous near-miss reporting to prevent unacceptable risk and assure the requisite AMOS to protect public health, we note that the residual risk is considered acceptable for subpart MM, and the commenter did not provide anything specific enough to help us provide a better AMOS, or assess the cost of such measures.

Section 112(r) of the CAA is a more appropriate venue for addressing the commenter's concerns. Section 112(r) of the CAA was added in 1990 to address catastrophic releases. The EPA's regulations on catastrophic releases appear in 40 CFR part 68. We currently have a petition for rulemaking to address IST under CAA section 112(r) and part 68. Also, pursuant to EO 13650, the EPA has issued a "Request for Information" soliciting public views on the appropriateness of IST regulations and is considering pursuing rulemaking as part of the regulation, standard and guidance modernization effort called for by the executive order.

Historically, the EPA's authority to address catastrophic releases under the NESHAP program was questioned under the pre-1990 CAA (see House Energy & Commerce, Rep. 101-490, at 157(1990) (House Report); see also Senate Print 103-38, A Legislative History of the Clean Air Act Amendments of 1990, volume II, at 2743 (remarks of Representative Richardson, sponsor of House amendment on accidental releases adopted in House bill) ("Nothing in current law requires chemical or other industrial facilities handling toxic chemicals to take steps to avoid the accidental release of dangerous chemicals into the air"). To promote specific programs to address the risks associated with accidental releases, Congress added CAA section 112(r) (see, *e.g.*, House Report at 157); Senate Environment & Public Works, Rep. 101-228, at 205 – 07 (1989).

In light of the extensive history and efforts of the Agency on IST specifically and catastrophic accidents generally under the section 112(r) program, and in light of the statutory structure of CAA section 112, we view the request to enact IST provisions in this rule to be outside the scope of CAA section 112(d)(2), section 112(f)(2), and section 112(d)(6). Therefore, this comment is outside the scope of the current rulemaking.

**3.2.3-02 Comment:** Commenter 0173 argued that the EPA did not assess or lawfully account for all other significant developments that have occurred at pulp mills. The commenter pointed to a report by expert Bruce Buckheit (attachment 24 to commenter 0173's comment), which stated that the EPA's technology review was incomplete. The commenter stated that (1) the EPA did not apply the information it collected from the permit review to consider additional reductions in emissions that could and should be required as part of the review; (2) the EPA did not evaluate actual developments in technology, but looked at just a "regulatory review" of what

other jurisdictions had required; and (3) the EPA has given no valid basis for failing to do basic searches for actual technologies, practices, and processes as section 112(d)(6) requires. The commenter further noted that, in the kraft pulp mills NSPS review rulemaking, commenters submitted information on such technologies that are available that could also reduce HAP, as discussed in the Buckheit report and noted in NSPS comments (attachment 4 to commenter 0173's comment). The commenter stated that the EPA has not evaluated or addressed any of those technologies here and urged the EPA to consider all of those that would reduce HAP.

Commenter 0173 also noted a Canadian study published by the Institution of Chemical Engineers, which offers a framework for identifying and remedying different inefficiencies in kraft pulp mills.<sup>104</sup> According to the commenter, the study identifies key performance indicators and compares national averages in Canada to identify points in the system that are not operating. The commenter stated that the EPA must consider these developments and apply them in this rulemaking to strengthen requirements applicable to pulp mills.

**Response:** We disagree with the commenter's assertion that our technology review performed under CAA section 112(d)(6) was incomplete, that we failed to do basic searches, and that we only reviewed what other jurisdictions require. For the technology review, we gathered and reviewed the following information to determine if there have been developments in practices, processes, or control technologies:

- Process, equipment, and control device details from industry responses to Part III of the EPA's 2011 Pulp and Paper Sector ICR, which requested information on subpart MM processes;
- Permit limits from permits submitted with the ICR and collected from state agencies;
- Information sources compiled by state/local, national, and international agencies, including:
  - The EPA's RACT/BACT/LAER Clearinghouse (RBLC)
  - A document from the State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials (STAPPA/ALAPCO) titled *Controlling Fine Particulate Matter Under the Clean Air Act: A Menu of Options*
  - A 2015 European Commission document entitled *Best Available Techniques (BAT) Reference Document for the Production of Pulp, Paper and Board*
- Stack test data collected in the 2011 ICR for PM tabulated for the recent kraft pulp mill NSPS review;
- Stack test data collected in the 2011 ICR for soda recovery furnaces, lime kilns, and SDTs;
- Stack test data collected in the 2011 ICR for sulfite and semichemical combustion units; and
- Technical bulletins prepared by the National Council for Air and Stream Improvement, Inc. (NCASI), a major source of environmental data from the pulp and paper industry.

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<sup>104</sup> Ammara, R. *et al.*, "Equipment performance analysis of a Canadian Kraft mill. Part II: Diagnostics and identification of improvement projects," *Chemical Engineering Research and Design* (Sept. 2016).

The findings from the 112(d)(6) technology review for subpart MM were documented in a memorandum titled, *Section 112(d)(6) Technology Review for the NESHAP for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfit, and Stand-Alone Semichemical Pulp Mills*, in Docket ID No. EPA-HQ-OAR-2014-0741. Additional detailed memoranda developed as part of the technology review included:

- *Compilation of Equipment and Emissions Inventory for the Subpart MM Residual Risk and Technology Review;*
- *Review of the Air Permits for Subpart MM Sources;*
- *Review of the Continuous Opacity Monitoring System Data from the Pulp and Paper ICR Responses for Subpart MM Sources;*
- *Review of Pulp and Paper Information Collection Request Responses Pertaining to Startup and Shutdown of Subpart MM Equipment;* and
- *Projections of the Number of New and Reconstructed Process Units for the Subpart MM Technology Review.*

Regulatory options for HAP identified in the above memoranda for further analysis of costs and impacts for the 112(d)(6) technology review were discussed further in a memorandum titled, *Costs/Impacts of the Subpart MM Residual Risk and Technology Review*. The information reviewed and analysis conducted includes, and goes well beyond a review of current requirements as evidenced by the emissions data assembled and updated analyses conducted. We reviewed and built on the technological information documented for the kraft pulp mill NSPS review (including information submitted by the commenter in the context of the NSPS review).<sup>105</sup>

We disagree with the commenter's assertion that we did not apply the information from our permit review to consider additional reductions in emissions. We found that some process units now have PM permit limits more stringent than subpart MM because they are credit sources under the subpart MM PM bubble compliance alternative or as a result of other air pollution programs. There also remain many process units with permit limits equal to those required under subpart MM or greater because the process units are debit sources under the PM bubble compliance alternative. Adjusting the PM limits would impact existing facilities that participate in the PM bubble compliance approach that achieves equal or greater emissions reduction than required by subpart MM by requiring facilities, at a minimum, to embark on costly reevaluations of their subpart MM compliance approaches. Our 112(d)(6) review did not stop with a review of permit limits. We also analyzed stack emissions data for numerous process units and noted considerable variability in performance. We did not find it "necessary" to cut into the subpart MM compliance margins for existing sources because there is no actual incremental reduction in PM emissions from facilities already achieving lower PM emissions levels, and existing facilities not already meeting lower PM levels would incur technology upgrade or replacement costs when there has been no underlying change in the fundamental technology used to reduce emissions. Such technology upgrade costs were evaluated under a recent NSPS review for kraft pulp mills and were determined not to be cost-effective for existing sources that are modified in terms of \$ per ton of PM emissions reduced. For subpart MM, PM is

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<sup>105</sup> U.S. EPA. *Kraft Pulp Mills New Source Performance Review (40 CFR Part 60, Subpart BBa) Final Amendments Response to Public Comments on May 23, 2013 Proposal*. March 13, 2014. Section 2.2.

a surrogate for HAP metals, which represent only a tiny fraction of the PM emission rate. Thus, for subpart MM, the cost effectiveness (\$ per ton of HAP metals reduction) would even be less favorable, while costs would impact many more existing process units under subpart MM.

As explained in response to comment 3.2.1-02, the EPA is required under CAA section 112(d)(6) to periodically review, and revise *as necessary* (taking into account developments in practices, processes, and control technologies), *emissions standards promulgated under section 112(d)*. The Buckheit report submitted by the commenter references the data assembled for the 112(d)(6) technology review to make arguments regarding the 112(d)(2) and (3) MACT floor standard setting process which is not the subject of this rulemaking. Section 112(d)(6) does not require the EPA to base emission limits on the average of the top 12 percent or best-performing single source or to recalculate MACT floors under CAA sections 112(d)(2) and (3) for the technology review as suggested in the Buckheit report.

We reviewed the Canadian kraft pulp mill study provided by the commenter, and applaud the commenter for submitting technical information. This particular study refers to key performance indicators to improve overall energy performance for a single mill in Canada (*i.e.*, steam and water savings in the digesting, washing, bleaching, evaporation, papermaking, recausticizing, and steam production areas of the mill). The study does not provide a basis for any specific developments in practices, processes, or control technologies for reducing HAP emissions from chemical recovery combustion sources (*e.g.*, kraft recovery furnaces or lime kilns) that can be applied universally to all pulp mills.

We maintain that we have assembled and interpreted data consistent with the premise of the 112(d)(6) technology review which provides the EPA with latitude to revise standards promulgated under section 112(d) “as necessary.” After reviewing the data available for the technology review, and considering variability in emissions from existing sources and costs associated with revising the emissions standards, we did not find it “necessary” to propose revisions the subpart MM emission limits, where there have been no changes in the fundamental practices, processes, and control technologies employed for chemical recovery combustion sources. We analyzed costs and environmental impacts where we did identify changes in practices, processes, and control technologies and proposed revisions accordingly. We proposed reductions in the opacity limit for existing recovery furnaces. After considering public comments relating to the minimal incremental HAP metal reductions that would be obtained as a result of the changes to the opacity limit, the final rule does not revise the opacity limit but continues to require a 20 percent opacity corrective action level.

### **3.3 Unregulated Pollutants/Processes**

**3.3-01 Comment:** Commenters 0168 and 0173 offered opposing opinions regarding whether the EPA should have expanded the scope of sources and/or pollutants covered by subpart MM as part of the technology review. Commenter 0168 argued that the EPA has no obligation to expand the scope of the existing standards and does not in fact have statutory authority to do so. The commenter noted that the existing subpart MM standards include a comprehensive set of standards for HAP metals and for gaseous organic HAP. For control of HAP metals, the commenter noted that subpart MM standards use limitations on PM as a surrogate, a longstanding EPA practice which has been endorsed by the U.S. Court of Appeals

for the D.C. Circuit. *See, e.g., National Lime Ass'n v. EPA*, 233 F.3d 625, 634, 637 (D.C. Cir. 2000). As for the sources covered, the commenter noted that subpart MM standards are intended only to cover a subset of operations at pulp and paper mills, the "combustion" portion of the chemical recovery cycle, with other sources addressed by the subpart S NESHAP for the Pulp and Paper Industry. Thus, the commenter concluded, there is neither legal nor technical justification for considering limitations for new pollutants or for new sources as part of the CAA section 112(d)(6) review of the subpart MM standards.<sup>106</sup>

In any event, commenter 0168 noted that the EPA did conduct a thorough evaluation of subpart MM sources and emissions during the development of the existing emissions standards. According to the commenter, in the EPA's RTR proposal (81 FR 97052-53), the Agency solicited comprehensive data on subpart MM sources through the Pulp and Paper Sector ICR. The commenter stated that the Agency reviewed those data to ensure that the major pulp and paper processes and pollutants were properly identified and were included in the modeling for the residual risk review, as well as checked emissions data from the ICR against the NEI. According to the commenter, that review did not identify any reason for expanding the emission points covered or the pollutants limited in the subpart MM standards.

Commenter 0173 argued that the EPA must set emissions standards for all emitted HAP from all emission points. The commenter stated that, currently, there are uncontrolled HAP emitted by pulp mills, including mercury, dioxins/furans, and HCl, as discussed in the attached report by expert Bruce Buckheit (attachment 24 to commenter 0173's comment). According to the commenter, the EPA has found at least 100 pulp mills emit a total of about 300 lb per year (0.15 tpy) of mercury and more than 90 pulp mills emit dioxins/furans,<sup>107</sup> but noted there is currently no pulp mills standard for these pollutants, and the EPA did not propose to set any emission limits for these pollutants.

Commenter 0173 also argued that the EPA has unlawfully and arbitrarily failed to set any standard for certain emission points. The commenter stated that the review of the current NESHAP shows that gaseous organic HAP emitted from existing recovery furnaces, and from new and existing lime kilns, and SDTs, have no applicable emission limit.<sup>108</sup> The commenter also noted that the EPA failed to set any standard for HAP metal emissions from new and existing chemical recovery combustion units at stand-alone semichemical pulp mills, via a direct limit or through a surrogate PM limit. According to the commenter, the EPA decided not to set standards for recovery furnaces based on costs,<sup>109</sup> and did not acknowledge the lack of emission limits on the lime kilns, SDTs, and semichemical combustion units or consider setting such

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<sup>106</sup> To the extent that any commenters suggest that the subpart MM standards should apply to additional sources or additional pollutants, commenter 0168 believes that such assertions would not reflect new developments or new information, but rather would constitute arguments that could and should have been made during the development of the original subpart MM rule and would have had to have been challenged within 60 days of promulgation of the original subpart MM standards, in 2001, pursuant to CAA section 307(b)(1).

<sup>107</sup> *Draft Risk Assessment* (-0152) at 33-34 tbl.3.1-1.

<sup>108</sup> *Cost Impacts Memorandum* (-0148) at 2 tbl.1.

<sup>109</sup> *Id.*

limits. The commenter pointed to the Buckheit report to provide additional information on these issues.

In view of these facts, commenter 0173 argued that, since section 112(d)(1) and (d)(6) of the CAA and D.C. Circuit precedent require the EPA to set standards for all pollutants emitted by a source category, the EPA must set emissions standards for mercury, dioxins/furans, and HCl, and it must set standards for organic HAP from existing recovery furnaces, new and existing lime kilns, and SDTs, and for HAP metals from new and existing chemical recovery combustion units.<sup>110</sup>

Commenter 0173 noted that section 112(d)(1) requires the EPA to set emissions standards for all listed source categories of HAP, and every 8 years, section 112(d)(6) requires the EPA to review section 112 standards in full and determine whether it is “necessary” to change those standards. The commenter stated that section 112(d)(6) review is required partly to ensure that the Agency continually revisits the control requirements applicable to every pollutant emitted by a source category, and determine if further regulation is needed. The commenter indicated that the section 112(d)(6) review has brought the problem of currently unregulated HAP to the EPA’s attention. The commenter argued that it is now “necessary” under section 112(d)(6) to set emissions standards that control these pollutants, as the CAA directs, and it would be unlawful and arbitrary for the EPA not to do so.

Commenter 0173 also noted that since the EPA first set emissions standards for this source category, the D.C. Circuit Court has clarified that section 112(d) requires that the HAP emissions standards control every pollutant emitted by a source category and emphasized the need to set limits for all emitted HAP.<sup>111</sup> The commenter asserted that, under section 112(d)(6), the D.C. Circuit Court legal decisions governing the EPA’s regulatory responsibility are “developments” that define proper pollution controls, practices, and technologies. Thus, the commenter concluded, the EPA is legally required to account for them and set standards to limit these pollutants in the review rulemaking. The commenter argued that section 112(d)(6) does not allow any exemptions from the requirement to include emission limits for every HAP emitted by a source category, yet the EPA has not set any standard for mercury or dioxins or set any standard at all for the emission points listed above in this rulemaking, as discussed in the Buckheit report.

Commenter 0173 also argued that because the EPA has never promulgated standards for these pollutants, the EPA may not simply “revise” such standards under section 112(d)(6), but is legally required to follow the statutory test to promulgate such a standard pursuant to section 112(d)(2) and (3) (*i.e.*, “maximum achievable degree of reduction” test, including the floor). In addition, the commenter stated that, even assuming the EPA may consider costs when deciding how to “revise” a standard under section 112(d)(6), the EPA may not use costs as a justification for not setting any standard at all for a pollutant, when it discovers there is no such standard as a

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<sup>110</sup> See *Sierra Club*, 479 F.3d at 883 (quoting *National Lime*, 233 F.3d at 634).

<sup>111</sup> See *Nat’l Lime Ass’n*, 233 F.3d 625, 629 (decided Dec. 15, 2000, *am. on re’hg* Feb. 24, 2001) (holding that the EPA has a “clear statutory obligation to set emission standards for each listed HAP,” regardless of whether the best-performing sources in a given category are currently using air pollution control technology to limit their emissions.”); *Mossville Env’tl Action Now v. EPA*, 370 F.3d 1232 (2004) (same); *Sierra Club v. EPA*, 479 F.3d 875, 878 (D.C. Cir. 2007) (same); *NRDC v. EPA*, 489 F.3d 1364, 1371 (D.C. Cir. 2007) (same finding for processing plywood and composite wood products).

result of a section 112(d)(6) review rulemaking. According to the commenter, the CAA directs the EPA to set emissions standards for all emitted HAP from all emission points in a given source category under section 112(d)(3), in the form of a floor (based on the average emission limitation achieved by the relevant best-performing sources), without consideration of costs. The EPA may consider costs only at the beyond-the-floor stage.

Commenter 0173 stated that the consideration of cost that D.C. Circuit Court precedent has found to be allowed under section 112(d)(6) only applies to the revision of emissions standards that restrict HAP. According to the commenter, the D.C. Circuit Court has not held that this provision governs the test for promulgation of standards for the first time where there is no HAP restriction in place at all, nor that it allows the EPA to skip the section 112(d)(2) and (3) regulatory stage for a source category and do whatever it likes as a result of a review rulemaking. The commenter stated that section 112(d)(6) contains no test to use to set standards for the first time and does not supplant the test applied in section 112(d)(2) and (3).

According to commenter 0173, in prior section 112(d)(6) rulemakings, the EPA has similarly and repeatedly found developments like the ones described above, and determined that it was necessary to set standards pursuant to section 112(d)(2) and (3) after reviewing the standards under its section 112(d)(6) authority, and that the EPA had a “clear statutory obligation to see emissions standards for each listed HAP.”<sup>112</sup> Thus, the commenter concluded, it would be unlawful and inconsistent with the EPA’s policy and recent practice regarding the need to set limits for unregulated pollutants and sources, but not to set limits here for mercury and dioxins and unregulated emission points, and thus arbitrary and capricious.

Commenter 0173 stated that the EPA has given no justification for failing to regulate mercury and dioxins from pulp mills. According to the commenter, mercury is a HAP metal, but the only standard restricting HAP metals is a PM standard, using PM as surrogate, and PM is not a valid surrogate for mercury, as the EPA is well aware based on the science.<sup>113</sup> Therefore, the commenter stated, there is no mercury standard. The commenter similarly noted that, although there is a methanol-surrogate standard for gaseous organic HAP, that could not possibly satisfy the CAA because methanol is not a valid surrogate for dioxins/furans.<sup>114</sup> According to the commenter, even if the EPA had previously set surrogate-based standards for these pollutants, which it did not do, there has been a case law development that provides a clear test for when the

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<sup>112</sup> See, e.g., Wool Fiberglass Final Rule, 80 FR 45,280, 45,311-12 (July 29, 2015) (“Further, CAA section 112(d)(6) itself provides that the agency must review and revise “as necessary.” The “as necessary” language must be read in the context of CAA section 112(d)(6), which focuses on the review of developments that have occurred since the time of the original promulgation of the MACT standard and, thus, can be used as an opportunity to correct flaws that existed at the time of the original promulgation.”); “in several recent rulemakings we have chosen to fix underlying defects in existing MACT standards under CAA sections 112(d)(2) and (3), provisions that directly govern the initial promulgation of MACT standards” (citing examples)).

<sup>113</sup> See, e.g., Area Source Boilers Final Rule, 75 FR 31896, 31904 (June 4, 2010) (using PM as a surrogate only for “non-mercury metals,” and explaining: “We looked at mercury separately from other metallic urban HAP due to its different chemical characteristics and applicable controls.”).

<sup>114</sup> See 69 FR 21214: “Wet and dry air pollution control systems are generally not considered to be dioxin/furan control systems because their primary function is to remove metals and/or total chlorine from the combustion gas. They generally do not remove dioxin/furans from the incinerator flue gas unless they are used in tandem with carbon injection systems or carbon beds.”



EPA may regulate via a surrogate, which the Agency would have to account for now.<sup>115</sup> The commenter stated that the EPA has not met the test to show how any pollutant is or could be a surrogate for mercury or dioxins/furans.

**Response:** The EPA is required under CAA section 112(d)(6) to periodically review, and revise **as necessary** (taking into account developments in practices, processes, and control technologies), **emissions standards promulgated under section 112(d)** (emphasis added). Regarding the scope of the subpart MM technology review, the EPA acknowledges that standards for certain combinations of pollutants and processes in the subpart MM source category have not been promulgated according to CAA section 112(d)(2) and (3). We agree that the EPA does not have any obligation to expand the scope of the existing standards under CAA section 112(d)(6), and we do not look to CAA section 112(d)(6) for authority to set additional standards within a source category. The authority to set additional standards within a source category comes from CAA section 112(d)(2) and (3). Though the EPA has discretion to develop standards under 112(d)(2) and (3) for previously unregulated pollutants at the same time as the Agency completes the section 112(d)(6) review, nothing in section 112(d)(6) expressly requires the EPA to do so as part of that review. The compressed schedule for the rulemaking, due to the court-ordered deadline, did not make it reasonable to appropriately evaluate new standards for unregulated pollutants and processes. As noted by the commenter, establishing emissions standards under 112(d)(2) and (3) involves a different analytical approach than reviewing emissions standards under 112(d)(6). In short, the EPA's reading of the requirement in section 112(d)(6) is that the EPA is to review emissions standards that have been promulgated and is not obligated as part of that review to address any pollutants or processes that are not currently subject to standards, though the EPA could as a matter of discretion choose to do so at the same time and in the same rulemaking process as the section 112(d)(6) review. The EPA is not taking any action at this time with respect to the unregulated pollutants or processes, though the EPA might choose to do so in the future after assembling the data and information needed to conduct the section 112(d)(2) and (3) analyses.

Judicial review of the final subpart MM MACT standards under CAA section 307(b)(1) was available for parties filing a petition for review in the U.S. Court of Appeals for the D.C. Circuit for 60 days following promulgation of the rule (*i.e.*, by March 13, 2001). No petitions for judicial review challenging the originally promulgated subpart MM standards were received.

The commenter refers to mercury, dioxins/furans, HCl, PM as a surrogate for HAP metals, and gaseous organic HAP. Estimated emissions of these pollutants were included in the risk modeling file for the subpart MM processes from which they are emitted, including processes unregulated for these pollutants. We found risks associated with the subpart MM category to be acceptable in the absence of additional section 112(d)(2) and (3) standards for unregulated processes and pollutants.

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<sup>115</sup> In *Sierra Club v. EPA*, 353 F.3d 976, 984 (D.C. Cir. 2004), the D.C. Circuit explained that a surrogate may only be reasonable if it meets three conditions: (1) the target pollutant(s) must invariably be present in the surrogate; (2) the control technology used to control the surrogate must indiscriminately capture both the surrogate and the target pollutant(s); and (3) control of the surrogate must be "the only means by which facilities 'achieve' reductions in" the target pollutant(s).

Further, we note that HCl was addressed when the original subpart MM standards were developed. The EPA determined according to CAA section 112(d)(4) that no further control of HCl is necessary because HCl (a health threshold pollutant) is emitted from recovery furnaces at levels below the threshold value within an AMOS (63 FR 18756 and 18765-18768, April 15, 1998).

## 4. Startup, Shutdown, and Malfunction

### 4.1 Authority for Removal of the SSM Exemption

**4.1-01 Comment:** Multiple commenters noted that the proposed rule contains a number of changes that affect mills' compliance obligations during periods of SSM. Commenter 0173 supported the proposed changes, while four commenters (0164, 0168, 0170, 0171) objected to the proposed changes.

When the EPA promulgated the current subpart MM standards, the EPA incorporated provisions of the NESHAP General Provisions that exempted sources from compliance with emission limitations during periods of SSM, and required sources to prepare and implement an SSM plan which includes practices to minimize emissions during those periods. See 40 CFR 63.6(e)-(h) and §63.866(a), and subpart MM Table 1. In its 2008 decision in *Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008), the U.S. Court of Appeals for the D.C. Circuit vacated portions of two provisions in the EPA's CAA section 112 regulations governing the emissions of HAP during periods of SSM. Specifically, the Court vacated the SSM exemption contained in 40 CFR 63.6(f)(1) and 40 CFR 63.6(h)(1), holding that under section 302(k) of the CAA, emissions standards or limitations must be continuous in nature and that the SSM exemption violates the CAA's requirement that some CAA section 112 standards apply continuously. In the proposed rule, the EPA stated that, to be consistent with the 2008 *Sierra Club* decision, the EPA was proposing to eliminate the SSM exemption in subpart MM, propose standards that apply at all times, and make several revisions to Table 1 (the General Provisions Applicability table), including the requirement to develop and implement an SSM plan. (81 FR 97075)

Commenter 0173 argued that it is legally required and necessary under section 112(d), including section 112(d)(6), for the EPA to remove the SSM exemptions for pulp mills as it has proposed to do. The commenter stated that the CAA requires standards apply continuously, and D.C. Circuit Court precedent since the prior standards makes that clear to the EPA.<sup>116</sup> The commenter contended that the EPA must remove all such exemptions when it finalizes this action.

The other commenters argued that the EPA's proposal to require sources to meet the same emission limitations during periods of SSM represents an unauthorized change to existing MACT standards. Commenters contended that it is not the product of the technology review, it is not required by case law, and it is inconsistent with decades of EPA practice and judicial interpretations of NESHAP and NSPS. Commenters stated that the proposal instead reflects an incorrect interpretation of legal precedent and an EPA policy preference to ignore the incapability of MACT control technology to meet the numerical emission limitations during some periods of operation, even at the best-performing mills. Commenters argued that the D.C.

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<sup>116</sup> *Sierra Club v. EPA*, 551 F.3d 1019, 1027-28 (D.C. Cir. 2008) (“Congress has required that there must be continuous section 112-compliant standards.”; “Congress ... did not authorize the Administrator to relax emission standards on a temporal basis.”); see also H.R. Rep. No. 95-294, at 92 (1977), reprinted in 1977 U.S.C.C.A.N. 1077, 1170 (“continuous” emissions standard requirement does not allow merely “temporary, periodic, or limited systems of control”).

Circuit's *Sierra Club* decision neither compels nor supports the EPA's adoption of the proposed SSM provisions.

Commenter 0170 argued that the *Sierra Club* decision interpreted the NESHAP General Provisions; it did not by its terms address what the EPA may or may not include in category-specific MACT standards. In contrast, the commenter stated that opinions where the Court *was* looking at source category-specific MACT standards have emphasized the need for those standards to recognize and accommodate higher emission levels that occur at times other than normal operations.<sup>117</sup> Commenter 0168 concurred with this argument and also noted that the EPA, for over 30 years, had recognized that technology-based emissions standards need to address the fact that even the best available control technology may not be able to meet emission limitations, derived from data on steady-state performance, during SSM periods.<sup>118</sup>

Commenter 0168 further noted that the subpart MM NESHAP was never judicially challenged, and the time for such a challenge under CAA section 307(b) has long passed. Even if there were some portion of an opinion in one of the many cases challenging other NESHAPs that was contrary to the approach the EPA took in promulgating the subpart MM NESHAP, the commenter argued that would not provide a means nor a justification for reopening the subpart MM standards that were never challenged on that grounds. See 40 CFR 63.6(e)-(h) and §63.866(a), and subpart MM Table 1 and, *e.g.*, *Sierra Club v. EPA*, 353 F. 3d 976, 986 (D.C. Cir. 2004) (MACT standards judged on the adequacy of the EPA's explanation in the particular rulemaking, not on what the EPA did based on a different record in a different rulemaking). In any event, the commenter concluded that none of the holdings in those other cases undercuts the EPA's determination to include the current SSM provisions in subpart MM, the technical and policy basis for which was well-established when they were adopted.

Commenter 0170 also argued that the *Sierra Club* decision did not say that the same emission limitations that the EPA has derived for normal operations must also apply during SSM events. According to the commenter, while a blanket, open-ended exemption from any standard under section 112 is inconsistent with the *Sierra Club* panel's holding that, for section 112 maximum achievable control technology standards, "there must be continuous section 112-compliant standards" (551 F.3d at 1027), *Sierra Club does not* preclude the EPA from applying different standards during SSM events than apply during normal operations. In fact, the commenter contended, the opinion acknowledges that section 302(k)'s "inclusion of [the] broad phrase" "**any requirement** relating to the operation or maintenance of a source to assure continuous emission reduction" in the definition of "emission standard" suggests that the EPA

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<sup>117</sup> See, *e.g.*, *Sierra Club v. EPA*, 167 F.3d 658, 665 (D.C. Cir. 1999) (Section 112(d) standards based upon the performance of the best-performing facilities are supposed to represent "the emissions control that is achieved in practice" by the best performers; this means that the best-performing facilities will not violate the standards, and that will "only result[] if 'achieved in practice' is interpreted to mean 'achieved under the worst foreseeable circumstances.'"); *Cement Kiln Recycling Coalition v. EPA*, 255 F.3d 855 (D.C. Cir. 2001) (the Court choosing to vacate rather than simply remand MACT standards, based in part on the Agency's failure to exempt hazardous waste combustors from numerical emission limits during SSM periods and the Court's "similar doubts about EPA's decision to require sources to comply with standards even during openings of emergency safety valves caused by events beyond the sources' control." *Id.* at 872).

<sup>118</sup> See, *e.g.*, *Essex Chemical Corp. v. Ruckelshaus*, 486 F.2d 427, 432 (D.C. Cir. 1973), *cert. denied*, 416 U.S. 969 (1974); *National Lime Ass'n v. EPA*, 627 F.2d 416, 430-31 (D.C. Cir. 1980).

can establish MACT standards consistent with CAA section 112 “without necessarily continuously applying a single standard.”<sup>119</sup> The commenter also noted that an emission limitation can be “continuous” over some period of time or condition, but not necessarily all periods of time.<sup>120</sup>

Commenter 0168 indicated that the problem with the General Provisions SSM exemption, in the Court’s eyes, was that it allowed sources to be exempt from any standard at all, and that it was not derived (by the EPA’s admission) applying the factors in CAA section 112(d) or 112(h).<sup>121</sup> See *id.* at 1027-28, 1030. The commenter contended that the opinion in the 2008 *Sierra Club* case does not say that the same standard must apply at all times; in fact, it says specifically that the CAA does not require that. See 551 F.3d at 1021, 1027. According to the commenter, the decision also recognized that work practice standards that apply during SSM events could (if they meet the substantive criteria of section 112) result in a set of section 112-compliant standards for the source that apply at all times. See 551 F.3d at 1027. In other words, the commenter argued, the judicial opinion that the EPA cites as justification for eliminating recognition of the effect of SSM events in the subpart MM standards explicitly allows the EPA to address those effects, through alternative numerical limitations that apply during SSM events or through work practice standards that apply during such periods.<sup>122</sup>

Commenter 0170 stated that there is ample precedent for the EPA applying a different standard during SSM events. According to the commenter, the language that the D.C. Circuit considered dispositive in interpreting the EPA’s standards-setting authority under section 112 — the statement, in the CAA section 302 definition of “emission limitation” or “emission standard,” that it is a requirement that “limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis” — has been in the statute since 1977. The commenter noted that, for over 30 years thereafter, the EPA has not required sources to meet NSPS emission

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<sup>119</sup> 551 F.3d at 1027 (emphasis added). “Indeed, this reading is supported by the legislative history of section 302(k).” *Id.* See also *id.* at 1021 (“accepting that ‘continuous’ for purposes of the definition of ‘emission standards’ under CAA section 302(k) does not mean unchanging”); *id.* (referring to “the CAA’s requirement that **some** section 112 standard apply continuously”) (emphasis added). Moreover, because it was addressing only a generic SSM exemption, the *Sierra Club* decision did not consider whether EPA, in the context of individual categorical standards, could determine that it is infeasible to apply the same limits, or any limits at all on the mass or concentration of pollutants emitted, during SSM events, or that it would lead to absurd results to do so.

<sup>120</sup> The EPA has used this term in just that manner: In a 1982 memorandum on the meaning of “continuous compliance,” the EPA explained, “sources are required to meet, without interruption, all applicable emission limitations and other control requirements, unless such limitations specifically provide otherwise.” Memorandum from K. Bennett, EPA Assistant Administrator, to Regional Air Directors, *Subject: Definition of “Continuous Compliance” and Enforcement of O&M Violations* (June 21, 1982), at 1.

<sup>121</sup> The EPA told the Court that the General Provisions SSM exemption struck down in *Sierra Club* was not an alternative standard based on the work practice standard authority. See 551 F.3d at 1028. Indeed, the EPA argued in that case that section 112(h) was irrelevant to its authority to exempt excess emissions during SSM events. *Id.* at 1030 (Randolph, J. dissenting).

<sup>122</sup> Commenter 0168 stated that they are not suggesting, as the EPA implied at 81 FR 97076, that accounting for malfunctions in the standards means the EPA has to set numeric emission limitations, applicable at all times, that sources could meet during malfunction events. To the contrary, the commenter stated they are merely arguing that the EPA can promulgate emissions standards that apply to normal, steady-state operations and that reflect the performance of MACT technology during such periods, providing for alternative standards that apply during other operating (SSM) periods.

limitations under CAA section 111 established for normal operations during SSM events. See 40 CFR 60.8(c). In fact, the commenter pointed out, Congress enacted the “continuous basis” language in section 302(k) with the knowledge that the EPA’s emissions standards under section 111 exempted SSM periods. The commenter argued that there is nothing in the legislative history of the 1977 amendments to the CAA that suggests Congress intended to overturn that practice.<sup>123</sup>

Moreover, commenter 0170 noted that court decisions both before and after the CAA Amendments of 1977, some of which are cited below, have affirmed the appropriateness of including special SSM provisions in standards issued under section 111—despite the “continuous basis” language in the definition of “emission limitation.” Similarly, the commenter argued that there is nothing in the legislative history of the CAA Amendments of 1990 that suggests Congress meant something completely different when it used the same defined terms, “emission standard” and “emission limitation,” in directing the EPA, in amendments to section 112, to establish MACT standards.

Commenter 0170 also argued that the *Sierra Club* decision did not address whether the EPA could use a “design, equipment, work practice or operational standard,” as authorized under CAA section 112(h) and included in the definition of “emission limitation” and “emission standard” in CAA section 302(k), in lieu of a numerical emission limitation during SSM events. The commenter noted that the EPA told the Court that the General Provisions SSM exemption struck down in *Sierra Club* was *not* an alternative standard based on the work practice standard authority. See 551 F.3d at 1028. Indeed, the commenter noted, the EPA argued in that case that section 112(h) was irrelevant to its authority to exempt excess emissions during SSM events. *Id.* at 1030 (Randolph, J. dissenting). Thus, the commenter concluded that the EPA cannot hide behind the *Sierra Club* decision as a justification for ignoring an inability of even the “best performers” to achieve during SSM events the emission limitations the EPA has established for normal operations.

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<sup>123</sup> Rather, the “continuous basis” language inserted in 1977 related to a debate in Congress about whether sources should be allowed to use temporary or intermittent pollution control technologies, as the D.C. Circuit recognized in *Sierra Club v. EPA*, 551 F.3d at 1027, citing *Kamp v. Hernandez*, 752 F.2d 1444, 1452 (9th Cir.1985). See also Conference Report on H.R. 6161 (the CAA Amendments of 1977), H. Rep. No. 95-564 (August 3, 1977) at 129 (requirement to use “continuous emission controls” “clarifies that intermittent or alternative control measures are not permissible means of compliance”), 172; S. Rep. No. 94-717 (March 29, 1976) at 78 (definition of “emission limitation” being amended to clarify that “[i]ntermittent controls or dispersion techniques are unacceptable as a substitute for continuous control of pollutants” and contrasting intermittent controls, which vary based on predicted changes in pollutant dispersion due to meteorological predictions, with continuous controls such as flue-gas cleaning equipment); see also *Nat’l Lime Ass’n v. EPA*, 627 F.2d 416, 434 n.54 (D.C. Cir. 1980) (“The ‘intermittent’ controls that concerned Congress were any of those which entailed temporary reductions in emissions when weather conditions were poor.”). The language about “continuous reduction” that Congress added to the definition of “emission standard” did not address what emission limitations apply during SSM periods, nor the EPA’s established practice of exempting excess emissions during SSM events from the performance standards applicable to normal operations. In fact, the legislative history indicates Congress was aware that alternative emission limitations might at times be necessary, even though the emission limitations were established based on the capability of “continuous controls” like scrubbers. See, e.g., S. Rep. No. 94-717 at 78 (“It is recognized that the source controls may not be available to achieve the full reduction required of a particular source under particular circumstances. In such case, supplementary programs can and should be developed. But this flexibility occurs only after imposition of the continuous emission limitation.”).

Commenter 0168 argued that the proposal lacks any meaningful assessment of the extent to which the EPA's authority under CAA section 112(h) can be used to set design, equipment, work practice, or operational standards in lieu of the numerical emission limitations for those periods of operation, even though the EPA has acknowledged the difficulty of sampling or monitoring emissions during such events.

Commenters 0168 and 0170 argued that the approach the EPA proposed for subpart MM would not establish "continuous section 112-compliant standards" that the *Sierra Club* decision concluded are required. *See* 551 F.3d at 1027. The commenters pointed out that, under CAA section 112(d)(2), MACT emissions standards must be "achievable," and under CAA section 112(d)(3), those limitations must on average be "achieved" by the best performers—neither of which is true of emission limitations that ignore the effect of SSM events on compliance with the numerical limits contained in the standards.

According to commenter 0170, an emission limitation that applies during SSM events does not meet the requirement of CAA section 112(d)(2) that "emission standards" under that section be "achievable" if, in fact, the EPA has not demonstrated that the limitation is "achievable" with available technology, "taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements." Similarly, the commenter argued that an emission limitation that applies during SSM events has not been demonstrated to be "achieved" by the best-performing 12 percent of units in the category under CAA section 112(d)(3), unless the EPA can show that those best performers actually meet that emission limitation during SSM events. The commenter contended that the proposed rule would not establish "continuous section 112-compliant standards" because, as discussed below, the EPA has not demonstrated that the emission limitations that would be established by the proposed rule would comply with section 112 when applied during SSM events.

Commenter 0170 asserted that this plain-language reading of the applicable statutory requirements is echoed by extensive case law. The commenter noted that courts have long recognized that a "technology based standard discards its fundamental premise when it ignores the limits inherent in technology."<sup>124</sup> As an example, the commenter noted that the D.C. Circuit recognized, in *Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 375, 398 (D.C. Cir. 1973), a decision reviewing standards under CAA section 111, that "'start-up' and 'upset' conditions due to plant or emission device malfunction, is an inescapable aspect of industrial life and that allowance must be made for such factors in the standards that are promulgated." *Id.* at 399. Similarly, in *Essex Chem. Corp. v. Ruckelshaus*, 486 F.2d 427, 432 (D.C. Cir. 1973), *cert. denied*, 416 U.S. 969 (1974), another section 111 case, the commenter noted that the D.C. Circuit held that SSM provisions are "necessary to preserve the reasonableness of the standards as a whole." *Id.* at 433. In *National Lime Ass'n v. EPA*, 627 F.2d 416 (D.C. Cir. 1980), another case reviewing emissions standards promulgated under CAA section 111, the commenter noted that the D.C. Circuit held that the CAA requirement that NSPS be "achievable" means that the standards must be capable of being met "on a regular basis," including "under most adverse

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<sup>124</sup> *NRDC v. EPA*, 859 F.2d 156, 208 (D.C. Cir. 1988). *See Nat'l Ass'n of Clean Water Agencies v. EPA*, 734 F.3d 1115, 1158 (D.C. Cir. 2013) ("[I]t is reasonable to expect that the incinerator on which the MACT floors are based should be able to 'achieve' the MACT floor 'in practice,' which it could not do unless 'achieved in practice' meant 'achieved under the worst foreseeable circumstances.'").

circumstances which can reasonably be expected to recur,” including during periods of SSM. 627 F.2d at 431 n.46.

Commenter 0170 noted that courts have reached a similar conclusion when considering the analogous Clean Water Act (CWA) requirements that the EPA establish technology-based effluent limitations based on the best available control technology. In one such case, the commenter noted that the Court held that, where the EPA knew that there would be periods where a discharger, even with “exemplary use of” the identified best technology, would exceed the effluent limitations because of conditions “beyond the control of the permit holder,” the EPA had violated the CWA by failing to provide an “upset provision” to address those periods. *Marathon Oil Co. v. EPA*, 564 F.2d 1253, 1273-74 (9th Cir. 1977). *See also, e.g., NRDC v. EPA*, 859 F.2d at 207 (distinguishing between technology-based effluent limitations, where some provision for “upsets” is required, and water-quality-based effluent limitations, which are tied to achieving water quality standards rather than based on available technology, and, therefore, need not include an upset provision).<sup>125</sup>

Commenter 0170 argued that, as explained above, *Sierra Club v. EPA* did not address this precedent, and the 1977 CAA Amendments arguably support the conclusion that emissions standards need to deal with the inability of a source to meet the normal emission limitations during particular circumstances. Moreover, the commenter noted that the *National Lime Ass’n* decision discussed above, which relies in part on the cases the EPA referenced in the preamble, and which directly addresses the need for emission limitations that address reasonably anticipated adverse circumstances, postdates the CAA Amendments of 1977 by 3 years.

Commenter 0170 reiterated that the *Sierra Club* decision explicitly does not prevent the EPA from adopting emissions standards for SSM periods that are different from those required during periods of normal operation, nor does the *Sierra Club* decision mean that the EPA is barred from using a “requirement relating to the operation or maintenance of a source to assure continuous emission reduction” as the emissions standard that applies during such events. *See* 551 F.3d at 1027. According to the commenter, the *Sierra Club* decision only rejected the EPA’s assertion that it had discretion to decide not to impose *any* emissions standard covering SSM periods. *See id.* at 1027-28, 1030 (noting that the EPA was not claiming that the General Provisions SSM exemption was either an “emission standard” under CAA section 112(d) or a

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<sup>125</sup> The *Weyerhaeuser Co. v. Costle* decision that the EPA cites in the preamble to the proposed rule, 590 F.2d 1011 (D.C. Cir. 1978), does not support the EPA’s position. *See* 81 FR 97076. In that case, the Court was discussing a “technology-forcing” standard, rather than one, like MACT, that is to be based on what is already being “achieved” or has been demonstrated to be achievable. Also, the SSM events that the EPA acknowledges are expected to occur at sources subject to the proposed standards are a far cry from the unusual “uncontrollable acts of third parties,” such as strikes, sabotage, operator intoxication, or insanity” that the Court was considering in the passage quoted by EPA, *see id.* Industry is not requesting that the NESHAP provide relief from numerical emission limitations during those unusual types of events. Moreover, most of the cited events would not even constitute “malfunctions,” as the EPA defines that term in 40 CFR 63.2 and in other policy statements, because they are the result of deliberate actions (*e.g.*, deciding to continue to operate with inadequate staffing during a strike) or would constitute “careless operation” (*e.g.*, operator intoxication). Perhaps most importantly, the *Weyerhaeuser* decision came long before *NRDC v. EPA*, 859 F.2d 156 (D.C. Cir. 1988) which, as noted above, affirmed the need for an upset provision to address circumstances where compliance with effluent limitations is impossible through no fault of the permittee, and which endorsed *Marathon Oil*.



“design, equipment, work practice, or operational standard” under section 112(h)).<sup>126</sup> Thus, despite the EPA’s indications to the contrary, the commenter concluded that the *Sierra Club* decision expressly recognized that different standards, including non-numerical standards, may (and, in some cases, must) apply during non-standard operating conditions, such as SSM events.

Commenter 0170 also noted that a decision that has dealt directly with how the EPA should address SSM issues in setting categorical standards pursuant to section 112, *Cement Kiln Recycling Coalition v. EPA*, 255 F.3d 855 (D.C. Cir. 2001), is consistent with *Essex Chemical* and the other NSPS cases described above. According to the commenter, in *Cement Kiln Recycling Coalition*, the D.C. Circuit, in deciding whether to simply remand MACT standards (for inadequacies unrelated to SSM issues) or vacate the standards, chose vacatur. The commenter stated that it did so in part because of the Court’s concerns about the EPA’s failure to exempt hazardous waste combustors from numerical emission limits during SSM periods, instead of “permitting sources to return to compliance by following the steps of a startup, shutdown, and malfunction plan filed with the Agency....” The commenter stated that the Court had “similar doubts about the EPA’s decision to require sources to comply with standards even during openings of emergency safety valves caused by events beyond the sources’ control.” *Id.* at 872. The commenter noted that the EPA shared these concerns: In response to that decision, the EPA revised the rule to exempt facilities from the limitations during SSM events. See 40 CFR 68.1206(b)(1), as adopted at 67 FR 6792, 6798, 6813 (February 13, 2002).

**Response:** We disagree with the commenter’s suggestion that *Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008) is not relevant because it addressed the SSM exemption in the General Provisions rather than source category-specific MACT standards. The holding in *Sierra Club* that emissions limitations under section 112 must apply continuously and meet minimum stringency requirements, even during periods of SSM, is clearly applicable to source category-specific MACT standards. As we explained in the proposal, our SSM-related rule revisions are in response to the *Sierra Club* Court’s vacatur of the SSM exemption in 40 CFR 63.6(f)(1) and 40 CFR 63.6(h)(1), (81 FR 97075). When incorporated into section 112(d) regulations for specific source categories, these two provisions exempted sources from the requirement to comply with otherwise applicable MACT standards during periods of SSM. Subpart MM, Table 1 incorporated several General Provisions related to SSM, specifically including 40 CFR 63.6(f)(1) and 40 CFR 63.6(h)(1). The Court’s vacatur rendered those provisions null and void prior to this rulemaking. The mandate implementing the Court’s decision was issued on October 16, 2009, at which time the vacated SSM provisions were clearly no longer in effect, and standards in subpart MM applied at all times, including periods of SSM. The rule changes to remove the vacated SSM provisions from subpart MM are ministerial actions by the EPA to reflect the vacatur by the court.

We do not claim that the *Sierra Club* decision constrains our authority to set different standards, including work practice standards under section 112(h), for periods of startup and

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<sup>126</sup> The statement in the majority opinion that “Congress gave no indication that it intended the application of MACT standards to vary based on different time periods,” 551 F.3d at 1028, (1) is contradicted by other statements in the opinion, referenced above, that a MACT standard need not continuously apply a single emission limitation, (2) is *dicta*, because that was not the situation presented by the challenged regulations and argued by EPA, (3) ignores the extensive case law about technology-based limitations referenced above, and (4) does not in any event say that the CAA precludes the EPA from adopting different emission limitations that apply during SSM events.

shutdown. We have evaluated whether different standards during startup/shutdown periods are justified, and, in this case, we have concluded different standards are not warranted for subpart MM. We are applying the existing subpart MM MACT standards to periods of startup and shutdown because ample flexibility is provided in the rule to accommodate these periods.

As part of this RTR, we reviewed numerous continuous opacity monitoring datasets that included data for periods of startup and shutdown, and we found that most of the affected units have achieved and are able to comply with the opacity operating limits (including the opacity monitoring allowance) at all times. An opacity monitoring allowance was retained in the final rule to provide flexibility to accommodate process variability, including periods of startup and shutdown. In addition to retaining an opacity monitoring allowance demonstrated to be achieved, the EPA also retained the original rule's 35 percent opacity limit (including the original 20 percent opacity corrective action level) for existing recovery furnaces. As a result of our cost analysis for the final rule, we did not finalize our proposal to reduce the 35 percent opacity limit. The 35 percent opacity limit in combination with the 2 percent monitoring allowance for recovery furnaces was demonstrated to be achieved by all recovery furnaces for which data were available (nearly every recovery furnace in the U.S.). The EPA did not propose, and is not finalizing, changes to the 20 percent opacity limit for ESP-controlled lime kilns other than a reduction in the opacity monitoring allowance from 6 percent to 3 percent, based on the level that all kilns for which the EPA has opacity data have achieved.

In response to comments on the proposed addition of 3-hour average ESP parameter monitoring, including concerns relating to startup and shutdown, the EPA has decided not to finalize the proposed ESP parameter monitoring requirement. Instead, the EPA is finalizing a requirement to maintain proper operation of the ESP AVC. This requirement ensures continuous applicability of a standard for ESP-controlled sources.

In order to accommodate startup and shutdown for wet scrubber-controlled sources, the EPA proposed and is finalizing that only one of two wet scrubber parameters applies during startup/shutdown. The wet scrubber pressure drop limit may be difficult to achieve during startup and shutdown. Therefore, the final rule allows ongoing compliance to be demonstrated using scrubber liquid flow rate instead of both scrubber liquid flow rate and pressure drop during startup/shutdown. As allowed in the original rule, a violation is not incurred until six or more wet scrubber parameter exceedances occur in a semiannual period. Corrective actions are required for all exceedances.

The EPA did not propose and is not finalizing changes specific to regenerative thermal oxidizer (RTO) temperature monitoring provisions. However, changes are being finalized for all parameter monitoring provisions that ensure sufficient flexibility for startup and shutdown periods. The EPA proposed and is finalizing the addition of rule language to clarify that corrective actions and violations are triggered during times when spent liquor solids or lime mud is fed (as applicable). In addition, §63.864(k)(1) acknowledges that corrective action for monitoring exceedances can include completion of transient startup and shutdown conditions as expeditiously as possible. The EPA is not finalizing the proposed removal of §63.864(k)(3), which states that no more than one non-opacity monitoring exceedance will be attributed to a given 24-hour period. Retention of this provision reduces the possibility for one event to trigger multiple exceedances.

The flexibilities described in the previous paragraphs ensure that applying the same standards at all times, including startup and shutdown, is technically feasible for subpart MM. For additional responses to comments concerning standards during periods of startup and shutdown, see the discussion in section 4.2 below.

We disagree with the commenter's suggestion that the existence of an SSM exemption in rules implementing section 111 in 1977 when Congress enacted the "continuous basis" language in the definition of "emission standard" is evidence that Congress approved of that regulatory SSM exemption. The legislative history cited by the commenter does not support that Congress was aware or approved of that exemption.

For periods of malfunction, the EPA provided a detailed justification for its approach to malfunctions in the preamble to the proposed rule, (81 FR 97076-77). As the D.C. Circuit noted in *Sierra Club v. EPA*, 167 F.3d 658 (D.C. Cir. 1999), the phrase "average emissions limitation achieved by the best performing 12 percent of units" in section 112 of the CAA "says nothing about how the performance of the best units is to be calculated." *Id.* at 661. Congress has not directly addressed the issue of whether emissions that occur during periods of malfunction must be taken into account in calculating the performance of the best units and the EPA's approach to malfunctions is reasonable for the reasons set out in the preamble to the proposed rule. The EPA further explained that the performance of units that are malfunctioning is not reasonably foreseeable and cited case law supporting its approach to malfunctions. *See Sierra Club* at 665 (discussing need to take into account the worst reasonably foreseeable performance) and *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."). Although the EPA bases emissions standards on different manners of operations and circumstances, the EPA only takes into account conditions that are "foreseeable" and "which can reasonably be expected to recur." *Sierra Club*, 167 F.3d at 665; see also *Nat. Lime*, 627 F.2d. at 431, n.46. Virtually no malfunction is foreseeable in terms of its nature, timing or effect on emission levels and no operator knows if or when a malfunction could recur. The U.S. Court of Appeals for the D.C. Circuit upheld the EPA's approach to malfunctions in *U.S. Sugar Corp. v. EPA*, 830 F.3d 579, 606-610 (2016).

With respect to commenters' suggestion that the EPA consider work practice standards, the decision to use a work practice standard is wholly within the discretion of the EPA. See CAA section 112(h) ("[T]he Administrator may, in lieu [of a numeric standard], promulgate a design, equipment, work practice, or operational standard, or combination thereof."). In exercising the option to establish a work practice standard, that standard must "**in the Administrator's judgment** [be] consistent with the provisions of subsection (d) or (f)." CAA section 112(h)(1) (emphasis added). These subsections make clear that the EPA is to base emissions standards on the emission levels already achieved by the best performing sources and to ensure that public health is protected, as applicable. This means that work practice standards, although written in non-numeric form, must still satisfy statutory requirements such as those applicable to MACT standards, including the requirement to be no less stringent than the MACT floor.

It is just as difficult to establish a work practice standard for malfunctions that can approximate the level of emission reduction achieved by the best performing sources during malfunctions as it would be to factor emission levels that occur during malfunctions into the

numeric standards. For example, the EPA would have to design a single work practice standard that applies equally to a smelt tank explosion as it does to innumerable types of operator error, computer glitches or a myriad of other unknown events, or alternatively create innumerable work practice standards for smelt tanks.

Based on this rulemaking record, it would be clearly inappropriate to set a work practice standard for malfunctions in lieu of the otherwise applicable numerical emission limit. We also note that we would consider any response to violations caused by a malfunction on a case-by-case basis through the exercise of enforcement discretion. Regarding startup and shutdown periods, we also did not replace the emission limits with a work practice standard, because the final rule contains sufficient flexibility in the ongoing monitoring provisions to make application of the same standards at all times feasible. Thus, contrary to the commenter's argument, we have determined that the standards that apply during startup and shutdown periods will establish "continuous section 112-compliant standards" that the *Sierra Club* decision concluded are required. Furthermore, the commenters have not suggested any specific work practices that could be used in place of numeric emission limits during periods of startup and shutdown, nor have the commenters provided data to show that the standards (demonstrated through continuous opacity monitoring, proper operation of the ESP AVC, or parametric monitoring) cannot be met during those times, especially given the monitoring flexibility provided in the final rule.

We disagree with the commenter's claim that case law under the CAA and CWA supports their argument that the EPA's approach to startup and shutdown and malfunction periods is inconsistent with CAA section 112. As explained above and in the preamble to the proposed rule, the EPA has taken into account startup and shutdown periods in determining appropriate standards. Further, the case law cited by the commenter does not undermine the EPA's approach to malfunctions. As noted in the preamble to the proposed rule, the relevance of *Portland Cement* and *Essex Chem. Corp.* is questionable in light of subsequent case law and the 1977 amendments to the CAA definition of "emission standard" requiring that such standards be continuous. As the D.C. Circuit noted in *National Lime v. EPA*, 627 F.2d. 416, 434 at n 54, "[w]hether the 1977 Amendments have effectively repealed the regulations permitting flexibility to account for startups, shutdowns and malfunctions regulations applauded by this court in *Portland Cement I*, 486 F.2d at 398-99 is certainly unclear." The EPA's approach to malfunction is consistent with CAA section 112 and is a reasonable interpretation. Further, as noted above, the U.S. Court of Appeals for the D.C. Circuit upheld the EPA's approach to malfunctions in *U.S. Sugar Corp. v. EPA*, 830 F.3d 579, 606-610 (2016).

In any event, the EPA's overall approach to malfunction events in this rule is consistent with the approach set forth in the EPA's 1972 proposed rules cited favorably in *Portland Cement* and *Essex Chemical* in that both the EPA's approach today and in 1972 impart a construction of "reasonableness" to the standards as a whole and adopts a more flexible system of regulation than can be had by a system devoid of "give." *Portland Cement* at 399. *Portland Cement* and *Essex* criticized the EPA regulations that contained no specific provisions to address malfunctions and the EPA's assertion that malfunctions would be dealt with by the informal exercise of discretion in the Agency's enforcement activities. Those decisions did not require exemptions or less stringent standards for malfunction events as the commenter suggests.

The *NRDC v. EPA* (859 F.2d 156, 207(D.C. Cir. 1988)) case cited by the commenter interprets provisions of the CWA that are different in nature than provisions governing standards under section 112 of the CAA. Furthermore, the discussion of technology-based standards in the *NRDC* case is dicta. Nevertheless, the EPA's approach to malfunctions is also consistent with *NRDC*.

## 4.2 Periods of Startup and Shutdown

**4.2-01 Comment:** Commenter 0165 asked how the revisions will impact the rules for periods of startup and shutdown. Commenter 0170 argued that the EPA must fully justify applying the same emission limitations during startup and shutdown as during normal operations. The commenter noted that, in the preamble to the proposed rule, the EPA claims that, in reviewing the proposed standards, it has taken into account how startup and shutdown periods affect emissions and is not proposing alternate standards for those periods. 81 FR 97075. The commenter noted that the proposed rule requires continuous opacity monitoring to indicate ongoing compliance with the PM emission limits. See proposed §63.864(d). According to the commenter, in the preamble, the EPA reviewed numerous continuous opacity monitoring datasets that included periods of startup and shutdown and concluded that the affected units will be able to comply with the proposed standards at all times. 81 FR 97075. The commenter noted that the proposed standard also requires RTO operating temperature and ESP and wet scrubber parameter monitoring; the parameter limits apply at all times, including during startup and shutdown.<sup>127</sup> See proposed §63.864(e). The commenter argued that the EPA has provided no evidence that operating practices have changed since promulgation of subpart MM to support the proposed changes. See, e.g. 81 FR 97075-76. While the commenter indicated they are not in a position to comment on the technical justification, or lack thereof, for the EPA's proposed standard, the commenter definitely supported the use of work practice standards, where appropriate, as alternatives to numerical emission limitations or work practice standards that the EPA has established based on normal operations.

Commenter 0170 asserted that the EPA is required to conduct a thorough analysis and determine whether it is representative of the performance of best-performing sources (the "MACT floor") to require facilities in these source categories to achieve the same emission limitation during startup and shutdown as during normal operations. The commenter argued that the EPA cannot conclude that special provisions for emissions during startup and shutdown are not needed based on "mere speculation," see *NRDC v. EPA*, 859 F.2d 156, 210 (D.C. Cir. 1988). The commenter questioned whether the EPA has conducted a sufficient analysis to demonstrate the achievability of the MACT emission limits established for normal operations during startup and shutdown events, due to a likelihood of limitations in the available data. The commenter contended that default assumption must be that such special provisions *are* needed, rather than an assumption that emissions during startup and shutdown meet all requirements for emissions

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<sup>127</sup> Commenter 0170 agreed with the EPA's conclusion from its residual risk and technology reviews that no changes to the emissions standards are justified or required. However, based on this same review, the commenter argued that the EPA should not make the changes that it has proposed for the opacity operating parameter limit and monitoring exceedance levels.

during normal operation, especially when that was the determination that the EPA made when it originally promulgated the MACT standards.

Commenter 0170 argued that there are several reasons why adequate data often do not exist to allow the EPA to conclude that an emission limitation established for normal operations also represents the performance of the best demonstrated control technology during startups and shutdowns. To the extent emissions data come from required performance tests, the commenter noted that applicable regulations generally prohibit testing during SSM conditions, and further require that data not be used for compliance purposes if obtained during a SSM event.<sup>128</sup> To the extent the EPA evaluates emissions data collected through continuous monitoring, the commenter noted that applicable regulations often require or allow the source to exclude from its reporting of continuous monitoring data those data reflecting SSM conditions. The commenter also pointed out that atypical pollutant concentrations and other stack conditions that may exist during startup and shutdown can result in the CMS producing unusable data, because the pollutant concentration may be outside of the monitoring equipment's span or the stack conditions may not meet monitoring system quality assurance/quality control (QA/QC) parameters, or the data may be truncated on the high end because of limitations of the monitoring equipment.<sup>129</sup>

Commenter 0170 stated that the occurrence of any of these factors would cause the EPA to understate emissions occurring during startup and shutdown. According to the commenter, an additional problem is that it can be unclear whether a condition that leads to excess emissions should be characterized as a startup or shutdown event, or a malfunction event. Without a clear demarcation (both in EPA regulations and in practice), the commenter stated that the EPA may be analyzing data sets that exclude events that the source treated as malfunctions but the Agency would instead say should be included in calculating average performance as startup or shutdown conditions.

Commenter 0170 also noted that the EPA has not addressed (and presumably not evaluated) how PM CEMS would comply with the standards without an exemption or alternative limitation for SSM periods. The commenter noted that PM CEMS provide a direct measurement of PM emissions on a continuous basis. Whereas the EPA has recognized that certain operating parameters, such as wet scrubber pressure drop and ESP secondary power, should not be held to established operating limits during startup and shutdown periods, the commenter contended that no such accommodation has been provided for PM CEMS. Based on the EPA's stated position, the commenter stated that the numerical emission limits for PM would apply at all times, including startup and shutdown. According to the commenter, standards based on a single emission limit, against which compliance will be measured at all times by PM CEMS, do not reflect the language or intent of CAA section 112, when the EPA has acknowledged that SSM

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<sup>128</sup> See, for example, the NESHAP General Provisions, which state that performance tests can only be conducted under representative conditions and which specify that: "Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test...." 40 CFR 63.7(e)(1); see also 40 CFR 60.8(c) (same for performance testing for NSPS).

<sup>129</sup> Note that data from periods when a monitoring system is outside of control limits are required to be excluded from emission averages under the NESHAP General Provisions. See 40 CFR 63.8(c)(7)(ii).

events may make that limitation unachievable (or, at a minimum, has not shown the limitation would be achievable when compliance is measured by PM CEMS).

**Response:** We disagree with the commenter that the EPA did not adequately analyze the ability of affected sources to meet subpart MM MACT emissions limits during startup and shutdown. The EPA has used an extensive amount of information collected from pulp and paper ICR responses (not “mere speculation”) to justify applying the same emission limits during startup and shutdown as during normal operations. While we agree with the commenter’s suggestion that the EPA can set alternative standards during startup and shutdown, we evaluated whether different standards during startup and shutdown periods are justified and determined that different standards are not warranted for subpart MM given the flexibility included in the final rule. The final rule contains the following flexible provisions that make it feasible for the same standards to apply at all times:

- Opacity monitoring allowances specifying a limited number of exceedances that will not be considered as violations, developed through review of COMS data sets that included SSM periods and based on levels all affected units for which the EPA has data have achieved.
- A requirement to maintain proper operation of the ESP AVC instead of requiring 3-hour average ESP parameter monitoring (as proposed).
- Provisions to clarify that corrective actions and violations of opacity and parameter monitoring limits are only triggered during times when spent liquor solids or lime mud are fed (as applicable).
- A provision to clarify that corrective action can include completion of transient startup and shutdown conditions as expediently as possible.
- For wet scrubber parameter monitors, language that allows facilities to use scrubber liquid flow rate instead of both liquid flow and pressure drop to demonstrate compliance during periods of startup and shutdown because wet scrubber pressure drop is difficult to achieve during these periods.
- As originally promulgated, violations of scrubber or alternative parameter monitoring limits are not incurred until six or more 3-hour averages do not meet the operating limit. Corrective actions are required after the first instance, and can include completion of transient startup and shutdown conditions as expeditiously as possible.
- As originally promulgated, a provision which states that no more than one non-opacity monitoring exceedance (*e.g.*, for wet scrubbers, RTOs, or alternative parameters) will be attributed to a given 24-hour period.

With the above monitoring provisions that address periods of startup and shutdown, the EPA concluded that alternative standards (*e.g.*, work practices) during startup and shutdown are unnecessary. Our view of the commenter’s suggestion that the EPA should have developed a separate emission limit or work practice standard for startup and shutdown periods is that separate standards would have added an unnecessary layer of complexity to the rule, not flexibility, as provided in the final rule.

The commenter questioned our rigor and whether we “conducted a sufficient analysis to demonstrate the achievability” of the proposal. We did, as shown by two technical memoranda that

were provided at proposal to document our analysis of monitoring systems during startup and shutdown for pulp and paper processes subject to subpart MM:

- *Review of the Continuous Opacity Monitoring System Data from the Pulp and Paper ICR Responses for Subpart MM Sources* (June 14, 2016) (Docket Item No. EPA-HQ-OAR-2014-0741-0158)
- *Review of Pulp and Paper Information Collection Request Responses Pertaining to Startup and Shutdown of Subpart MM Equipment* (March 29, 2016) (Docket Item No. EPA-HQ-OAR-2014-0741-0142)

The first memorandum was updated following proposal with an addendum to provide additional documentation of the COMS startup and shutdown data. The revised memorandum, *Addendum to the Review of the Continuous Opacity Monitoring System Data from the Pulp and Paper ICR Responses for Subpart MM Sources*, is available in the docket for the final rule.

Although commenters suggest there is no basis for revising the standards so they will apply at all times absent new and improved technologies, we note that changes in control technologies are not a prerequisite for EPA to update monitoring procedures for demonstrating continuous compliance to square them with recent legal precedent or to reflect what review of monitoring data shows is achievable with current technology. The EPA disagrees with the suggestion that there is a “default assumption” that “special provisions during startup and shutdown are needed.” None of the commenters submitted specific information to indicate that different standards are justified or to explain specifically why subpart MM MACT standards are overly stringent during startup or shutdown. This failure to provide specific information to support claims of unachievability is especially notable because the subpart MM MACT standards have already applied at all times, including periods of startup and shutdown, since the SSM exemptions incorporated into subpart MM were vacated in the *Sierra Club* decision. The commenters also did not identify or justify any specific different standards (or work practices) that should apply during startup and shutdown.

The commenter appears to believe that sufficient information is unavailable on operations during SSM because compliance testing is precluded during those periods and sources previously had the option of excluding COMS data collected during SSM from reports to regulatory authorities. However, contrary to this assertion, we collected extensive COMS data covering SSM periods. Actual monitoring data (not summary reports) were collected and analyzed prior to proposal. Our ICR specified that SSM periods be included in the data provided to EPA, so numerous data sets including these periods were available to the EPA and analyzed for the proposal. Opacity emissions occurring during periods of SSM were retained in the continuous monitoring data averages analyzed in order to evaluate whether the updated NESHAP should distinguish between periods of startup and shutdown and normal operation. The memoranda in the docket noted above document the extensive amount of COMS data that was received. The commenter suggests that the EPA needs to analyze monitoring data for an extended period of time and for numerous facilities. The COMS data sets that the EPA analyzed included an entire year of data for most of the pulp mill recovery furnaces and ESP-controlled lime kilns in the U.S. This data set was sufficient to represent the existing sources and to support our conclusion that, with the opacity monitoring allowances provided, there is no need for a separate standard for startup and shutdown periods.



For emission units where compliance is based on stack testing and continuous parameter monitoring (as opposed to continuous emissions monitoring), the EPA collected ICR responses to equipment-specific questions seeking information on parameter limits that may be difficult to meet during periods of startup and shutdown. These responses were analyzed and used to design the continuous parameter monitoring provisions listed above to address periods of startup and shutdown.

When stack tests are the sole means of directly measuring emissions (*i.e.*, when continuous emissions monitors are not used), we recognize the commenter's point that emissions data are not available for SSM periods because performance testing is not conducted during periods of SSM. Subpart MM does not require stack testing during periods of SSM, and, in fact, through incorporation of the 40 CFR 63.7(e)(1) language as superseded by §63.865, prevents stack testing during SSM.

The commenter suggested that "atypical pollutant concentrations and other stack conditions that may exist during startup and shutdown can result in the CMS producing unusable data" in terms of monitor span or QA/QC requirements. We have addressed this by specifying that corrective actions and violations of opacity and parameter monitoring limits are triggered during times when spent liquor solids or lime mud is fed. Liquor solids and lime mud typically are not introduced into the recovery furnace, sulfite or semichemical combustion unit, or lime kiln (as applicable) unless startup/shutdown conditions are stabilized. In addition, the final rule specifies that corrective actions can include completion of transient startup and shutdown conditions as expeditiously as possible.

We also disagree with the comment that there is no demarcation between malfunctions and startup and shutdown events. As explained at proposal (81 FR 97076-77), malfunction events are reasonably treated differently than periods of startup and shutdown, which are predictable and routine aspects of a source's operations. As also explained, the EPA has determined that CAA section 112 does not require that emissions that occur during malfunctions be factored into development of CAA section 112 standards. Regarding the commenters' concern that it may be unclear whether a condition that leads to excess emissions should be characterized as a startup/shutdown event or a malfunction event, we note that the 40 CFR part 63 General Provisions provides generic definitions of "startup," "shutdown," and "malfunction" to help facilities determine how to label their emissions data. The EPA has not included rigorous, equipment-specific definitions of these terms in subpart MM, because defining these terms on an equipment-specific basis adds complexity to the rule and inevitably would create issues where a "one-size-fits-all" definition is not a good fit for the entire population of subpart MM process units. Most mills are likely to have site-specific criteria that they use in distinguishing startup/shutdown within the framework of the General Provisions definitions. Regarding labeling of the data sets that the EPA analyzed, the EPA's analysis treated periods labeled as "startup/shutdown" as startup/shutdown and periods labeled as "malfunctions" as malfunctions, and the EPA has no reason to conclude that data were mislabeled. Even if data were mislabeled (or not labeled at all), it would have little effect on the outcome of our analysis because all SSM periods were retained in the COMS data sets analyzed whether labeled or not.

Regarding the comment about PM CEMS, they are not required in subpart MM. As discussed in response to comment 3.2.2.4-02, PM CEMS are available for facilities that petition the Administrator to request use of an alternative monitoring approach. Should a facility petition the Administrator to use PM CEMS, that petition would include a suggested data recording and averaging approach that could be designed with compliance during startup and shutdown in mind.

In summary, in the final rule we are setting standards that apply at all times, including during startup and shutdown periods, in response to the *Sierra Club* decision. We have explained in the proposed rule documentation and again in this document our rationale for not setting a separate standard for startup/shutdown events for this source category. The commenter has not provided information to support development of alternative standards that would apply during startup/shutdown events or offered any evidence, information or other specific argument regarding why these facilities cannot meet the standard that applies during normal operations during its startup/shutdown events given the monitoring allowances and other flexible provisions included in the final rule. Therefore, the EPA is promulgating the same standards that apply during normal operation for periods of startup and shutdown.

### 4.3 Periods of Malfunction

**4.3-01 Comment:** Commenter 0165 asked how the revisions will impact the rules for periods of malfunction. Commenter 0170 argued that the EPA is required to take malfunctions into account when adopting emissions standards. Commenter 0170 noted the EPA’s assertion that its “approach to malfunctions” in setting emissions standards “*is consistent with CAA section 112 and is a reasonable interpretation of the statute.*” 81 FR 97076. The commenter contended that the EPA offered very little support for that claim, however, other than stating its own, often counterintuitive, conclusions. For example, the commenter noted that the EPA said it “*interprets CAA section 112 as not requiring emissions that occur during periods of malfunction be factored into development of CAA section 112 standards.*” *Id.* The commenter noted that the EPA made little effort to justify that assertion. *See Nat’l Ass’n of Clean Water Agencies v. EPA*, 734 F.3d at 1143 (remanding because “one sentence in the **Federal Register** is not enough of a basis to uphold EPA’s new approach”). According to the commenter, the Agency’s statement that “[t]here 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 emission standards,” *id.*, has it backwards. The commenter argued that there is nothing in CAA section 112 that requires the EPA to ignore malfunctions and set MACT standards based on a level of emissions that even best-performing sources only achieve part of the time.

Commenter 0170 stated that three times in one paragraph in the preamble to the proposed rule, the EPA subtly recognized this, stating: “There is nothing in CAA section 112 that directs the Agency to consider malfunctions” and “[N]othing in the CAA section 112 requires the Agency to consider malfunctions” and “[N]o statutory language **compels** the EPA to consider [malfunctions],” (81 FR 97076) (emphasis added). The commenter noted that the EPA’s position was affirmed in *U.S. Sugar Corp. v. EPA*, 830 F.3d 579, 608 (D.C. Cir. 2016) where the Court found, applying *Chevron* deference to the Agency’s interpretation of its obligations under the CAA, that the EPA had discretion to adopt this approach, not that it was required to adopt it, or even that it was wise for the EPA to do so.<sup>130</sup> “For our purposes, we need not (indeed, must not),

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<sup>130</sup> Although the *U.S. Sugar* panel accepted the EPA’s assertion in briefing that the “best controlled similar source” “is unlikely to be a malfunctioning source,” 830 F.3d at 608, that statement: (a) applies to the MACT floor requirement for new sources, not to the existing sources subject to the proposed rule, for which the MACT floor is based on the more-inclusive “average emission limitation achieved by the best performing 12 percent of the existing sources” (CAA section 112(d)(3)(A)); and (b) in any case, is contrary to repeated EPA statements recognizing that even the best-performing sources can be expected to suffer from some exceedances of standards based on normal operations, due to unavoidable malfunctions.

evaluate the policy implications of the EPA's regulatory choice because our review is confined to determining whether the EPA's regulation reflects a permissible reading of the applicable statute under Chevron." *Id.* In contrast, the commenter's position is that the CAA and the case law *permits* the EPA to address SSM incidents through alternative emissions standards, whether numerical limits or work practice measures, and that doing so is consistent with the structure and principles of the CAA. In addition, the commenter believes that for the EPA to *choose*, without sufficient explanation, to abandon an approach that it has used for decades and in multiple programs where it accounted for emissions from SSM events, is itself arbitrary and capricious.

Commenter 0168 agreed with commenter 0170, arguing that the U.S. Court of Appeals decision last year in *U.S. Sugar Corp. v. EPA*, 830 F.3d 579 (D.C. Cir. 2016) does not require the EPA to abandon its previous technical determinations about what standards are achievable and represent the best performers, in favor of the EPA's latest policy preference of ignoring emissions that can be anticipated to occur during malfunctions. According to the commenter, that decision merely held that the EPA's interpretation of section 112(d) as allowing it to base section 112(d) standards on emission control performance without regard to malfunctions is a permissible one, not that it is required. *See* 830 F.3d 606-608. The commenter argued that the EPA is free in the current rulemaking to stick with its previous technical determinations and policy preferences, and provide that the numeric emission limitations contained in the subpart MM rule, which were based on steady-state operation, do not apply during SSM events. The commenter indicated that emissions during that time could be controlled by "design, equipment, work practice, or operational standard[s]" under CAA sections 112(h) and 302(k). The commenter stated that, in fact, the EPA arguably has already proposed such alternative standards.

Commenter 0170 noted that the EPA also offered a backwards, results-driven rationale for ignoring malfunctions, which directly contravenes congressional intent that MACT floor standards be based on what the best sources actually achieve: "accounting for malfunctions could lead to standards that are not reflective of (and significantly less stringent than) levels that are achieved by a well-performing non-malfunctioning source." 81 FR 97076. According to the commenter, the EPA cannot ignore the requirement that MACT floor standards reflect performance actually achieved, just because the Agency would like the standards to be more stringent than what actual performance reflects. In addition, the commenter noted that the EPA appears to be suggesting that accounting for malfunctions in setting MACT standards will necessarily result in emissions standards that apply to normal operations which are less stringent. Throughout their comments, however, the commenter explained that statutory language, congressional intent, and case law support the EPA promulgating alternative emissions standards, whether numerical limits or work practices, that would apply only to malfunction events. According to the commenter, doing so would not have to affect the stringency of the emissions standards that apply during normal, steady-state operations at all.

Commenter 0170 noted the EPA's acknowledgement that even properly designed and operated equipment will sometimes exceed emission limitations that were based on steady-state operation, due to malfunctions. The commenter pointed out that even the best performing units in the source categories covered by the proposed rule (like any technologies) are subject to a wide variety of potential malfunctions (*e.g.*, power failures, equipment breakdowns). *See, e.g.*, 81 FR 97076. The commenter pointed out that operators of these processes and equipment must treat malfunctions as very distinct events from steady-state operations, requiring, depending on the

severity of the malfunction, anything from slight adjustment of operating or control equipment parameters all the way to emergency fire response actions. The commenter agreed with the EPA's conclusion that the factual complexity of differing processes and of the severity, frequency, and duration of malfunctions makes [numerical] standard-setting difficult. See *id.* In addition, the commenter pointed out that it is often infeasible to gather emissions data during malfunctions – either for standard-setting or for compliance-demonstration purposes. The commenter noted that malfunctions are by definition unexpected, so it is not possible to plan to have stack test or monitoring equipment in place to measure emissions when one occurs. Even if test or monitoring equipment is in place, the commenter noted that emissions during malfunctions often are not routed to a stack where they can be measured, and upsets during stack testing invalidate the test results under the EPA's approved test methods.<sup>131</sup>

Notwithstanding the difficulties of collecting information and emissions data during malfunctions, in the case of pulp mills, commenter 0170 stated that the EPA could easily have relied on the information about malfunction events it has received for more than 30 years pursuant to the Kraft Pulp Mill NSPS rules applying to new and modified sources, as well as over a dozen years of reporting under the subpart MM rules. Thus, the commenter concluded, the EPA's protestations that it is without a factual basis to make conclusions about what occurs during a malfunction event for these sources, ring hollow. The commenter contended that the EPA could easily have used these data to set reasonable work practice standards for SSM events. The commenter argued that there is no justification for the EPA's refusal to establish work practice standards for SSM events when it has used this same approach for decades under the NSPS program, and later in the MACT program. The commenter argued that the EPA failed to demonstrate why this approach is suddenly inadequate, when it has successfully used this approach since the dawn of its regulatory programs.

Rather than supporting the EPA's decision to ignore the fact that SSM events can lead to higher emissions even at well-operated facilities with the best control equipment, commenter 0170 stated that these findings should lead the EPA to its authority under CAA section 112(h) to prescribe alternative design, equipment, work practice or operational standards where it is not feasible to set or enforce a numerical emission limit. The commenter argued that the EPA cannot rationally defend its articulated view that applying the concept of "best performing" is inconsistent with a source experiencing a malfunction. See 81 FR 97076. Besides being contrary to the fact that best performers do indeed experience malfunctions, the commenter asserted that this statement ignores that there are work practices – such as monitoring of operating parameters to identify a malfunction and stopping or cutting back the process accordingly – that represent the best practices for minimizing emissions during a malfunction. While the measures that represent these best practices will depend on facility-specific issues, such as process design, pollution control train, and other factors, the commenter pointed out that they nonetheless represent "the maximum degree of reduction in emissions of the hazardous air pollutants ... achievable ... through application of measures, processes, methods, systems or techniques" and

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<sup>131</sup> The EPA acknowledged these potential obstacles to measuring emissions during SSM events in the preamble to final emissions standards for medical waste incinerators, 74 FR 51368, 51394 (Oct. 6, 2009): ("It would be very difficult to do any meaningful testing during such an event because the exhaust flow rates, temperatures, and other stack conditions would be highly variable and could foul up the isokinetic emissions test methods (thus invalidating the testing)."). See also proposed §63.865 (which would prohibit performance testing during malfunctions).

reflect "the emission control that is achieved in practice by the best controlled similar source[s]." CAA section 112(d)(2) and (3).

Commenter 0170 noted that the EPA claimed that attributing malfunctions to a "best performing" source somehow presents significant difficulties. See 81 FR 97076. To the contrary, the commenter argued, it presents significant difficulties when the EPA ignores the undisputed existence of malfunctions even at best-performing sources, and claims falsely that the best-performing sources "achieve" emission levels that they undisputedly do not achieve part of the time. According to the commenter, the EPA itself describes malfunctions as being sometimes unavoidable or "not reasonably preventable," despite proper design and maintenance of equipment. See 40 CFR 63.2 and 81 FR 97076, 97077. Consequently, the commenter argued there is no basis for the EPA's conclusion that malfunction events are not representative of best-performing sources.<sup>132</sup> The commenter noted the EPA's acknowledgement that even best performing sources have malfunctions, attempting to reassure source operators that "[a]dministrative and judicial procedures for addressing exceedances of the standards fully recognize that violations may occur despite good faith efforts to comply and can accommodate those situations." 81 FR 97077. But, rather than absolving the EPA of its rulemaking responsibility under section 112, the commenter stated that this just is further indication that the EPA must, in this rulemaking, acknowledge the fact that those sources nevertheless experience malfunction events, rather than assuming away the emissions associated with those events.

Commenter 0170 asserted that, by proposing MACT standards that the EPA recognized even the best-performing existing sources cannot achieve part of the time, the EPA is going beyond the MACT floor, yet without making the demonstrations that the statute and case law require the Agency to make in order to impose beyond-the-floor MACT standards (including the Agency's obligation to consider costs). The commenter stated that this is especially obvious when one considers the multitude of considerations by which the EPA will determine an appropriate response when a source experiences exceedances due to a malfunction. Though the affirmative defense in NESHAPs for Portland Cement plants was struck down in *NRDC v. EPA*, 749 F.3d 1055 (D.C. Cir. 2014), the commenter indicated the same considerations still remain in the preamble: The EPA's response will be based on, for example, whether the facility had conducted "root cause analyses to ascertain and rectify excess emissions." 81 FR 97077. According to the commenter, the EPA made no attempt to justify those conditions as reasonable "taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements," as required by CAA section 112(d)(2).

Commenter 0170 argued that it is indefensible for the EPA to acknowledge that malfunctions are inevitable, even for the best-performing sources, and yet refuse to include emissions data representing malfunctions (if such data exist) in calculating the MACT floor (see

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<sup>132</sup> See *id.*; see also, *e.g.*, *Cement Kiln Recycling Coalition*, 255 F.3d at 862-865 (recognizing that there is variability in the performance of control technologies, which needs to be taken into account in establishing emission limitations based on the MACT floor); *Sierra Club v. EPA*, 167 F.3d 658, 665 (D.C. Cir. 1999). Note that, although the *U.S. Sugar* decision commented that it might be impossible to develop alternative standards addressing malfunctions, 830 F.3d at 607-608, that was not a holding of the case, nor was it based on anything other than repeating the EPA's conclusory assertions to that effect.

81 FR 97076) or to consider appropriate alternative work practice standards, instead requiring that those MACT floor limitations be met even during malfunctions. If it is possible to gather sufficient representative data reflecting emissions during malfunctions, the commenter argued that the EPA is obligated to consider those data in its MACT floor calculations for steady-state operating conditions. To the extent the EPA had access to continuous monitoring data for emission units covered by the NESHAP, the commenter contended that the EPA could have conducted analyses of emissions levels during malfunction events.<sup>133</sup> The commenter also noted that many types of sources are required by many state agencies to submit deviation reports or malfunction reports when they experience a malfunction that causes an exceedance of an applicable limitation, and recordkeeping for malfunctions has been required for sources subject to the Kraft Pulp Mill NSPS for decades. See 40 CFR 60.7(a)(7). The commenter contended that the EPA does not appear to have made any attempt to obtain and analyze such reports in order to assess what type of requirement might reasonably apply to the subject emission units during malfunctions.

Commenter 0170 stated that there are several options the EPA could use for setting emissions standards under CAA section 112 that would apply during malfunction events.

- The EPA might be able to establish a numerical emission limitation that applies at all times, but that has an averaging time of sufficient duration that short, infrequent spikes in emissions due to malfunctions would not cause the source to exceed the emission limitation (while at the same time ensuring that the source does not operate in a way that causes frequent, lengthy excursions above the normal controlled emission rate).
- The EPA could use the flexibility accorded by CAA section 302(k) (defining “emission limitation” and “emission standard” to include “any requirement relating to the operation or maintenance of a source to ensure continuous emission reduction, and any design, equipment, work practice or operational standard promulgated under” the CAA) to address emissions during malfunction events through operational requirements, rather than by applying the same limits on pollutant concentrations in exhaust gases that apply during normal operations.
- The EPA could conclude, as explained above, that it has grounds to exercise its authority under CAA section 112(h) to promulgate a design, equipment, work practice, or operational standard, or combination thereof, because it is not feasible to prescribe or enforce an emissions standard.
- The EPA might use several of these approaches in combination.

The commenter stated that accommodating malfunctions need not result in either an exemption, or an increased numerical emission limitation. The commenter looked for the EPA use its authority under CAA sections 112 and 302(k) to address malfunctions in a section 112-compliant manner.

Commenter 0170 concluded that there is no indication in the proposed rule that the EPA gave much, if any, consideration to any of these available options for addressing emissions

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<sup>133</sup> Even if the continuous monitoring data are for parameters not regulated by the proposed standards, analysis of monitoring data for those other parameters during malfunction events might form a reasonable basis for the EPA’s assessment of what standards are achieved or achievable during malfunctions.

during malfunctions. In short, the commenter stated there are ample reasons to reject the EPA's conclusory assertions that it cannot take malfunctions into account when setting MACT standards for the subject source categories. According to the commenter, the EPA's failure to evaluate these options thoroughly renders the proposed rule arbitrary and requires the EPA to develop a new proposal.

**Response:** The commenter asserts that the EPA must account for malfunctions when determining the emissions level achieved by the best performing sources, but this view is neither reasonable nor supported by the text of the CAA. A 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 interprets CAA section 112 as not requiring emissions that occur during periods of malfunction to 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 emission limitation “achieved” by the best performing 12 percent of existing sources. There is nothing in section 112 that directs the Agency to consider malfunctions in determining the level “achieved” by the best performing sources when setting emissions standards. As the D.C. Circuit has recognized, the phrase “average emissions limitation achieved by the best performing 12 percent of” sources “says nothing about how the performance of the best units is to be calculated.” *Nat'l Ass'n of Clean Water Agencies v. EPA*, 734 F.3d 1115, 1141 (D.C. Cir. 2013). In addition, accounting for malfunctions in setting emissions standards would be difficult, if not impossible, and could lead to standards that are not reflective of levels achieved by a well-performing non-malfunctioning source. The EPA's approach to malfunctions is a reasonable interpretation of the statute. If a source fails to comply with the applicable CAA section 112 standards as a result of a malfunction event, as discussed above, the EPA would determine an appropriate response, and the source can raise any and all defenses in any enforcement action that may be filed.

The EPA's approach both accounts for variability associated with a reasonably foreseeable range of operating conditions and recognizes that enforcement mechanisms can address emission exceedances due to unpreventable equipment or process failures. While commenters may seek greater accommodation for malfunctions, such accommodation is not compelled by the CAA.

Unlike startup and shutdown, which are foreseeable operations, no one can predict the nature, scope, severity, timing, length, number or likely recurrences of malfunctions a source may – or may not – experience. Although the EPA bases emissions standards on different manners of operations and circumstances, the EPA only takes into account conditions that are “foreseeable” and “which can reasonably be expected to recur.” *Sierra Club v. EPA*, 167 F.3d 658, 665 (D.C. Cir. 1999); see also *Nat'l Lime Ass'n v. EPA*, 627 F.2d. 416, 431 n.46 (1980). Virtually no malfunction is foreseeable in terms of its nature, timing or effect on emission levels and no operator knows if or when a malfunction could recur.

The commenter identifies no language in the statute that even implies that the EPA must factor into MACT emissions standards the emission levels that occur during malfunctions. Yet the commenter asserts that CAA section 112 mandates that the EPA account for malfunctions in

establishing every MACT standard or set a separate MACT standard for malfunctions, so that they reflect higher emission levels that might occur during undefined, unidentified malfunction events. The commenter appears to rely on the silence of section 112, which does not speak directly to how malfunctions are to be treated to support their view, filling the void with the commenters' own judgments of how the EPA must address such uncertain and undefined events.

Although the EPA may have authority to address malfunctions through different mechanisms – albeit limited by the Court in *Sierra Club v. EPA* (striking down exemptions for malfunctions) and *NRDC v. EPA* (striking down an affirmative defense for malfunctions) – the EPA is not required by section 112 to account for malfunction emissions by resetting MACT standards (*e.g.*, with long averaging times) or by setting separate MACT standards (*e.g.*, work practice standards) as suggested by the commenter. The U.S. Court of Appeals for the D.C. Circuit upheld the EPA's approach to malfunctions in *U.S. Sugar Corp. v. EPA*, 830 F.3d 579, 606-610 (2016).

The commenter contends that section 112 mandates that the EPA establish MACT standards so that they reflect higher emission levels that might occur during unidentified, unmeasured malfunction events. To support their argument, the commenter states that emission limitations must be “achieved” by the best performers. The commenter asserts that the EPA has failed to develop standards that are achieved if the best performing sources are expected to have malfunctions, and those malfunctions result in emissions that exceed the standard. But a source that suffers worker malfeasance or experiences a hurricane or a terrorist event may also exceed emissions standards at certain times. These events, like malfunctions, do not transform achievable standards into unachievable standards. Indeed, under the commenter's reasoning, every MACT standard is potentially invalid because it does not reflect emission levels that may occur during the next malfunction, act of God, strike, malfeasance or other unpredictable event.

Hurricanes and malfeasance can occur at well-maintained and well-managed sources and can cause upset conditions that result in violations of emissions standards, but this does not warrant factoring such unpredictable events into revised emissions standards. Even if malfunctions were inevitable for all sources, including the best-performing sources, that does not make it possible to take them into account when establishing MACT emissions standards, because they are still unknown in frequency, length, magnitude and, most importantly, effect on emission levels.

As the D.C. Circuit also noted in *Sierra Club v. EPA*, 167 F.3d 658 (D.C. Cir. 1999), the phrase “average emissions limitation achieved by the best performing 12 percent of units” in section 112 of the CAA “says nothing about how the performance of the best units is to be calculated.” *Id.* at 661. Congress has not directly addressed the issue of whether emissions that occur during periods of malfunction must be taken into account in calculating the performance of the best units, and the EPA's approach to malfunctions is reasonable for the reasons set out in the preamble to the proposed rule. For example, the EPA explained, and commenter agrees, that the factual complexity of differing processes and of the severity, frequency, and duration of malfunctions makes standard-setting impracticable. In fact, the commenter's statement that the best work practices employed during malfunctions “will depend on facility-specific issues, such as process design, pollution control train, and other factors” highlights the impracticability of setting work practice standards that apply across all sources in the category for the myriad of



types of malfunction that could occur. The commenter does not explain how any of the options suggested would make it any easier or practicable for the EPA to set a national standard that accounts for the innumerable types of malfunctions that, as commenter points out, might vary depending on facility-specific issues. The EPA further explained that the performance of units that are malfunctioning is not reasonably foreseeable and cited to case law supporting its approach to malfunctions. *See Sierra Club* at 665 (discussing need to take into account the worst reasonably foreseeable performance) and *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.”).

In pointing out that “accounting for malfunctions could lead to standards that are not reflective of (and significantly less stringent than) levels that are achieved by a well-performing non-malfunctioning source,” the EPA was merely pointing out one possible consequence of taking malfunctions into account in setting standards if such an approach were practicable. This theoretical consequence is not driving the EPA’s approach to malfunctions. Further, the EPA’s is not going beyond the MACT floor as the commenter suggests. Rather, the EPA is setting floor standards based on a reasonable interpretation of a statutory provision that is ambiguous as to how the performance of the best units is to be calculated.

The commenter argues that, if it is possible to gather sufficient representative data reflecting emissions during malfunctions, then the EPA is obligated to consider these data in its MACT floor calculations, but also makes the seemingly inconsistent point that it is often infeasible to gather emission data during malfunctions.

With respect to commenters’ suggestion that the EPA consider work practice standards, section 112(h) of the CAA allows the EPA to set work practice standards instead of an emissions floor “if it is not feasible in the judgment of the Administrator to prescribe or enforce an emission standard.” (“[T]he Administrator may, in lieu [of a numeric standard], promulgate a design, equipment, work practice, or operational standard, or combination thereof.”). In exercising the option to establish a work practice standard, that standard must “**in the Administrator’s judgment** [be] consistent with the provisions of subsection (d) or (f).” CAA section 112(h)(1) (emphasis added). Under CAA section 112(h)(2)(B), it is “not feasible” to set an emissions standard when “the application of measurement methodology to a particular class of sources is not practicable due to technological and economic limitations.” Thus, section 112(h) “allows EPA to substitute work practice standards for emission floors only if measuring emission levels is technologically or economically infeasible.” *Sierra Club v. EPA*, 479 F.3d 875, 884 (D.C. Cir. 2007). These subsections make clear that the EPA is to base emissions standards on the emission levels already achieved by the best performing sources as applicable. This means that work practice standards, although written in non-numeric form, must still satisfy statutory requirements such as those applicable to MACT standards.

It is just as difficult to establish a work practice standard for malfunctions that can approximate the level of emission reduction achieved by the best performing sources during malfunctions as it would be to factor emission levels that occur during malfunctions into the numeric standards, as discussed above. The EPA would have to design a single work practice standard that applies equally to a tank explosion as it does to innumerable types of operator error,

computer glitches or a myriad of other unknown events, or alternatively create innumerable work practice standards.

In summary, the EPA has concluded that, based on this rulemaking record, it would clearly be inappropriate to set a work practice standard for malfunctions in lieu of the otherwise applicable numerical emission limit. For all the reasons explained in the preamble to the final rule and above, the EPA's approach to malfunctions is reasonable and consistent with the statute regardless of whether collection of certain types of malfunction data under certain circumstances is theoretically possible. We also note that we would consider any response to violations caused by a malfunction on a case-by-case basis through the exercise of enforcement discretion.

Additionally, while the EPA is not required to address malfunctions, flexibilities were added as part of this review which may help with addressing malfunctions. For example, the provision in §63.864(k)(3), which recognized that a single upset event or malfunction could trigger several consecutive 3-hour monitoring excursions despite a facility's best efforts to take corrective action after the first excursion, was proposed to be removed. Public comments did not support the proposed removal of §63.864(k)(3), so the EPA has kept the provision in the final rulemaking package.

**4.3-02 Comment:** Commenter 0170 argued that relying on "enforcement discretion" is no substitute for addressing malfunction events in the emissions standards themselves. The commenter noted that, in the proposed rule, the EPA reviewed the original MACT provisions at subpart MM and, while it removed all references to the portion of the General Provisions that previously contained potential exemptions from numerical emissions standards during periods, it proposed nothing to replace those provisions, other than a discussion regarding the EPA's and the judiciary's ability to use enforcement discretion. The commenter noted that they have commented on many previous rulemakings concerning SSM provisions wherein the EPA included an affirmative defense for violations associated with malfunctions specifically because it "recogniz[ed] that there is a tension ...to ensure adequate compliance while simultaneously recognizing that despite the most diligent of efforts, emission standards may be violated under circumstances entirely beyond the control of the source." Petroleum Refinery Sector Risk and Technology Review Proposed Rule, 79 FR 36945. The commenter noted that the EPA has eliminated the affirmative defense from its current rulemakings, and did not include an affirmative defense in the proposed rule, following the U.S. Court of Appeals for the D.C. Circuit decision reviewing NESHAPs for Portland cement plants, *NRDC v. EPA*, 749 F.3d 1055. Although that case only directly affects NESHAPs for Portland cement plants, the commenter noted that the Court found that the EPA lacked authority to impose limitations (by way of the affirmative defense language in the Portland cement NESHAPs) on the district courts' ability under the CAA to determine appropriate penalties for a violation. 749 F.3d at 1063-64. The commenter contended that the decision said nothing about the validity, under the statute, of the EPA declaring unavoidable emissions associated with SSM events to be violations in the first place.

Commenter 0170 noted that the Agency stated at the time that an affirmative defense provision was necessary to effectuate the congressional directive that MACT standards be based on what is achievable with available technology; otherwise, the EPA would have had no statutory authority to promulgate the affirmative defense. Yet the commenter noted that, in the

proposed rule, the EPA not only did not include an affirmative defense, it did not even explain why it is reasonable to treat exceedances associated with malfunctions as violations in the absence of the defense that it saw fit to include in earlier rulemakings.<sup>134</sup> As discussed above, the commenter contended that the EPA could include many of the concepts that it incorporated into the affirmative defense provisions of other recent NESHAP proposals into alternative, work practice standards that would apply during malfunctions. The commenter asserted that would be entirely consistent with the holding of *NRDC v. EPA*.

According to commenter 0170, the EPA's statements in the preamble to the proposed rule that, "in the event that a source fails to comply with the applicable CAA section 112 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," 81 FR 97076 (emphasis added), are woefully inadequate. The commenter asked: When, and why, if the source is unable to comply with emissions standards because of a malfunction—which the EPA defines as an event the source could not have avoided through better design or operation and maintenance—would it ever be appropriate for the EPA not to use its enforcement discretion? Moreover, the commenter noted that the EPA provided no analysis that would supersede its long-standing determination that it is not appropriate to rely on enforcement, rather than regulatory language, to address the inability to comply with technology-based standards during SSM events. See 37 FR 17214 (Aug. 25, 1972) (establishing SSM provision in NSPS). The commenter noted that courts have adopted the same view. See, e.g., *Portland Cement*, 486 F.2d at 398 n.1; *National Lime*, 627 F.2d at 431 n.46 ("the flexibility appropriate to enforcement will not render 'achievable' a standard which cannot be achieved on a regular basis, either for the reasons expressly taken into account in compliance determination regulations (here startup, shutdown and malfunction), or otherwise.").<sup>135</sup>

Commenter 0170 contended that, among other things, the EPA's exercise of its discretion not to bring an enforcement action for excusable malfunctions does nothing to prevent a source from having to defend itself from a citizen suit or state enforcement action for the same malfunctions. Moreover, the commenter noted that the EPA did not even take the most basic step here of declaring that it will exercise its enforcement discretion for events that meet the criteria it has applied in the past to the affirmative defense; instead, the EPA merely states that it "would determine an appropriate response" based on those criteria. The commenter asserted that this does nothing to make standards that ignore the effect on compliance of SSM events acceptable

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<sup>134</sup> In comments on previous proposed NESHAPs, where the EPA did include an affirmative defense to civil penalties for malfunctions, commenter 0170 described ways in which that affirmative defense was unnecessarily narrow and imposed inappropriate criteria for a source to qualify for the affirmative defense. Nevertheless, the affirmative defense that the EPA previously thought should be included in MACT standards did provide some mitigation of the Agency's general approach of treating excess emissions associated with malfunctions as violations.

<sup>135</sup> See also *Marathon Oil Co. v. EPA*, 564 F.2d at 1273 (explaining why the EPA's statement that it would not take enforcement action against sources that exceeded effluent limitations because of upset events was "not an adequate response" to the argument that standards that cannot be met during unavoidable upsets fail to reflect available technology). Also for these reasons, the EPA's statements in the proposed rule preamble that the EPA will "determine an appropriate response" to reported exceedances of the proposed standards, 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" (81 FR 97076), are not in any way a substitute for the EPA setting the standards at an achievable level in the first place.

under CAA section 112 and relevant case law, nor does it further the purposes of section 112, because after-the-fact determinations of whether or not to penalize a source that has a malfunction do not require or encourage measures that may reduce the magnitude or duration of exceedances associated with malfunctions. According to the commenter, rather than simply eliminating the affirmative defense language that was rejected by the D.C. Circuit for the Portland Cement MACT standards, the EPA should address the issues raised by the inherent conflict it sees between continually applicable emissions standards and the capability of the identified technology, through promulgating some sort of achievable alternative standard for SSM events.

Commenter 0170 also noted that the EPA stated that, as with the district court in an enforcement action (or in a citizen enforcement action), “similarly, the presiding officer in an administrative proceeding can consider any defense raised and determine whether Administrative penalties are appropriate.” 81 FR 97076-77. The commenter noted that the *NRDC v. EPA* Court specifically recognized that the EPA has authority to *limit* the situations in which it will impose administrative penalties in that manner, not just make it a matter of the presiding officer’s choice. *See* 749 F.3d at 1063 (“By contrast, EPA’s ability to determine whether penalties should be assessed for CAA violations extends only to administrative penalties, not to civil penalties imposed by a court.” (citation omitted)). The commenter stated that, at the very least, the EPA should affirmatively state in the final rule that it will not seek administrative penalties for excess emissions caused by malfunctions.

**Response:** The commenter contends that the U.S. Court of Appeals for the D.C. Circuit decision (*NRDC v. EPA*) vacating affirmative defense provisions for the Portland Cement rule says nothing about the validity, under the statute, of the EPA to declare unavoidable emissions associated with SSM events to be violations in the first place and asserts that relying on case-by-case enforcement discretion to address violations caused by malfunctions does not satisfy the purpose of CAA section 112 of reducing HAP emissions because it will not prevent or reduce emissions. We disagree. Applying the existing subpart MM MACT emissions standards at all times meets the CAA’s purpose in section 112 and, as enforceable emissions standards, limits HAP emissions in accordance with the CAA. In addition, in the event that a source fails to comply with an applicable CAA section 112(d) standard as a result of a malfunction event, the EPA’s ability to exercise its case-by-case-enforcement discretion to determine an appropriate response provides sufficient flexibility in such circumstances.

The commenter also contended that the EPA could include many of the concepts that it incorporated into the affirmative defense provisions into alternative, work practice standards that would apply during malfunctions and that this would be entirely consistent with the holding of *NRDC v. EPA*. We disagree. As discussed above (see response to comment 4.3-01), we are not required to account for malfunction emissions in establishing section 112 standards, and based on the information available to the EPA concerning compliance by sources with subpart MM standards, we find no reason to do so.

Regarding the concerns that enforcement discretion is “woefully inadequate” from a facility’s perspective and that sources may be required to defend against a citizen suit or state enforcement, as the Court recognized in *NRDC*, in an EPA or citizen enforcement action, the court has the discretion to consider any defense raised and determine whether penalties are

appropriate. *NRDC*, 749 F.3d at 1064 (arguments that violation was caused by unavoidable technology failure can be made to the courts in future civil cases when the issue arises). The same is true for the presiding officer in EPA administrative enforcement actions. Under section 113(e) of the CAA, the Administrator or the court considers a wide variety of factors in determining what penalty to assess, including compliance history and good faith efforts to comply. However, we disagree with the commenter's suggestion that the EPA limit its discretionary authority by affirmatively stating in the final rule that it will not seek administrative penalties for excess emissions caused by malfunctions.

## 4.4 General Duty

**4.4-01 Comment:** Commenter 0168 noted that the EPA has proposed a new "general duty" requirement, applicable at all times, in §63.860(d). The commenter argued that the EPA does not explain the legal authority for such a provision, however. See 81 FR 97077. According to the commenter, such a provision, if it is an emissions standard that the EPA would promulgate under CAA section 112, would provide a section 112-compliant emissions standard that applies during malfunction events. The commenter concluded that, if subpart MM sources were exempt from compliance with the numerical emission limitations included in revised subpart MM (as the EPA determined appropriate in promulgating the subpart MM standards in 2001, and as they should be, since those emission limitations do not reflect available technology or the performance of best-performing sources during malfunction events), then the revised subpart MM standards would in fact contain a set of section 112-compliant emissions standards that apply at all times, as the 2008 *Sierra Club* decision requires. If, on the other hand, the EPA were to claim that §63.860(d) is not promulgated pursuant to the EPA's rulemaking authority in CAA section 112, the commenter argued that the EPA would not have identified any statutory authority for it to include §63.860(d) in the revised subpart MM standards.

In a related comment, commenter 0170 argued that the EPA has not justified adding new "general duty" language to the subpart MM standard. The commenter noted that the EPA proposed to replace the NESHAP General Provisions section that establishes a "general duty" to operate a source consistent with safety and good air pollution control practices for minimizing emissions, 40 CFR 63.6(e)(1), with somewhat different "general duty" language in proposed §63.860(d). The commenter pointed out that the D.C. Circuit did not vacate the provision the EPA proposes to replace, 40 CFR 63.6(e)(1), in *Sierra Club v. EPA* (which vacated the "exemption" for SSM events in 40 CFR 63.6(f)(1) and (h)(1), not the requirement for good air pollution control practices), and, contrary to the EPA's assertion in the preamble to the proposed rule, 40 CFR 63.6(e)(1) does not reference provisions that were vacated in *Sierra Club v. EPA*. Compare Table 1, 81 FR 97092 with 81 FR 97077. The commenter asserted that the Agency must provide a cogent explanation of why the old rule was unacceptable and the new rule is necessary; the EPA has not done so here. The commenter contended that the proposed new general duty provisions should be deleted.

Commenter 0170 also stated that the EPA should simply delete proposed §63.860(d) from the final rule. If the EPA fails to do so, however, the commenter indicated the EPA would need to re-propose the provision with some explanation of the basis and purpose for the provision, to allow the public an opportunity to provide meaningful comments, as required by CAA section 307(d)(3).

**Response:** We disagree with the commenter and their assertion that we lack the authority to make the changes proposed. We explained in the proposal that we were adding language to this regulation to replace General Provision requirements that reference vacated SSM provisions. See 81 FR 97075-77. To be consistent with the *Sierra Club* decision, we have modified the general duty requirements that were contained in 40 CFR 63.6(e) and placed them, modified, in §63.860(d). We modified the general duty requirement language to remove references to SSM plans that are no longer required and no longer apply in the absence of SSM exemptions, and references to SSM periods which are no longer exempt from applicable standards, but periods during which the general duty still applies.

## 5. Testing and Monitoring

### 5.1 Periodic Emissions Testing

**5.1-01 Comment:** Commenter 0173 supported the EPA's proposed updates to the periodic emission testing requirements in the standards. The commenter stated that the updates are well-supported and legally required as part of meeting the EPA's statutory obligations, and the EPA must finalize the updates it has proposed.

Multiple commenters (0166, 0168, 0169) expressed concern about the EPA's proposal to require repeat performance testing "within 3 years of the effective date of the revised standards and thereafter before renewing their 40 CFR part 70 operating permit but at intervals no longer than 5 years following the previous performance test." Commenter 0169 argued that the EPA's requirement for additional performance testing before renewing a Title V permit is an excessive compliance burden on facilities and stated that the repeat performance testing should have a consistent and routine schedule.

Multiple commenters (0168, 0171) argued that the phrase referring to renewal of the Part 70 permit is confusing and unnecessary. The commenters asked whether the EPA is intending to require retesting prior to submittal of the permit renewal application, during the draft permit period, or prior to the renewed permit being issued. The commenters also asked what specific timing is the term "before" referencing. Commenter 0169 noted that states require applications up to 18 months before permits expire and proceed with drafting and issuing permits as state resources become available. Commenter 0168 noted that, in many states, it can take years for facilities to be issued a Title V renewal permit after the application is submitted because the permitting agency's limited resources are typically focused on reviewing and issuing construction permits instead of Title V renewal permits.

Commenter 0168 noted that a facility may conduct a repeat test after the subpart MM RTR revisions are finalized and then it may be more than 5 years after that test before its renewal permit is issued. Commenter 0166 was concerned that setting the subsequent retesting schedule based on the renewal date of the Title V may require retesting very close to the initial testing obligation. As an example, the commenter noted that one of their facilities has a Title V renewal due on July 7, 2021. According to the commenter, with the proposed initial and resampling obligations, the initial sampling obligation would be before 12/1/2020 and a retest would be required by 7/7/2021, which are only 8 months apart.

Multiple commenters (0166, 0168, 0169) recommended that the wording linking repeat testing to permit renewal should be struck. Commenters 0166 and 0168 requested that repeat testing instead simply required in the 5<sup>th</sup> calendar year following the last test. Commenter 0168 stated that it does not make sense to link renewal of the Title V permit with subpart MM repeat testing, and the EPA did not make this link in the subpart S RTR when it added repeat testing, so the commenter is unclear on why the link is being proposed here.

Commenter 0169 stated that the repeat performance testing period should be once every 10 years. According to the commenter, there is a difference between conducting a performance test under normal operating conditions for Title V permit purposes and the type of testing

required for a performance test under 40 CFR part 63. The commenter stated that, because part 63 rules require the establishment of parameter ranges from monitoring conducted during a performance test, control equipment settings are minimized to establish a margin of compliance. The commenter further stated that, because control equipment has to be set to non-normal conditions, repeat performance test results should not be used within the EPA's Web Factor Information Retrieval System (WebFIRE) to develop emission factors. The commenter noted that repeat performance test results, where minimum parameter ranges are established, are often not used by the facility for emission inventory reporting purposes, because control equipment settings are minimized and emissions can be higher than normal as a result of this. According to the commenter, these results do not represent how the source operates throughout the year. The commenter recommended that the repeat performance test period should be once every 10 years, and testing under normal operating conditions should be left to frequencies established by states in source Title V permits. Commenter 0169 argued that repeat performance testing is a costly burden for facilities, because additional compliance test conditions have to be added to the stack testing campaign to obtain data under normal operating conditions.

**Response:** We have reviewed the above comments and agree with commenters that tying the timing for periodic emissions testing to Title V permit renewal in the subpart MM rule language could be considered confusing and could unnecessarily complicate the rule. Therefore, for the final rule, we are not finalizing the proposed provision requiring sources to conduct the test "before renewing their 40 CFR part 70 operating permit." Sources are simply required to conduct the test "no longer than 5 years following the previous performance test." Although a connection to Title V permit renewal is no longer mentioned in the rule language, the final rule retains the 5-year testing interval because it correlates approximately with the schedule for permit renewals set forth in 40 CFR part 71, subpart A and mirrors the 5-year testing requirements of subpart S and subpart BBa. The similar schedule may allow the facility to save on mobilization costs of testing contractors by coordinating the test programs. Periodic performance tests, in conjunction with the continuous monitoring, provide a more complete measure of source compliance. Requiring periodic performance tests will help ensure that control systems are maintained properly over time, and a more rigorous testing requirement will better assure compliance with the standard.

As part of the 2011 ICR, the EPA collected information on testing frequency for subpart MM units. Of the estimated 483 emission units subject to subpart MM, 179 units were already performing repeat testing at a 5-year interval or less. It is possible that additional units are testing at a similar interval because data on testing frequency was not available for 241 units. For the final rule, cost impacts due to repeat testing were assessed for all units without frequency data and for those with frequencies longer than 5 years.

We disagree with the commenter that repeat performance test data should not be used within WebFIRE for the purpose of emissions factor development. Though the control device parameters being set may be outside of the operating range, they are still within the permissible range of operation, which would be considered in the realm of possible normal operation.



## 5.2 CPMS Operating Limits

**5.2-01 Comment:** Multiple commenters (0168, 0169, 0171) objected to the proposed provisions at §63.864(j) that discuss how operating parameter limits are developed and recommended that they should be modified. The commenters noted that the proposed language states that the average of each test run is to be used. The commenters argued that use of the test average conflicts with the language in subpart MM that allows the operating parameter limits to be expanded based on additional test data. If the operating parameter limit is only to be based on the average of all test data, the commenters argued that the facility does not have adequate flexibility in establishing an operating limit that allows for the full range of operation of the process.

Commenters 0168 and 0171 argued that the proposed methodology also conflicts with that in recent MACT rules that allows use of the lowest or highest individual test run to be used. The commenters noted that Boiler MACT at 40 CFR 63, subpart DDDDD, Table 4, allows the lowest 1-hour average value during a performance test to be used to establish operating parameters such as scrubber flow, scrubber differential pressure, and ESP power. Because performance tests are typically required to be conducted at conditions close to maximum throughput, the commenters indicated that sometimes additional test runs are conducted to demonstrate compliance is achieved at lower throughputs and to expand monitoring ranges. The commenters also noted that some control device operating parameters, like total ESP power and scrubber pressure drop, are influenced by throughput or exhaust gas flow. Therefore, the commenters concluded that flexibility in use of the hourly average value obtained during a test run and not the test average is important to establishing operating parameter limits that allow for a compliance demonstration at operating conditions below full load. Although most furnaces and kilns typically operate at or near capacity, the commenters noted that some units can operate for periods of time at lower throughputs, especially if one kiln or furnace serves multiple pulping lines.

Commenter 0169 suggested that parameter monitoring ranges should be allowed to be established from minimum or maximum 1-hour values during performance testing, not as an average of the associated test runs. The commenter stated that stack test conditions are difficult to set up for establishing minimum control equipment parameters. For example, the commenter noted that scrubber system valves need to be partially closed which are normally open. The commenter noted that these strained conditions are optimally achieved in short durations, and a single stack test run can show process emissions are not in excess of the standard under these controlled conditions.

Commenters 0168 and 0171 stated that the ability to confirm the established operating limit during subsequent testing (and not the requirement to reestablish the operating limit during each 5-year test) is another important element of flexibility needed in subpart MM. The commenters suggested that the rule should explicitly allow facilities to confirm operating parameter limits during each performance test and should not require facilities to reset operating parameter limits upon each test. The commenters indicated that this flexibility is needed for the reasons they provided above – the body of test data should show the unit can comply over a range of operating conditions and the facility should not be forced to ratchet down operating parameter limits during each performance test. The commenters pointed out that operators

typically allow a margin of safety instead of running right at each limit. In addition, the commenters noted that some units might be subject to more stringent permit limits (*e.g.*, due to BACT) and may have a large margin of compliance with the subpart MM limit. Similar to the allowance provided for adjustment of the PM CPMS operating parameter limit in Boiler MACT, if tested emissions are less than 75 percent of the subpart MM PM limit, the commenters recommended that subpart MM operating parameter limits should be allowed to be adjusted to a level that is 90 percent of the value during the test to allow for some operational flexibility. Commenter 0168 noted that some states already allow operating parameters to be set at 90 percent of the value during the test, provided an adequate margin of compliance was demonstrated.

**Response:** In response to this comment, the final rule has been revised to allow minimum operating parameter limits to be established based on the lowest of the 1-hour values recorded during a performance test demonstrating compliance with the applicable emission limit. In addition, a sentence was added to §63.864(j)(4) to state that previously-established operating limits may be confirmed during subsequent testing or the operating limits may be reestablished. It is also noted that §63.864(j)(2) and (3) state that facilities can conduct additional performance tests to establish expanded or replacement operating limits. With these added flexibilities, and because the final rule already contains an allowance of up to 5 operating limit averages in different 24-hour periods before monitoring exceedances are considered to be a violation, we did not also include the commenter's suggested 90 percent adjustment for minimum operating parameter limits.

**5.2-02 Comment:** Multiple commenters (0168 and 0171) argued that deviations from operating parameter limits should not be automatic violations. The commenters recommended that the EPA incorporate into subpart MM the provision in Boiler MACT at §63.7540(a)(1) that states that operating below established operating limits is not a deviation during performance testing. The commenters also recommended that, similar to the provision in Boiler MACT at §63.7575, the EPA should state that a deviation from an operating limit is not always a violation. According to the commenters, if facilities experience a period of operation below a minimum operating parameter limit, it should not be presumed that they are in violation of the applicable emission limit as long as they can conduct a repeat performance test within 60 days (waiving the 60-day notice requirement) to demonstrate emissions are below the applicable limit when the control device is at the lower operating parameter levels.

**Response:** Deviations, referred to as “monitoring exceedances” or periods of “excess emissions” under subpart MM, include parameter monitoring averaging periods below the minimum operating limits established during a performance test that demonstrates compliance. Deviations under subpart MM are not violations unless there are 6 or more parameter monitoring exceedances in different 24-hour periods as specified in §63.864(k)(2) and (3). Section 63.867(c)(3) states, “Reporting monitoring exceedances does not constitute a violation of the applicable standard unless the **violation** criteria in §63.864(k)(2) **and** (3) are reached.” (emphasis added).

Section 63.864(j)(4) states that multiple performance tests may be conducted to establish a range of parameter values. A statement was added to §63.864(j)(4) of the final rule that operation outside a previously established parameter limit during a performance test to expand

the operating limit range does not constitute a monitoring exceedance. For example, operating below a minimum parameter limit during a performance test would not be considered a monitoring exceedance. We are not amending the rule to allow a repeat performance test within 60 days of an exceedance to retroactively demonstrate that an exceedance is not an exceedance, as the existing language in §63.864(k)(2) and (3) allows sufficient operating flexibility for the facility to arrange to perform a new performance test without cumulative exceedances meeting the definition of a violation.

**5.2-03 Comment:** Multiple commenters (0166, 0168) suggested that the EPA should define minimum data requirements for non-opacity CMS in developing the hourly averages that are used in calculating the 3-hr average. According to the commenters, neither the subpart MM RTR proposed rule nor the existing subpart MM rule address the question about minimum data required to develop a valid 3-hour average. The commenters proposed that the EPA use language from 40 CFR 63.8(g)(2) as a model, and suggested the following:

Data from CMS for measurement of operating parameters other than opacity shall be reduced to 1-hour averages computed from four or more data points equally spaced over each 1-hour period, except during periods when calibration, quality assurance, or maintenance activities are being performed. During these periods, a valid hourly average shall consist of at least two data points with each representing a 15-minute period. Alternatively, an arithmetic or integrated 1-hour average of CMS data may be used.

Commenter 0166 suggested that the EPA should consider substituting references to CMS rather than CEMS along with excluding reference to maintenance activities as required "pursuant to provisions of this part" (because there are no specific maintenance procedures for parametric monitors required by the rule). Commenter 0168 suggested that the EPA should also add a provision that exempts CEMS, COMS, or CMS data from being recorded as monitor downtime during a calibration.

**Response:** We are not including the suggested minimum data availability requirement in the final rule because this requirement was not proposed for stakeholder comment and could potentially create a burden for facilities that are not currently calculating 3-hour averages based on an intermediate 1-hour block average.

Section 63.864(h) of subpart MM states that "monitoring data recorded during periods of unavoidable CMS breakdowns, out-of-control periods, repairs, maintenance periods, calibration checks, and zero (low-level) and high level adjustments must not be included in any data average computed under this subpart." Regarding the request to exempt calibrations from being recorded as monitor downtime, we note that inclusion of the duration of QA/QC calibrations has been required in the CMS performance summary report under both the NSPS and NESHAP general provisions for years. See 40 CFR 60.7(d) (Figure 1) and 40 CFR 63.10(e)(3)(vi)(J). The final rule for subpart MM continues to consider calibrations as part of CMS downtime. Additional discussion of COMS calibrations is provided in response to comment 6.4-03.

**5.2-04 Comment:** Multiple commenters (0166, 0168, 0169, 0171) argued that the EPA should not delete §63.864(k)(3). The commenters noted that the EPA proposed to delete

§63.864(k)(3), providing that no more than one non-opacity monitoring exceedance will be attributed in any 24-hour period.

Commenter 0166 stated that elimination of this provision would only reduce their facilities' compliance margin and increase their enforcement exposure without any commensurate reductions in emissions or risk. The commenter also noted the EPA's finding that the floor technology has not advanced since the original rule was promulgated and, therefore, stated that the EPA is not justified by technology advances to eliminate this provision in the rule.

The commenters noted that facilities may experience consecutive 3-hour periods where operating parameter values are out of range as part of the same event, despite a facility's best efforts to take corrective action as soon as possible. The commenters contended that the proposed revisions increase the reporting burden by treating each 3-hour exceedance as a separate event, even if the periods are consecutive. Commenter 0169 argued that this is especially problematic for mills using a 3-hour rolling average.

Commenter 0166 stated that, even if the exceedances occur sequentially on the same day from the same event, requiring facilities to count all of them toward the "allowed" five exceedances (with the sixth triggering a violation) would unfairly penalize sources that take effective corrective action but cannot reasonably prevent the occurrence of multiple parameter exceedances. The commenter also noted that subpart MM does not currently specify that the 3-hour wet scrubber CMS are averaged over 3-hour blocks or 3-hour rolling periods. The commenter noted that states have not been consistent in applying this averaging period. According to the commenter, a facility with a 3-hour rolling average consumes the five allowed 3-hour averages in as little as 7 hours. The commenter stated that their manufacturing facilities attempt to minimize any out-of-range parameter, but on the occasion that a deviation does occur, corrective action necessary to bring the parameter back into range may take several hours, further accumulating the number of exceedances the facility can experience.

Commenter 0169 noted that a source can also experience concurrent flow and pressure drop operating values out of range as part of the same event. With the removal of the 24-hour defined period, the commenter indicated it is unclear how to count concurrent parameter events for the purposes of determining a noncompliance count. The commenter argued that removal of the 24-hour defined period will increase the number of reported violations, is excessively burdensome, and is potentially very costly to the pulp and paper industry.

The commenters recommended that the provision should be retained, and facilities should be allowed to segregate any exceedances by event for simpler reporting, and not by individual 3-hour period.

**Response:** In response to this comment, we are not taking any final action to eliminate or in any way revise §63.864(k)(3). We recognize that one event could trigger multiple 3-hour exceedances in a 24-hour period, especially for facilities that may be using a 3-hour rolling average. As originally promulgated, subpart MM did not specify whether 3-hour averages were to be reduced to 3-hour block or 3-hour rolling averages. As a result, commenters brought to our attention that some facilities are currently using block averages while others are using rolling averages. Keeping in place the current provision in §63.864(k)(3) that no more than one

exceedance will be attributed in any given 24-hour period avoids creating a difference in the compliance obligation between the two monitoring approaches.

**5.2-05 Comment:** Commenter 0166 noted that the EPA has proposed to clarify that the emissions limits only apply (and therefore that there can only be excess emissions) when the affected source is either firing lime mud or BLS, as applicable. The commenter noted that this proposal would align subpart MM with NSPS subpart BBa, which the commenter believes also clarified subpart BB and better aligns reporting and recordkeeping requirements at the affected facilities. The commenter supported this clarification and requested that the EPA provide further clarification by using the term "fed" rather than "fired."

**Response:** Although the EPA views the terms "fed" and "fired" to mean the same thing in the context of the equipment subject to subparts MM and BBa, we have revised the final subpart MM rule to use the term "fed" when referring to the times when BLS are burned in a recovery furnace and lime mud is charged into the lime kiln for calcining.

### 5.3 Other Comments

**5.3-01 Comment:** Commenter 0169 stated that the EPA's proposed requirement that the Administrator specify test conditions is unreasonable. The commenter noted that proposed §63.865 states that performance tests shall be conducted under "such conditions as the Administrator specifies to the owner or operator based on representative performance of the affected source for the period being tested. The owner or operator may not conduct performance tests during periods of malfunction. Upon request, the owner or operator shall make available to the Administrator such records as may be necessary to determine the conditions of performance tests."

Depending on what "conditions" the Administrator specifies, commenter 0169 stated that it may be impossible to conduct performance testing in the time frame required, while simultaneously meeting all the conditions the Administrator or their designee may specify. The commenter stated that this new provision makes it unnecessarily difficult to develop testing protocols and successfully conduct performance tests. The commenter asserted that a performance test should be conducted under normal maximum operating conditions, taking into account real-world constraints and considerations. For example, the commenter noted that the actual load or capacity to which any recovery furnace or lime kiln can operate depends on the capacities of tanks holding liquor and the demand for pulp and steam from paper machines. According to the commenter, a number of other short-term process fluctuations and unplanned events can have an impact on pulp production and supporting operations. The commenter noted that mills provide stack test notice 60 days in advance and plan for stack tests in good faith to run under conditions that represent normal operation. The commenter noted that normal operation includes many load conditions and load mixes at mills with multiple lines and multiple control equipment settings. The commenter suggested that the rule should simply require that performance tests be conducted under normal operating conditions. The commenter further noted that special conditions and alternative operating scenarios (such as running with ESP banks and sides down) are addressed in Part 70 operating permits, which also address the compliance demonstration requirements for these scenarios.

**Response:** The proposed language in §63.865 was revised for the final subpart MM rule to refer to “normal operating conditions” and eliminate the phrase “under such conditions as the Administrator specifies to the owner or operator.” A parenthetical was added to describe “representative performance” as “performance based on normal operating conditions.” The proposed rule language was included in subpart MM as a replacement for similar language in 40 CFR 63.7(e)(1) that is no longer entirely applicable because it stated that periods of SSM would not be considered a violation. The edits made for the final subpart MM rule convey the same intent as proposed.

## 6. Recordkeeping and Reporting

### 6.1 Recordkeeping and Reporting Requirements

**6.1-01 Comment:** Multiple commenters (0164, 0166, 0168, 0169) objected to the new excess emissions recordkeeping and reporting requirements and recommended they be revised. Because the EPA has proposed to eliminate the requirement to develop and follow an SSM plan, the commenters noted that the EPA proposed to add requirements for additional recordkeeping and reporting for excess emissions. The commenters noted that, at §63.866(d)(2), the EPA proposes to add the following additional recordkeeping: “For each failure to meet an applicable standard, record and retain a list of the affected sources or equipment, an estimate of the quantity of each regulated pollutant emitted over any emission limit and a description of the method used to estimate the emissions.” The commenters further noted that, at §63.867(c)(4), the EPA proposes to require reporting of this information in the excess emissions report. While it may be possible to apply engineering judgment and estimate excess emissions if a control device fails completely, the commenters argued that it is impossible to estimate excess emissions as a result of a violation of monitoring requirements without extensive and costly testing of the source under those conditions.

Commenter 0166 stated that if the facility utilized a CEMS, an estimated emissions rate could be established, but there are no CEMS in subpart MM. The commenter further stated that determining the amount of excess emissions via engineering testing of the emissions rates would not be practicable because sources would have to knowingly violate the emissions limitation while conducting the test.

According to the commenters, since parameter values are set based on operations during periods where compliance demonstration tests prove that emissions standards are being met, and since the EPA does not provide a regulatory mechanism to authorize or protect companies from failed tests, no information is available to reliably predict the absolute minimum operating conditions required for compliance nor estimate emissions if those conditions are not met. As such, the commenters argued that parameter values are reliable indicators of compliance, but cannot be used to determine noncompliance. The commenters indicated they do not have a way of estimating the quantity of excess emissions that occur when scrubber or ESP parameters are slightly below the applicable operating parameter limits or when opacity is slightly above the applicable operating parameter limit. Although the operating parameters are indicators of compliance with the PM limit, the commenters noted that the stack test used to develop the operating parameter limits may have demonstrated that the unit has a large margin of compliance with the PM limit (particularly if a lower BACT limit applies to the unit), so a monitoring violation may not actually result in emissions in excess of the standard. According to the commenters, any attempt to estimate excess emissions in most scenarios would not be accurate and would be of little value.

Commenter 0169 noted that the range of expected emissions can vary significantly depending on the circumstances of the failure to meet an operating range. According to the commenter, if a wet scrubber flow average is one gallon per minute less than the operating range established during the performance test, it is not likely that the source experienced emissions greater than the standard; if control equipment has a catastrophic failure, process equipment will

be shut down. Estimating the quantity of each regulated pollutant will be extremely burdensome, will result in over-reporting and inaccurate emissions, and should not be required. Furthermore, it is not reasonable to certify compliance in a semiannual report that emissions are in excess of the standard based on a theoretical estimate of emissions.

**Response:** The proposed excess emissions spreadsheet reporting template and the proposed recordkeeping and reporting language in §63.866(d)(2) and §63.867(c)(4) contained language that required the estimating of the quantity of each regulated pollutant emitted over the standard for any failure, including emission limits and operating limits. In response to this comment, we revised the language in the final rulemaking package to require emissions estimates to be provided in the semiannual report for failures to meet “emission limits,” such as the PM (HAP metal), methanol, or total hydrocarbon (THC) limits contained in subpart MM. We also revised the *Failures tab* in the excess emissions reporting spreadsheet template accordingly so that it is consistent with the revisions to §63.866(d)(2) and §63.867(c)(4) for the final rule. Failures to meet emission limits are likely to be discovered during repeat stack tests, which provide a quantitative means for estimating emissions. Failures also include violations of opacity and parameter operating limits as specified in §63.864(k)(2), which are required to be reported with the corresponding number of failures, and the date, time, and duration of each failure in the semiannual report. The final rule does not require reporting of an emissions estimate associated with failure to meet an opacity or parameter operating limit, but does require facilities to maintain sufficient information to provide an emissions estimate if requested by the Administrator.

We are retaining the requirement to report an estimate of the quantity of each regulated pollutant emitted over any PM (surrogate for HAP metals), methanol, or THC emission limit under §63.862 and a description of the method used to estimate the emissions over the emission limit. Examples of such methods could include mass balance calculations or engineering judgment based on known process parameters. This requirement will ensure that there is adequate information to allow the EPA to determine the severity of the failure to meet an applicable standard and to provide data that may document how the source met the general duty to minimize emissions during an exceedance event.

**6.1-02 Comment:** Commenter 0173 stated that the EPA should require additional reporting and corrective action, when exceedances and violations occur to assure compliance with the standards and to recognize that such requirements are developments that the EPA can and should require under section 112(d)(6).

Commenter 0173 argued that the past history of the SSM exemption for pulp mills demonstrates the need for the stronger and more frequent monitoring, testing, and reporting requirements described above, and additional enforcement provisions. According to the commenter, the EPA must implement strong enforcement provisions to prevent and remedy emission spikes, malfunctions and other violations in a way that will be enforceable by citizens in the Title V permits for these facilities.<sup>136</sup> Considering that the emissions from this source

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<sup>136</sup> See, e.g., New York Public Interest Research Group & Earth Day Coalition, *The Proof Is In the Permit: How to Make Sure a Facility in Your Community Gets an Effective Title V Air Pollution Permit* (June 19, 2000), <http://www.cacwny.org/docs/Title%20V%20-%20The%20proof%20is%20in%20the%20permit.PDF>.



category causes disproportionate risk in minority and economically disadvantaged communities, the commenter asserted that additional monitoring and stronger enforcement provisions would help provide EJ. As discussed in section 3.2.2.4 of this document, the commenter also stated that the EPA must finalize strong continuous emission monitoring and fence-line ambient air monitoring to assure compliance.

The commenter stated that the EPA must promulgate specific public reporting and notification requirements for malfunctions, or any emission exceedance that occurs, as discussed below:

First, commenter 0173 stated that the EPA must require e-mail and telephone reporting by the facility to the EPA (not just a state regulator) no later than 24 hours after the any excess emissions or exceedance. According to the commenter, the EPA must require that when a facility provides the EPA with telephone notification of a malfunction or emission exceedance under the regulations, this notice will be made publicly available on the EPA's website and through the EPA's Enforcement and Compliance History Online (ECHO) system within 24 hours. In addition, the commenter stated that the EPA should require that the EPA Administrator provide this information to its Regional office within 24 hours of receiving notification, and direct the Regional office to notify the local community on the Internet, by direct communication, and through all available means.

Second, commenter 0173 stated that the EPA must promulgate the requirement that when such notification is made, the facility must also provide for community notification of the malfunction or emissions standard exceedance within 24 hours, through an appropriate public forum that is designed to reach residents who live near the facility, including but not limited to a notice on the facility's own website (if it has one), a written notice to the local municipality and local school district, and a press release to the local newspaper, radio, and TV news station that contains any information community members may need to try to protect themselves and their families from the additional air pollution.

Third, commenter 0173 stated that the EPA should also require a written report to be submitted within 7 days, and use the same distribution method as outlined above, including publication on ECHO, the EPA's Regional website, and distribution to active local community members who are interested (such as through setting up an email list, a local listserv, Twitter, and other media). The commenter stated that, in the written report, the EPA should require the facility to report: (1) the nature of the event; (2) the duration of the event; (3) emissions released during the event; and (4) a description and timing of corrective actions that were taken and any planned to be taken. The commenter also stated that the EPA should require a follow-up report within one week providing information on whether the problem was ended or corrected, including monitoring data showing that the problem no longer exists. If the problem was not ended or corrected, the commenter stated that the report must explain what additional steps are planned and the EPA must provide these reports on-line in a format that the public can access.

Fourth, commenter 0173 indicated that a prohibition on and reporting of malfunctions or other exceedances are not enough to protect the most exposed people from the HAP emissions from the source category under review in this rulemaking. The commenter stated that the EPA also must promulgate additional requirements that apply in the event of a malfunction or

violation of the emissions standards. The commenter noted that the EPA has recognized that the CAA requires continuous compliance with the emissions standards.<sup>137</sup> The commenter asserted that facilities must not be able to emit in an unlimited manner for any period of time.

The commenter concluded by saying that, in addition to the removal of the exemptions and addition of reporting requirements the EPA has proposed, the EPA also should require the following when an exceedance, malfunction, or accidental release occurs:

- The EPA must require automatic shut-off of the malfunctioning equipment or process for the time needed to take corrective action whenever an exceedance or malfunction occurs.
- The EPA must require facilities to keep on-site spare parts to pollution controls (like ESP wires or bags in fabric filters), so that they can more quickly put controls back online if they malfunction.
- The EPA must assign responsibility and liability to the plant manager or a high-up staff member which allows only that person to restart the equipment or process.
- The EPA must require specific corrective measures to be taken immediately to remedy and prevent recurrence of the malfunction or violation.
- For a facility that has had one or more malfunction, exceedance, or other violation incident in the prior month, written authorization by the EPA must be required to restart equipment or processes. The EPA should only authorize restart after making a public determination that provides information on the corrective measures that the EPA is requiring. The EPA should release this public determination on the Internet and require its Regional office to communicate this determination to all interested members of the public, including local community representatives.
- If a facility has more than four exceedances or malfunctions during the same quarter, then the EPA must require automatic shutdown of the operation for a period of time needed to conduct and publish a full investigation and ensure systematic correction of the problems.
- The EPA should create a community complaint mechanism in the standards that ensures that citizen complaints of clouds, plumes, exceedances, odors, other air pollution incidents or health concerns receive an immediate response, in which the EPA commits to initiate an investigation and provide a publicly available report of the result of the investigation, including whether it leads to an enforcement outcome from the EPA's enforcement division within 7 days.

**Response:** We disagree with the commenter that the suggested additional requirements regarding malfunctions or violations are necessary. The EPA has determined that the current reporting requirements are sufficient to determine compliance and ensure appropriate data are available to the EPA and the public. Malfunction reporting provisions are established in the NESHAP General Provisions (40 CFR part 63, subpart A) and these final amendments do not alter those provisions. The final rule requires malfunction recordkeeping and reporting, including for each failure to meet a standard, the date, time, and duration, a list of the affected sources or equipment, an estimate of the amount of each regulated pollutant emitted over the standard, a description of the method used to estimate such emissions, and actions taken to minimize emissions and any corrective actions taken. Any such reports submitted to the EPA are publicly available under the provisions of 40 CFR 63.15. Further, the General Provisions specify that

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<sup>137</sup> See *Sierra Club v. EPA*, 551 F.3d 1019, 1028 (D.C. Cir. 2008).

submittal of a report to a State that has been delegated the authority to implement the provisions of part 63, constitutes submittal of a report to the Administrator.

We also disagree with the commenter that suggested that the EPA must require automatic shut-off of the malfunctioning equipment or process for the time needed to take corrective action whenever an exceedance or malfunction occurs. In the event of a malfunction, it is not feasible to instantaneously shut off the affected sources within this source category and automatic shut off of malfunctioning equipment may not ensure that emissions are minimized. Owners or operators must, at all times, operate and maintain any affected source, including associated air pollution control equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions.

Regarding citizen complaints, the EPA notes that the enforcement provisions of the final rule are enforceable by citizens. A citizen suit claim under CAA section 304 allows citizens to commence a civil action against any person alleged to be in violation of “an emission standard or limitation under this chapter.” In exercising its authority under CAA section 112 to establish emissions standards at a level that meets the stringency requirements of CAA section 112, the EPA necessarily defines conduct that constitutes a violation.

Finally, we note that under the Superfund Amendments and Reauthorization Act (SARA)/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)/Emergency Planning and Community Right-to-Know Act (EPCRA), the EPA requires immediate emergency release notification requirements and written follow-up notice for releases of hazardous substances. The EPA has determined that requiring this type of notifications in the final rule would be duplicative and would not enhance compliance beyond what is already required.

**6.1-03 Comment:** Commenter 0168 indicated that some specific reporting requirements are unclear. The commenter noted that Table 1 of Subpart MM indicates that all of the provisions in 40 CFR 63.10(e) apply to subpart MM. However, according to the commenter, §63.867(c)(1) states that the Summary Reports “must contain the information required in §63.10(e)(3), as specified in paragraphs (c)(1)(i) through (x) of this section. When no exceedances of parameters have occurred, the owner or operator must submit the summary report stating that no excess emission occurred during the reporting period. In addition to a statement verifying that no excess emission occurred during the reporting period, this report must contain the information required in §63.10(e)(3) only as specified in paragraphs (c)(1)(i) through (x) of this section.” The commenter stated that this language is confusing, as noted in the bullets below, and should be clarified in §63.867(c)(1) as well as Table 1. The commenter suggested that Table 1 should state that 40 CFR 63.10(e)(3) applies as indicated in §63.867(c)(1) and (3).

Regarding the statements in the proposed rule that the Summary Reports contain the information required in 40 CFR 63.10(e)(3) as (or only as) specified in paragraphs (c)(1)(i) through (x), the commenter stated the following:

- It is not clear whether the EPA intended (c)(1) and (c)(1)(i) through (x) to be a restatement of 40 CFR 63.10(e)(3) or to apply in lieu of 40 CFR 63.10(e)(3).

- 40 CFR 63.10(e)(3) addresses more than Summary Report content; as such, §63.867(c)(1) would be clearer if it referenced only the provisions in 40 CFR 63.10(e)(3) related to the Summary Report content.

Commenter 0168 noted that the requirement in the proposed rule that the Summary Reports include a statement that no excess emission occurred during the reporting period differs from the one in 40 CFR 63.10(e)(3)(v), which states “When no excess emissions or exceedances of a parameter have occurred, or a CMS has not been inoperative, out of control, repaired, or adjusted, such information shall be stated in the report.” According to the commenter, it is unclear if the report content requirements of §63.867(c)(1), which requires a statement regarding only excess emissions, override this General Provisions requirement, which requires a statement regarding both excess emissions and CMS downtime.

The commenter noted that, as part of the specific identification of each period of excess emissions and parameter monitoring exceedances under §63.867(c)(3)(iii), proposed §63.867(c)(3)(iii)(A)(2) includes the number of 6-minute averages in the reporting period that were removed due to invalid readings. According to the commenter, inclusion of this provision implies that invalid opacity averages are periods of excess emissions. The commenter recommended that this requirement should be removed or moved to a section of the rule addressing invalid data.

**Response:** The EPA’s intent with the revisions to §63.867(c)(1) and (3) was to pull the relevant language from the General Provisions specifying the contents of summary and detailed excess emissions reports into subpart MM to improve clarity. However, based on these comments, we recognize the duplicating the relevant portions of 40 CFR 63.10(e)(3) as proposed may have caused some confusion. To remedy this confusion, we split out the paragraphs of 40 CFR 63.10(e) and 63.10(e)(3) in Table 1 of subpart MM to more clearly indicate which sections apply or are replaced by sections in subpart MM. We revised §63.867(c)(1) to remove references to paragraphs in 40 CFR 63.10(e)(3) replaced by §63.867(c)(1). We noted in Table 1 that §63.867(c)(1) and (3) specify the contents of the summary and detailed excess emissions reports. We revised §63.867(c) to refer to the procedures in §63.867(d)(2) and 40 CFR 63.10(e)(3)(v) for submittal of the semiannual excess emission reports and summary reports.

Section 63.10(e)(3)(v) continues to apply and is not replaced with language in subpart MM. This section specifies the delivery date for the report (*i.e.*, post-marked by the 30<sup>th</sup> business day following each calendar half) and general content for the report. The final rule continues to rely on 40 CFR 63.10(e)(3)(v) for the requirement: “When no excess emissions or exceedances of a parameter have occurred, or a CMS has not been inoperative, out of control, repaired, or adjusted, such information shall be stated in the report.”

Regarding §63.867(c)(3)(iii)(A)(2), we are not finalizing the proposed requirement to include in the detailed excess emissions report the number of 6-minute opacity averages that were removed due to invalid readings. The CMS performance summary portion of the summary and detail reports provide sufficient information on the duration of invalid readings.

**6.1-04 Comment:** Commenter 0169 stated that startup and shutdown recordkeeping is unclear and burdensome. The commenter noted that, in §63.866(c)(8), the EPA proposes to

require records of the date, time, and duration of each startup and/or shutdown period, recording the periods when the affected source was subject to the standard applicable to startup and shutdown. The commenter indicated that it is unclear in the rule language what “the standard applicable to startup and shutdown” means. The commenter noted that facilities can also have both startup and shutdown events where no parameter deviations occur.

Commenter 0169 argued that no new monitoring and reporting requirements should be proposed in the rule. The commenter stated that changing startup and shutdown exemptions within the rule should not result in a new recordkeeping burden. The commenter argued that the requirement to specifically monitor the date, time, and duration of each startup and/or shutdown period is redundant to the process data already collected from a source. The commenter stated that a separate and independent record of startup and shutdown is not needed. In addition, the commenter stated that a requirement for startup and shutdown data should only be required when a source has a parameter exceedance during a startup or shutdown event.

If additional data is required, commenter 0169 contended that it should be limited to BLS fired and lime mud feed rate. The commenter noted that DAS already collect BLS and lime mud feed data to meet the daily record requirements and to meet continuous monitoring for control equipment parameter data. The commenter stated that this process data itself provides adequate information about the state of the source. The commenter noted that DAS systems can calculate the operational state of a source (down, online, startup, or shutdown) based on the liquor and mud feed rates to the source over specified averaging periods. According to the commenter, sources should only have to maintain a record of how startup and shutdown operating states have been defined for each source. The commenter asserted that compliance requirements need to be practical to what can be directly monitored electronically and not create excessive paperwork burdens.

**Response:** The §63.866(c)(8) requirement to keep “records of the date, time, and duration of each startup and/or shutdown period, recording the periods when the affected source was subject to the standard applicable to startup and shutdown,” was proposed to be added to help characterize minor exceptions to reporting during startup or shutdown (*i.e.*, the exceptions from reporting scrubber pressure drop, ESP secondary current, or ESP secondary power). Given that these were proposed exceptions to the “applicable standard during startup or shutdown,” rather than the “applicable standard during startup and shutdown” itself, we agree with the commenter that §63.866(c)(8) as proposed is of limited value in the context of subpart MM and this provision is not being finalized in the final rule. The applicable standards during startup and shutdown continue to include the emission limits (*e.g.*, PM or THC limits), operating limits (*e.g.*, opacity, wet scrubber liquid flow rate, and/or the requirement to properly operate the ESP AVC). For the final rule, we repurposed §63.866(c)(8) to require recordkeeping for facilities to show compliance with the requirement to maintain proper operation of the ESP AVC.

**6.1-05 Comment:** Commenter 0169 stated that recordkeeping and reporting should be streamlined and clear. The commenter recommended that recordkeeping and reporting in §§63.866 and 63.867 should be streamlined with the continuous parameter monitoring requirements in the rule. The commenter further recommended that recordkeeping for a deviation event, which could also be a failure, should include streamlined requirements for the

date, time, duration, source, parameter, cause of the deviation, corrective action, and general provision event category.

Commenter 0169 noted that the EPA proposed recordkeeping for violations at §63.866(b): “Record the time corrective action was initiated and completed, and the corrective action taken.” The commenter noted that records of when a corrective action is initiated and completed are inherent within the source’s monitored parameter data. The commenter further noted that parameter data restored to normal range or the shutdown of a source is included within the direct monitored data within a DAS. As an example, the commenter noted that the DAS system time stamps the event with date and time and calculates the duration; the DAS or mill reporting system then records the full duration of the event, based on the compliance averaging period. Commenter 0169 stated that the language in §63.866(b) appears to be requiring a record within a record, which adds recordkeeping burden to operations. The commenter noted that operators use direct monitored data for a timeline of events. The commenter suggested that the language in §63.866(b) should remain with the parameter monitoring in §63.866(c)(3) and should not require an additional recordkeeping requirement for the specific time of corrective action within the time-stamped period of the full event record. The commenter argued that separating out a second recordkeeping requirement adds no value to the record of an event, and adds an unnecessary recordkeeping burden on the source.

Commenter 0169 also noted the EPA proposed recordkeeping for when a unit fails to meet a standard in §63.866(d)(1): “In the event that an affected unit fails to meet an applicable standard, including any emission limit or operating limit, record the number of failures. For each failure record the date, start time, and duration of each failure along with a brief explanation of the cause.” The commenter argued that the language in §63.866(d)(1) and (d)(3) is redundant to the requirements in §63.866(b) and (c)(3). According to the commenter, parameter monitor averages inconsistent with established operating ranges should be addressed in one location, specifically §63.866(c)(3).

Commenter 0169 also suggested that recordkeeping language should also be consistent with the reporting language. The commenter noted that, for each parameter monitor, the EPA requires reports for “An identification of each exceedance by start time, date, and cause of exceedance (including startup/shutdown, control equipment problems, other known reasons, or other unknown reasons)” and further requires in §63.867(c)(3)(v) “The corrective action taken or preventative measures adopted.” The commenter stated that this is reasonable so long as each excess emission or monitoring downtime occurrence is treated as one streamlined event within the “Excess Emissions and Continuous Monitoring System Performance Report.”

Commenter 0169 noted that in §63.867(c)(1)(vii), the EPA requires reporting to include “An emission data summary, including the total duration of excess emissions (recorded in minutes for opacity and hours for gases), the duration of excess emissions expressed as a percent of operating time, and reason for the excess emissions (*e.g.*, startup/shutdown, control equipment problems, other known reasons, or other unknown reasons).” The commenter also noted that, in 40 CFR 63.10(e)(3)(vi)(I), the emission data summary is to include a “a breakdown of the total duration of excess emissions during the reporting period into those that are due to startup/shutdown, control equipment problems, process problems, other known causes, and other unknown causes.” The commenter stated that a breakdown of the reporting categories is not a

specific cause or reason; these groupings are event categories. According to the commenter, §63.867 and the reporting forms should not refer to breakdown categories as causes or reasons for the purpose of reporting deviation or failure events. The commenter stated that cause and corrective actions are separate records within the full record of the event (cause, corrective action, and then breakdown of the event category). The commenter recommended that use of the term “cause” instead of “reason” should be used in the breakdown of events for consistency with the terminology used in subpart A. The commenter noted that mill reporting systems already use the group events from the General Provisions, *i.e.*, “Other Known Causes.”

Commenter 0169 noted that the EPA’s proposed subpart MM report template does streamline the reporting requirements, and the commenter supported a streamlined reporting format (event, cause, corrective action, and breakdown). The commenter stated that rule language in §§63.866 and 63.867 should reflect the streamlined event reporting.

**Response:** In response to this comment, we have not finalized the proposed addition to §63.866(b) to, “Record the time corrective action was initiated and completed, and the corrective action taken.” We also did not finalize the proposed addition of the phrase “along with a brief explanation of the cause” from §63.866(d)(1). We are keeping similar language that was proposed to be removed from §63.866(c)(3), with a slight revision, so that this paragraph reads, “Records of parameter monitoring data... with a brief explanation of the cause of the monitoring exceedance, the time the monitoring exceedance occurred, the time corrective action was initiated and completed, and the corrective action taken.” We note that the term “deviation” originally used in subpart MM was replaced with reference to “monitoring exceedance” to be consistent with the terminology used throughout subpart MM which does not refer to “deviations” elsewhere.

Regarding the commenter’s suggestion that the recordkeeping language be consistent with the reporting language, we have determined that the promulgated language is consistent. We replaced the term “reason” with “cause” and added “process problems” to more clearly reflect the event categories denoted in 40 CFR 63.10(e)(3)(vi)(I), which is replaced in subpart MM with §63.867(c)(1). Nothing in the language prevents each excess emission or monitoring downtime occurrence from being treated as one streamlined event.

## 6.2 Reporting Frequency

**6.2-01 Comment:** Multiple commenters (0164, 0166, 0168, 0169) supported the EPA proposal to require semiannual instead of quarterly reporting and to measure against the monitoring exceedance levels on a semiannual basis instead of quarterly basis. The commenters agreed with the proposed change, as other air quality regulatory requirements, such as NESHAP subpart S and NSPS subparts BB and BBa, include semiannual, not quarterly, reporting. The commenters concluded that the change in frequency reduces burden on facilities without sacrificing any environmental protection, and the same information will be required to be reported.

**Response:** We acknowledge the commenter’s support for the change from quarterly to semiannual reporting. We are finalizing, as proposed, semiannual reporting.

## 6.3 Electronic Reporting

**6.3-01 Comment:** Multiple commenters (0168, 0169) stated that the EPA has proposed a new reporting requirement in subpart MM that will be excessively burdensome to industry and is not justified. Specifically, the commenters noted that, at §63.867(d), the EPA proposes to require electronic reporting of both test data and compliance reports.

Commenter 0168 noted that the EPA's Electronic Reporting Tool (ERT) continues to be revised and updated due to various flaws, and noted that sources struggled to complete Boiler MACT compliance reports in the EPA's Compliance and Emissions Data Reporting Interface (CEDRI) due to errors and frequent updates. The commenter argued that it is unreasonable to put sources at risk of violations (due to late or inaccurate reporting) because of EPA reporting tool issues or availability. At a minimum, the commenter suggested that the requirement to use a particular CEDRI form should stipulate that the form has been available for 1 year, per the recently signed, but not published, Part 60 electronic reporting rule.<sup>138</sup> According to the commenter, that rule also provides for a reporting extension in the event of an outage of the EPA's Central Data Exchange (CDX) or CEDRI the week prior to a report's due date. The commenter suggested that this same allowance should be provided in subpart MM if the electronic reporting requirement is finalized.

Commenters 0168 and 0169 pointed out that a number of states already specify that test reports and compliance reports be submitted in an electronic format. Since it is likely that many states eventually will be delegated authority for this rule, the commenters stated that the EPA should remove its reporting format requirement from the rule and work more closely with states to develop a universal reporting system that is not costly or redundant, does not require different electronic reporting formats, and that is not problematic and labor-intensive for data entry. According to the commenters, as proposed, the rule's requirement is an extra, excessive burden for mills. The commenters contended that the EPA needs to defer any electronic collection of data until the CDX system is fully functional, user-friendly, and streamlined with states.

If the requirement for using CEDRI for electronic reporting remains in the final rule, the commenters stated they would prefer filling and uploading the spreadsheet to fulfill the reporting requirements rather than entering the required information into a fillable CEDRI web form and increasing the chances of transcription errors, if they must choose between approaches. However, the commenters indicated their ultimate preference would be for facilities to upload their own already-formatted reports generated from their DAS, rather than reformatting the current information to fit the EPA's template.

**Response:** We disagree that the electronic reporting requirements will be excessively burdensome for industry. On the contrary, based on the analysis performed for the Electronic

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<sup>138</sup> <https://www.epa.gov/sites/production/files/2016-12/documents/e-reporting-nsps-final-rule-prepublication.pdf>. The preamble to the final signed Part 60 electronic reporting rule states that extending the compliance date for electronic reports affords facilities more time to reprogram systems that collect data for periodic reports and to become familiar with the new reporting forms. This time extension will also allow air agencies more time to implement electronic reporting and to begin making any needed permit revisions to accommodate electronic reporting. In addition, it will provide time for facilities to work with the EPA to conduct beta testing of CEDRI forms in advance of initial reporting.



Reporting and Recordkeeping Requirements for the New Source Performance Standards (*i.e.*, the NSPS electronic reporting rule) (80 FR 15100), electronic reporting results in an overall cost savings to industry when annualized over a 20-year period, although there are some initial costs in the short term (80 FR 15111). The cost savings is achieved through means such as standardization of data, embedded QA checks, automatic calculation routines, and reduced data entry through the ability to reuse data in files instead of starting from scratch with each report. As outlined in the NSPS electronic reporting rule, there are many benefits to electronic reporting. These benefits span all users of the data – the EPA, state and local regulators, the regulated entities, and the public. In the preamble to this proposed rule (81 FR 97079-80), we provided a number of reasons why the electronic reporting required by the amendments will provide benefits going forward and that most of the benefits we outlined were longer-term benefits (*e.g.*, eliminating “paper-based, manual processes, thereby saving time and resources, simplifying data entry, eliminating redundancies, minimizing data reporting errors and providing data quickly and accurately to the affected facilities, air agencies, the EPA and the public.”).

We agree that it is unreasonable to put sources at risk of violations because of EPA reporting tool issues or availability. Based on commenter input and our consideration of the tasks that delegated authorities and facilities must conduct prior to initial compliance, we have determined a year from the posting of the report template on the CEDRI website will provide for a more efficient transition to electronic reporting of semiannual reports. For these reports, the initial compliance date for electronic reporting will be once the form has been available in CEDRI for 1 year. We have also added language to the final rule to provide facilities with the ability to seek electronic reporting extensions for circumstances beyond the control of the facility, *i.e.*, for a possible outage in the CDX or CEDRI or for a force majeure event in the time just prior to a report’s due date. If either the CDX or CEDRI is unavailable at any time beginning 5 business days prior to the date that the submission is due, and the unavailability prevents facilities from submitting a report by the required date, facilities may assert a claim of EPA system outage. We consider 5 business days prior to the reporting deadline to be an appropriate timeframe because if the system is down prior to this time, facilities still have 1 week to complete reporting once the system is back online. However, if the CDX or CEDRI is down during the week a report is due, we realize that this could greatly impact a facility’s ability to submit a required report on time. We will notify reporters about known outages as far in advance as possible by the EPA’s Clearinghouse for Inventories and Emissions Factors (CHIEF) Listserv notice, posting on the CEDRI Web site and posting on the CDX Web site so that users can plan accordingly and still meet the reporting deadline. However, if a planned or unplanned outage occurs and a reporter believes that it will affect or it has affected their ability to comply with an electronic reporting requirement, we have provided a process to assert such a claim. A force majeure event is an event that will be or has been caused by circumstances beyond the control of the affected facility, its contractors, or any entity controlled by the affected facility that prevents you from complying with the requirement to submit a report electronically as required by this rule. Examples of such events are acts of nature, acts of war or terrorism, or equipment failure or safety hazards beyond the control of the facility. If such an event occurs or is still occurring or if there are still lingering effects of the event in the 5 business days prior to a submission deadline, we have provided a process to assert a claim of force majeure. In both circumstances, reporting should occur as soon as possible once the situation has been resolved. We are providing these potential extensions to protect you from noncompliance in cases where you cannot successfully submit a report by the reporting deadline for reasons outside of your control as described above.

We are not providing an extension for other instances. Facilities should register for CEDRI far in advance of the initial compliance date, in order to make sure that they can complete the identity proofing process prior to the initial compliance date. Additionally, we recommend that facilities start developing reports early, in case any questions arise during the reporting process.

While we do agree that more time is necessary to comply with electronic reporting requirements for semiannual reports, we do not agree that more time is necessary to comply with electronic reporting requirements for performance test reports and performance evaluation reports, which are uploads of ERT files. The allotted 60 days should be ample time to determine whether these reports need to be uploaded to CEDRI. We also do not agree that more than 60 days is needed to obtain access to the EPA's CDX. Even certifiers who choose to use the paper Electronic Signature Agreement process for registration (which takes longer than the LexisNexis verification) only need approximately 2 weeks in order to finish the identity-proofing process. Preparers do not need to go through an identity-proofing process and may register with CDX at any time. Additionally, while the CEDRI forms for periodic reports are new, stack testers have been using the ERT for many years, so many stack testers are already familiar with how to input test data into the ERT. Once a report is created in the ERT, the only additional steps that are necessary are to upload the ERT package and then for the certifier to submit it electronically. This can be performed in one step if the certifier chooses to upload the report. Reports generated by the ERT can also be printed out to be submitted to air agencies, should the air agency require a hardcopy report.

We disagree that the ERT continues to be revised and updated due to various flaws. We acknowledge that in early versions of the ERT, there were some issues, particularly related to rounding results. However, we have diligently worked to address issues as they have been brought to our attention. We have also added many improvements to the ERT based on feedback from users. While we acknowledge that in 2016 we updated the ERT approximately once a month on average, these updates were either intended to enhance the user's experience based on user feedback and requests or to add seven new test methods to the ERT.

CEDRI provides as many as three format options to submit a given periodic report; these include: extensible markup language (XML) schema, spreadsheet template, and fillable web form. In the case of the Boiler MACT Compliance Report, CEDRI provides all three options, and the affected facility need only use one of the options to submit a Compliance Report. The web form for the Boiler MACT did have some changes based on feedback from the affected facilities, but these changes affected only the web form and did not impact the other report format options, XML schema, or spreadsheet template. If the affected facility uses the spreadsheet template option, the facility-level information and the completed spreadsheet template, which includes the applicable reporting requirements, are uploaded into CEDRI to complete the semiannual compliance report.

In order to prevent the issues that were encountered with the Boiler MACT forms, we included a copy of the draft subpart MM Excess Emissions Reporting Spreadsheet Template in the docket of the proposed rule, enabling industry to begin the process of assessing the form well in advance of the compliance date and providing the public a chance to comment on the format and content of the template. Additionally, as discussed above, we are extending the compliance date for electronic reporting of semiannual excess emissions reports. We encourage users to

become familiar with the system prior to being required to use it. Once a template is available on the CEDRI website, users will have the ability to use the system to start creating reports. All users will have 1 year to become familiar with the system prior to the compliance date for submitting reports electronically. This should provide adequate time for facilities to adjust to electronic reporting, as well as assure that the forms will work properly, prior to the date that owners and operators must start submitting these reports electronically. For previous electronic reporting rulemakings, prior to a compliance reporting deadline, we have provided webinars to our various stakeholders on the access and reporting of the given report in CEDRI. We will be available to provide this same service to the facilities subject to the subpart MM electronic reporting requirements.

We disagree that we should remove the requirements for electronic reporting in this rule until a new universal system for electronic reporting is developed. We have worked and will continue to work with air agencies on the development of our electronic reporting tools. Our electronic reporting program is part of the E-Enterprise for the Environment initiative, a collaborative effort between the EPA and air agencies through the Environmental Council of the States (ECOS). As part of the E-Enterprise program, the EPA is developing a scoping study on data integration for its different reporting systems. Additionally, as documented in the “Compliance and Emissions Data Reporting Interface Integrated Project Team Guidance and Recommendations Document,” September 26, 2013, Docket Item No. EPA-HQ-OAR-2009-0174-0059, we convened an Integrated Project Team (IPT) to gather ideas from air agencies on the data flow process within CEDRI, including data submission, data resubmission, and data access requirements of the CEDRI data flow.

A number of air agencies have already indicated their intention of adopting the EPA’s electronic reporting program. The EPA predicts that more air agencies will eventually adopt the system, as the system benefits air agencies by streamlining review of data, facilitating large-scale data analysis, providing accessibility to reports anywhere reviewers have access to the Internet, and providing cost savings through a reduction in storage costs. The narrative and upload fields within the CEDRI forms can be used to provide information to satisfy extra reporting requirements that states and local air agencies may impose. Additionally, where air agencies will not accept an electronic report, reports in CEDRI can be printed once they are completed; these printed reports provide a cost-effective option for satisfying a state or local air agency’s request for a printed report.

We routinely discuss electronic reporting with air agencies and the EPA Regional offices. We have monthly calls with the EPA Regional offices in order to provide information that will be helpful in their outreach efforts to the air agencies in their Regions. We have performed demonstrations of the CEDRI reporting program and the ERT for EPA Regional offices and their associated air agencies, as well as for air agency groups like the Mid-Atlantic Regional Air Management Association (MARAMA).

Additionally, through the E-Enterprise’s Combined Air Emissions Reporting (CAER) project, we are working with air agencies to streamline multiple emissions reporting processes. Currently, air emissions information is collected by the EPA and air agencies through numerous separate regulations, in a variety of formats, according to different reporting schedules, and using multiple routes of data transfer. The CAER project seeks to reduce the cost to industry and

government for providing and managing important environmental data. More information on CAER can be found at: <https://www.epa.gov/e-enterprise/e-enterprise-combined-air-emissions-reporting-caer>. Through the CAER project, we are also providing CEDRI outreach to all participants, including air agencies. The CAER project also currently supports user input forums that allow CEDRI users to review and comment on enhancements to e-reporting options during the developmental phase.

We acknowledge the commenter's support for the use of the spreadsheet-style form for fulfilling reporting requirements. We intend to solely use the spreadsheet-style form for this rule in lieu of a fillable web form or XML. We have revised the draft subpart MM Excess Emissions Reporting Spreadsheet Template provided at proposal based on public comments and to include formatting changes to facilitate extraction of the summary report data into the EPA's data base. The revised version of the spreadsheet and an accompanying summary memorandum are provided in the docket.<sup>139</sup> The subpart MM excess emissions reporting spreadsheet template was designed to encompass the summary and detailed reports required to be submitted semiannually. The summary report content will be required to be submitted in the spreadsheet template format. We are not allowing free-form excess emissions summary reports because this does not allow for efficient electronic compilation of the information reported, a key benefit of electronic reporting. In some cases, the number of opacity or parameter limit exceedances or amount of monitoring down time may trigger detailed reports. For the final rule, in addition to submitting the required excess emissions summary report worksheets of the spreadsheet template, facilities are given the choice to use the detailed reporting worksheets in the subpart MM semiannual reporting spreadsheet (*i.e.*, the orange worksheets) or to supply the detailed data in an alternative format generated by their DAS. The alternatively-formatted detailed report would be uploaded into CEDRI (*e.g.*, as a pdf, Word, or Excel file) along with the semiannual summary report spreadsheet to provide all of the information required in the semiannual report to delegated authorities for their review. The EPA is allowing upload of a separate file in an alternative format for detailed reports to reduce burden on reporters given the potential length of such reports.

As proposed, an electronic copy of all notifications required under subpart MM would have been required to be uploaded into CEDRI. Subpart MM requires numerous notifications listed in the NESHAP General Provisions (40 CFR part 63, subpart A), as specified in Table 1 of subpart MM. For example, facilities are required to notify their delegated authority prior to conducting or rescheduling performance tests, as well as in the event of a CMS performance evaluation. In light of the comments received expressing concern about the perceived burden of electronic reporting, we decided to narrow the list of notifications required to be uploaded into CEDRI for subpart MM to certain key (non-routine) notifications that will be the most informative in conjunction with electronically submitted emissions test reports and semiannual reports. We reduced the types of notifications to be uploaded to the initial notification required in §63.9(b), the notification of compliance status required in §63.9(h), and the report of PM emission limits required in §63.867(b) to be included as part of the notification of compliance status. Initial notifications and notifications of compliance status are required as new facilities or new process units are installed, and therefore, are infrequent for subpart MM. Any of these

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<sup>139</sup> U.S. EPA. *Electronic Reporting for Subpart MM Excess Emission Reports - Final Rule*. Memorandum to EPA-HQ-OAR-2014-0741.

notifications required 2 years after the effective date of the final amendments would be required to be uploaded into CEDRI because no specific form is being designed and tested for subpart MM notifications.

We have determined that the electronic submittal of the reports addressed in this rulemaking increases the usefulness of the data contained in those reports, is in keeping with current trends in data availability, further assists in the protection of public health and the environment and will ultimately result in less burden on the regulated community. Additionally, we note that in 2011, in response to EO 13563, the EPA developed a plan<sup>140</sup> to periodically review its regulations to determine if they should be modified, streamlined, expanded, or repealed in an effort to make regulations more effective and less burdensome. The plan includes replacing outdated paper reporting with electronic reporting. In keeping with this plan and the White House's Digital Government Strategy<sup>141</sup>, in 2013 the EPA issued an agency-wide policy specifying that new regulations will require reports to be electronic to the maximum extent possible. By requiring electronic submission of reports in this rule, we are taking steps to implement this policy. Therefore, we are retaining the requirement to report these data electronically.

**6.3-02 Comment:** Commenter 0173 supported the EPA's proposed updates to the electronic reporting requirement in the standards to enhance compliance and enforcement. The commenter stated that the updates are well-supported and legally required as part of meeting the EPA's statutory obligations, and the EPA must finalize the updates it has proposed.

Commenter 0173 stated that the EPA also must require that facilities make available online all information that they must keep records on and report to the EPA or a state permitting agency. According to the commenter, requiring direct on-line public reporting of the compliance information under the rules would increase transparency, assist community members, states, and local governments in evaluating the compliance and safety threats from pulp mills, and deter violations. The commenter stated that the ability to keep electronic records and to report data electronically to the EPA illustrates that sources can and should directly report this same information to the public, either through creating their own online method of displaying the same information they keep and report, or through the EPA releasing such information online in an easily accessible format for public review and use. The commenter asserted that electronic recordkeeping and reporting are developments that the EPA must account for and address under section 112(d)(6) through requiring public online reporting in this rulemaking.

**Response:** We acknowledge the commenter's support for the proposed electronic reporting. The electronic reports will be submitted to the EPA via the CDX and will be available to the public via the EPA's WebFIRE database at <https://cfpub.epa.gov/webfire/reports/esearch.cfm>.

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<sup>140</sup> U.S. EPA. *Final Plan for Periodic Retrospective Reviews of Existing Regulations*, August 2011. Available at: [https://www.epa.gov/sites/production/files/2015-09/documents/eparetroreviewplan-aug2011\\_0.pdf](https://www.epa.gov/sites/production/files/2015-09/documents/eparetroreviewplan-aug2011_0.pdf).

<sup>141</sup> U.S. White House. *Digital Government: Building a 21<sup>st</sup> Century Platform to Better Serve the American People*, May 2012. Available at: <https://www.whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government-strategy.pdf>.

## 6.4 Electronic Reporting Spreadsheet Template

**6.4-01 Comment:** Based on their review of the semiannual compliance reporting template spreadsheet for subpart MM, commenter 0168 stated that:

- §63.867(c)(1) requires that: “When no exceedances of parameters have occurred, the owner or operator must submit the summary report stating that no excess emissions occurred during the reporting period.” There is no place in the Summary Report templates to include this statement.
- 40 CFR 63.10(e)(3)(v) requires that “When no excess emissions or exceedances of a parameter have occurred, or a CMS has not been inoperative, out of control, repaired, or adjusted, such information shall be stated in the report.” If this requirement applies to the subpart MM summary reports (subject of a prior comment), there is no place in the Summary Report templates to include the statement.

**Response:** The final rule now refers to 40 CFR 63.10(e)(3)(v) of the General Provisions. The E-reporting spreadsheet template *COMS* and *CPMS tabs* were revised to include rows where an “X” can be used to indicate:

- If no excess emissions or exceedances of a parameter have occurred during the reporting period, or
- If the CMS has not been inoperative, out of control, repaired, or adjusted during the reporting period.

**6.4-02 Comment:** Referring to the reporting template spreadsheet, commenter 0168 stated that it appears the EPA’s intention is that all 6-minute average opacities exceeding 20 percent be reported as excess emissions on the *COMS tab*. However, the rule does not define opacities exceeding 20 percent as excess emissions until they exceed 2 percent of the operating time during the reporting period for recovery furnaces and 1 percent of the operating time for lime kilns. [§63.864(k)(1) and (2)]

**Response:** All 6-minute opacity averages above the applicable opacity limit (during times when spent pulping liquor or lime mud is fed) are considered to be monitoring exceedances (*i.e.*, excess emissions) but do not constitute a “violation” until they exceed the applicable monitoring allowance. The monitoring allowance is a percent of operating time in excess of the opacity limit. The opacity limits and monitoring allowances for ESP-controlled process units are as follows:

- 35 percent opacity with a 2 percent monitoring allowance for existing kraft and soda recovery furnaces;
- 20 percent opacity with a 2 percent monitoring allowance for new kraft and soda recovery furnaces; and
- 20 percent opacity with a 3 percent monitoring allowance for new and existing lime kilns.

Facilities must first record all excess emissions in order to have the information needed to determine when the detailed excess emissions report is triggered. There are two separate opacity triggers for completion of the detailed excess emissions report:

- If excess emissions equal or exceed 1 percent of operating time, or

- If an opacity “violation” is triggered because opacity exceeds the applicable monitoring allowance.

**6.4-03 Comment:** Referring to the reporting template spreadsheet, commenter 0168 stated that §63.864(d)(4) specifies that each 6-minute COMS data average be calculated as the average of 36 or more data points, equally spaced over each 6-minute period. As such, when a COMS undergoes a calibration, which is required at least once per day, there will be at least one 6-minute data average that is not valid due to the calibration. The rule should clarify whether invalid 6-minute averages caused by required calibrations are considered CMS downtime. This comment applies to the detailed COMS downtime report as well as the summary report.

**Response:** As specified in §63.867(c)(1)(viii), the CMS performance summary includes the duration of downtime broken down by several groupings, including QA/QC calibrations. Invalid data averages due to calibrations are considered to be CMS downtime and would be reported on the “Quality assurance/quality control calibration” row of the *COMS tab* in the reporting template spreadsheet. Facilities are provided a CMS downtime allowance of 5 percent of total source operating time before CMS downtime triggers detailed CMS performance reporting. We reviewed the COMS data in the docket for this rulemaking to gain a better understanding of how the calibration frequency compares with the 5 percent CMS downtime trigger. We found that most COMS for which calibrations were reported had calibrations rendering one or two 6-minute averages per day invalid which corresponds with 1 to 2 percent of operating time. In the most extreme case where calibrations were reported, one unit (recovery furnace 105.EU445C) indicated calibrations affecting ten 6-minute averages per day (*e.g.*, 4.2 percent of operating time).

Triggering detailed CMS performance reporting does not mean a violation has occurred; rather, it means that there was enough CMS downtime that the delegated authority would be provided additional information to understand whether there is a CMS performance problem. Also, although considered CMS downtime, invalid averages due to COMS calibration are not considered as excess emissions. Section 63.864(h) excludes monitoring data recorded during periods of unavoidable CMS breakdowns, out-of-control periods, repairs, maintenance periods, calibration checks, and zero (low-level) and high level adjustments from data averages.

**6.4-04 Comment:** Referring to the COMS and CPMS Summary Report templates (green *COMS* and *CPMS tabs*), commenter 0168 stated that:

- These tabs include the count of the number of averages for which there was CMS downtime. The proposed rule does not require this information to be reported on either the Summary Report or detailed report; it requires only that the duration of CMS downtime be reported.
- These tabs include the count of the number averages that exceed the parameter limit. However, the rule does not require that information to be included in the Summary Report under §63.867(c)(1). The rule requires the count of the number of opacity exceedances, scrubber exceedances, and RTO exceedances to be included in the detailed report (Continuous Emissions and Monitoring System Performance Report) under §63.867(c)(3).
  - Count of # of opacity exceedances is in §63.867(c)(3)(iii)(A)(3)

- Count of # of scrubber exceedances is in §63.867(c)(3)(iii)(C)(2)
- Count of # of RTO temperature exceedances §63.867(c)(3)(iii)(D)(2)
- The rule should allow the count of exceedances to be included either on the Summary Report or in the detail report.

Referring to the *Excess Emissions Detail tab*, commenter 0168 stated that:

- The template includes the duration of excess emissions; however, the rule language requires that the count of the number of periods of excess emissions be reported. (This information is included on the Summary Report templates.)
  - Count of # of opacity exceedances is in §63.867(c)(3)(iii)(A)(3)
  - Count of # of scrubber exceedances is in §63.867(c)(3)(iii)(C)(2)
  - Count of # of RTO temperature exceedances §63.867(c)(3)(iii)(D)(2)

**Response:** The summary reports are divided into two sections: the emission data summary in upper half of the table, and the CMS performance summary in the lower half of the table. We reviewed examples of periodic reports submitted by different companies prior to developing the spreadsheet reporting template and noted that some, but not all, companies already include a count of averaging periods in their summary reports for the emissions data summary and the CMS performance summary.

*Emissions data summary.* For the final rule, we added language to §63.867(c)(1)(vii) to require the number (count) of averaging periods that reflect monitoring exceedances, also referred to as excess emissions, in the emissions data portion (upper half) of summary report to resolve the issue noted by commenters. We proposed to include the count of opacity 6-minute averages and CPMS averaging periods that represent monitoring exceedances in the summary report because this information is needed to determine when more detailed excess emissions reporting is required. The triggers for detailed excess emissions reporting are:

- if excess emissions equal or exceed 1 percent of operating time, or
- if a violation according to §63.864(k)(2) occurred (*e.g.*, because the applicable opacity monitoring allowance is exceeded, because six or more 3-hour parameter averages are below their minimum limits, or because any RTO temperature average is below the minimum limit).

Counting averaging periods reflecting excess emissions is necessary to determine whether a violation under §63.864(k)(2) occurred. In addition, §63.867(k)(3) requires counting of averaging periods that represent monitoring exceedances because only one exceedance will be attributed in any given 24-hour period as discussed in response to comment 5.2-04. For opacity, counting of averaging periods is also required under the applicable kraft pulp mill NSPS (40 CFR 60 subparts BB or BBa). Section 63.867(c)(3) requires submittal of the summary report along with the detailed excess emissions reports when detailed reporting is triggered. Inclusion of the count of averaging periods that represent excess emissions in the summary report satisfies the requirement to include the number of monitoring exceedances in the detail report. Thus, we maintain that it is appropriate to include the count column in the emissions data portion of summary report for purposes of determining whether a violation has occurred.



*CMS performance summary.* The contents of the CMS performance summary were based on 40 CFR 63.10(e)(3)(vi)(J) of the General provisions which was proposed to be replaced by §63.867(c)(1)(viii) in subpart MM. In response to this comment, we edited the replacement language in §63.867(c)(1)(viii) to more closely reflect the exact wording of 40 CFR 63.10(e)(3)(vi)(J). The commenters are correct in that reporting the number (count) of averaging periods for which there was CMS downtime is not required. Therefore, we removed the count column from the CMS performance summary portion of the summary report in the spreadsheet reporting template.

*Changes to excess emissions reporting template tab structure.* The EPA made structural changes to the spreadsheet reporting template following proposal to facilitate data extraction and address comments. First, the proposed *certification tab* was removed because the certification process within CEDRI satisfies the semiannual report certification requirement in §63.867(c)(1)(x). Second, formulas were added to the *Unit\_Info tab* to indicate when the green *COMS* and *CPMS tabs* should appear. The *COMS* and *CPMS tabs* were pre-numbered in sequence as *COMS1*, *COMS2*.... and *CPMS1*, *CPMS2*.... etc. to correspond with a given unit ID facilitate data extraction into the EPA's data base and to reduce burden by pre-population of data within each *COMS* and *CPMS tab*. When users select "yes" in *Unit\_Info tab* columns M-N to indicate they need a *COMS* or *CPMS tab*, that tab appears. A memorandum titled, *Electronic Reporting for Subpart MM Excess Emission Reports - Final Rule*, provides an overview of the revised excess emissions reporting template.

**6.4-05 Comment:** Referring to the reporting template spreadsheet, commenter 0168 stated that the rule does not include alternative monitoring parameters in the list of information required to be reported under §63.867(c)(3)(iii).

**Response:** We reviewed the alternative monitoring parameter language in subpart MM and are making some changes as a result of this comment.

Sections 63.864(e)(13) and (14) of subpart MM contain provisions stating that facilities may monitor alternative parameters upon approval from the Administrator. Sections 63.864(e)(13) and (14) do not specify a particular averaging period for alternative parameters, but §§63.864(k)(1)(vi) and (vii) and (2)(viii) through (ix) base corrective action requirements and violations on a 3-hour average consistent with how wet scrubber operating parameters are assessed. The §63.866 recordkeeping requirements and the §63.867(c)(1) summary reporting requirements apply to the alternative parameters because these sections refer to operating parameter limits in general. Therefore, we proposed to include reporting of 3-hour average alternative parameters in the *CPMS tab* of the spreadsheet reporting template. For the final rule, we are finalizing the 3-hour average alternative parameters in the *CPMS tab* and adding §63.867(c)(3)(iii)(E) to require reporting of alternative parameters. These changes are consistent with the intent of the proposal.

We also considered the monitoring requirements in §63.864(e)(13) and (14) as a result of this comment. For the final rule, we did not finalize the proposed phrase "the site-specific monitoring plan described in paragraph (a) of this section," because the phrase referred to paragraph (a), which was previously reserved. Also, we note that facilities requesting approval of alternative monitoring parameters from the Administrator may develop site-specific monitoring,

recordkeeping, and recordkeeping approaches associated with alternative parameters that do not fit within the spreadsheet template format (*e.g.*, if an alternative parameter is not addressed in the spreadsheet or has an averaging time other than 3-hours). In situations where the spreadsheet template does not apply for a given alternative monitoring approach, facilities must submit their report to the Administrator at the appropriate address listed in 40 CFR 63.13, as indicated in §63.867(d)(2).

**6.4-06 Comment:** Commenter 0168 stated that the template includes a column to indicate where data was excluded, and the example data shows use of this column in the reporting of opacity excess emissions during a period when there was no liquor firing. Because the opacity parameter limitations apply only when BLS or lime mud is fired, the example is for a non-reportable situation and is therefore confusing (*i.e.*, there cannot be excess emissions during times that liquor or lime mud are not fed). It would seem that an indication of where data was excluded is covered by the monitor downtime templates and is not necessary on the excess emissions templates.

**Response:** The commenter is correct that the operating parameter limits only apply when spent pulping liquor or lime mud is being fed to the process unit. Excess emissions are not expected when spent pulping liquor or lime mud are not being fed. However, some facilities are likely to continue to monitor during these times and may prefer to provide data for all monitoring events rather than removing selected times from the data provided. Therefore, we provided a column for labeling data to be excluded from data averages. Facilities may choose whether to provide data during times when spent pulping liquor or lime mud is not being fed to the process unit. The default blank value in the “excluded data” column is to include the data. There is no additional burden if the “excluded data” labeling option goes unused.

Also, as noted elsewhere, facilities may provide detailed reporting data using the orange spreadsheet template tabs or in an alternative format (*e.g.*, data generated by the DAS as a separate file uploaded into CEDRI in portable document format (PDF)) as long as the alternative format includes the information required in §63.867(c)(3). Facilities are required complete the gray and green summary report tabs for each semiannual excess emissions report regardless of how the detailed report information is submitted (if detailed reporting is triggered at all).

**6.4-07 Comment:** Commenter 0168 stated that, like the comments on the Summary Report templates, it does not make sense to report short-term duration excess emissions for the ESP semiannual average parameters since there is a single data average per reporting period.

The commenter noted that proposed §63.867(c)(3)(iii)(B)(3) requires of “the operating parameters averaged over the semiannual reporting period.” Assuming this means that the semiannual average of each monitored ESP parameter must be report, there is no place on the template to report this information.

The commenter stated that the example that the EPA provides for ESP semiannual reporting is confusing. A deviation period would be the full semiannual period. There would be no reportable short duration events.

**Response:** The semiannual average *ESP reporting tab*, which was included in the version of the spreadsheet template at proposal, was removed from the spreadsheet template for the final rule. As explained elsewhere, we are not finalizing the proposed semiannual average ESP reporting and are instead finalizing an ongoing requirement to maintain proper operation of the ESP AVC.

**6.4-08 Comment:** Referring to the *CPMS (LK)* example in the reporting template spreadsheet, commenter 0168 stated that it appears that the count of deviations for scrubber pressure drop and scrubber flow are separate events. Thus, a count of 4 for scrubber flow and a count of 2 for scrubber dP, from the same control device, would not be a violation. The rule language in §63.864 states “six or more 3-hour average scrubber parameter values within any 6-month reporting period are outside the range of values established.” The rule language should clarify how deviations for failure determination are counted.

Commenters 0168 and 0169 stated that in the *CPMS (LK)* and *(SDTI) tabs*, examples for the duration of events and the count of event examples are not consistent. It would help facilities if the duration and count were consistent. The EPA should also identify in the examples if 3-hour rolling averages or 3-hour block averages are being used for the count. The EPA should also evaluate how impactful the removal of one violation per 24-hour period language is for sources using a 3-hour rolling average.

**Response:** The “six or more 3-hour average” language that we are finalizing in §63.684(k)(2) is similar to language included in the original rule and applies to each operating limit for control devices with multiple parameter limits. For example, a wet scrubber with liquid flow rate and pressure drop operating limits could incur five liquid flow rate averages plus five pressure drop averages below the minimum operating limit during normal operations without incurring a violation during the semiannual period. Each parameter monitored gets five averages that are monitoring exceedances before a violation is incurred. A violation is considered to have occurred upon the sixth (or greater) averaging period reflecting a monitoring exceedance. As explained in response to comment 5.2-04, we have not finalized any change in §63.864(k)(3), so that only one monitoring exceedance would be incurred in a 24-hour period as opposed to multiple 3-hour violations occurring as part of the same event. A note was added to the *CPMS tab* of the excess emissions reporting spreadsheet to indicate that facilities are to record the entire duration of monitoring exceedances but only count averages in separate 24-hour periods. It was also noted in the *CPMS tab* that it is possible that the duration hours reported may exceed the hours associated with the count of averaging periods due to the provision in §63.864(k)(3).

Examples based on 3-hour block averages were included in the *CPMS tab* of the reporting spreadsheet template provided at proposal. The examples included situations where the exact duration and count were not consistent to reflect the situation where a monitoring exceedance begins and ends at some point within differing 3-hour periods. The partial 3-hour period in which the event begins or ends may not result in a monitoring exceedance due to averaging of the recorded readings. The duration column in the *CPMS tab* is unaffected by the block or rolling averaging time approach used by facilities. The count column can accommodate either the number of 3-hour block or the number of 3-hour rolling averages recorded as excess emissions.

As originally promulgated, neither subpart MM nor the General Provisions were specific regarding whether the 3-hour averaging time was to be calculated on a block or rolling basis. Therefore, commenters have pointed out that some facilities currently use block averaging periods while others use rolling averaging periods. Both calculation approaches (block or rolling) are acceptable. For 3-hour rolling averages, there would be 24 averages available per day to use for assessing compliance. For 3-hour block averages, there would be 8 per day. Keeping the original §63.864(k)(3) provision that only one monitoring exceedance would be incurred in a 24-hour period helps to equalize the inequity between facilities using a rolling average versus a block average. We did not propose to specify whether a block or rolling calculation approach is required because we were not aware of this discrepancy at the time of proposal. Similarly, we are not specifying a block or rolling averaging approach for the final rule because of the burden that would be associated with reprogramming existing data collection systems.

**6.4-09 Comment:** Referring to the *Unit Info tab* of reporting template spreadsheet, commenter 0168 suggested that for semichemical combustion units, the EPA should add new column “J” titled ‘Does the Process Unit use an Administrator-approved air pollution control system other than an ESP, wet scrubber, RTO, or fabric filter per §63.864(e)(14)?’

**Response:** The suggested column was added to the *Unit Info tab*. Also, facilities using a control device type other than the default choices listed in the “APCD Type” column would select “Other: {specify}” from the menu and overwrite the word “{specify}” with the control device type (*e.g.*, the user would enter “Other: Absorber/Fabric Filter”). See the updated memorandum titled *Electronic Reporting for Subpart MM Excess Emission Reports – Final Rule* in the docket for more details on additional updates to the reporting spreadsheet templates.

**6.4-10 Comment:** Commenters 0168 and 0169 stated that in the *CMS detail tab* (RF1-EP1) of the reporting template spreadsheet, column G should be labeled to require the “cause of the event.” The event cause may not be a “malfunction.” For example, a daily calibration is not a malfunction. The column label should include both cause and malfunction cause. The commenter would also suggest moving the “Type of CMS inoperative or out of control period” column of information after the cause and corrective action columns. Event groups are determined after the cause and corrective action are identified.

**Response:** Column G of the *CMS detail tab* was relabeled “cause of the event” and the order of the columns was adjusted as suggested by the commenter. Column G was proposed to be labeled “nature and cause of malfunction” because this wording corresponded with the recordkeeping language from 40 CFR 63.10(c)(10) that is required to be reported according to 40 CFR 63.10(e)(3)(v) and in proposed §63.867(c)(3)(iv) of subpart MM. For the final rule, we are finalizing §63.867(c)(3)(iv) to state “The nature and cause of the event (if known)” to reflect that CMS downtime may be caused by an event other than a malfunction.

**6.4-11 Comment:** Referring to the *EE Detail tab* (RF1-EP1 and LK Scbr Flow), commenters 0168 and 0169 stated that:

- Column E should be labeled as the breakdown of the event or type of EE period. The breakdown of events is not a reason or a cause.

- In column F, the word “malfunction” should not be used. Column F should be labeled as the “Cause of the Exceedance.” If the EPA wants an affirmative indication that an event meets the definition for a malfunction, an additional column should be added to check-mark the event row.
- The column requiring excluded data reporting is unclear. It is unclear in the recordkeeping and reporting language that these events are “reportable” because they are exempt due to startup and shutdown exclusions and would also be exempt from “corrective actions” and the “count of deviations.”
- The breakdown of events, column E, needs to use the words “startup/shutdown, control equipment problems, process problems, other known causes, and other unknown causes” for consistency with subpart A. Data acquisition systems have already been programmed with the wording from the General Provisions.
- The commenter also suggests moving the “breakdown of event” column E to after the cause and corrective action columns. Event groups are determined after the cause and corrective action are identified.
- For each individual control equipment device, facilities should have the flexibility to include all parameters, for example wet scrubber flow and pressure drop, events within the same EE tab. Separate EE tabs should not be required for each individual parameter. The EE and CMS tabs should include a “Trouble” or “Parameter” identification column so that reporting can be streamlined. A spreadsheet with numerous tabs becomes extremely cumbersome for data entry and review.

**Response:** As suggested by the commenters, column E was relabeled “Type of exceedance,” shifted to come after the cause and corrective action columns, and includes the following menu choices from the General Provisions: startup/shutdown, control equipment problems, process problems, other known causes, and other unknown causes. Corresponding wording changes were made to §§63.867(c)(iii)(A)(5), (B)(5), (C)(3), and (D)(3).

Column F was relabeled “cause of the exceedance” and a corresponding wording revision was made to §63.867(c)(3)(iv) as described in the previous response.

The excluded data column may be useful for facilities that report information from a range of operating periods recorded by their DAS, including periods that are excluded from data averages, such as:

- Monitoring data recorded during periods of unavoidable CMS breakdowns, out-of-control periods, repairs, maintenance periods, calibration checks, and zero (low-level) and high level adjustments [§63.864(h)]
- Monitoring data recorded during periods when spent liquor solids (for recovery furnaces) or lime mud (for kilns) is not fed. [§63.864(k)(1), (k)(2)]

For example, facilities are not required to report data recorded during times when spent pulping liquor or lime mud is not fed, but for facilities that choose to do so, the excluded data column provides a place for facilities to flag data that are to be excluded from data averages. Facilities that choose not to report excluded data may leave the excluded data column blank.

We are not able to accommodate the request to include multiple parameters on one *EE Detail tab* because of how the tabs are set up to calculate the total duration of excess emissions for a single parameter. Including a single parameter in each tab makes it easier for the delegated authority to review the data and evaluate potential violations, and also allows for a consistent format to be extracted into a data base for future analysis. However, as stated in response to comment 6.3-01, facilities are allowed to substitute a report in separate file (*e.g.*, a pdf of a printout from their DAS) that contains all of the required components of the excess emissions detail report instead of completing the *EE Detail tab* of the spreadsheet. The facility's alternate format may intermingle multiple scrubber parameters if that is how the data are reported so long as all of the required components of the excess emissions detail report are included in the facility's submission.

**6.4-12 Comment:** Referring to the reporting template spreadsheet, commenter 0169 stated that in the *Failures tabs*, it is unclear which deviation events to include. If a facility goes over the 6th event or the % criteria, it is unclear if the EPA is requiring emissions estimates of all events or only those events that caused a source to be over the failure threshold. Not all excess opacity events are expected to be over the PM threshold.

**Response:** Applicable standards include emission limits and operating limits. In the case of an applicable standard that has multiple criteria to exceed it (both magnitude and a count or duration), a facility has not failed to meet the applicable standard until all the criteria are met; it is the aggregate of the individual occurrences that are the definition of failure. Therefore, it is necessary to record all of the individual events leading up to the failure determination as well as all those occurring after. For example, upon the sixth 3-hour average exceeding a particular scrubber parameter value the requirement to report failures occurs, all 3-hour averages not meeting the standard must be recorded on the *Failures tab*, including the first five 3-hour averages, as these together define the failure. We added instructions to the reporting spreadsheet reporting template to clarify that reporting of all averaging periods where operating limits are violated is required, including the initial averages before a violation is triggered.

As described in response to comment 6.1-01, we also updated the version of the *Failures tab* presented at proposal to be consistent with clarifying revisions to the proposed §63.866(d)(2) and §63.867(c)(4) the EPA is making for the final rule. The EPA proposed reporting of failures to meet an applicable standard including any emission limit in §63.862 (for PM, methanol, or THC), or opacity and CPMS operating limits required in §63.864. The EPA also proposed that the date, time, duration, and associated emission sources must be reported for each failure of emission limits in §63.862 or operating limits in §63.864. In addition, for failures to meet emission limits under §63.862, the EPA proposed reporting an estimate of the quantity of each regulated pollutant emitted over any emission limit and a description of the method used to estimate the emissions must be reported. For the final rule, the *Failures tab* reflects that this emissions estimate is only required to be included in the semiannual report for failures to meet an emission limit, and not failures to meet operating limits.

Although the final rule does not require semiannual reporting of an emissions estimate associated with failure to meet an opacity or CPMS operating limit, §63.866(d)(2) does require facilities to maintain sufficient information to provide an emissions estimate (*e.g.*, based on engineering judgment) if requested by the Administrator.

We also revised the version of the *Failures tab* presented at proposal so that it is consistent with the revisions to the proposed §63.866(d)(2) and §63.867(c)(4) the EPA is making for the final rule. Failures of emission limits are likely to be discovered during repeat stack tests, which provide a quantitative means for estimating emissions. Failures also include violations of opacity and parameter operating limits as specified in §63.864(k)(2), which are required to be reported with the corresponding number of failures, and the date, time, and duration of each failure in the semiannual report. The final rule does not require reporting of an emissions estimate associated with failure to meet an opacity or parameter operating limit, but does require facilities to maintain sufficient information to provide an emissions estimate if requested by the Administrator.

## 7. Compliance Dates

**7-01 Comment:** Multiple commenters (0164, 0168, 0169, 0171) contended that, if the EPA retains the current changes to the opacity provisions, 1 year is not sufficient compliance time. The commenters noted that the EPA's cost and impacts analysis indicates that some facilities will need ESP upgrades to comply with the lower opacity operating limit. The commenters stated that these facilities will need more than 1 year to engineer and implement these improvements. Depending on the site-specific considerations (*e.g.*, space constraints), the commenters indicated ESP modifications could require up to 3 years to plan, fund, engineer, bid, complete, and test. The commenters indicated that changes to monitoring requirements will also require time to understand and to conduct additional programming to data collection systems in order to comply with the revised monitoring and recordkeeping requirements. According to the commenters, some mills will have to perform capital projects to comply with the proposed ESP voltage and current monitoring and recordkeeping requirements. The commenters stated that systems will have to be put in place to comply with the new excess emissions recordkeeping and reporting requirements, including development of methodologies to estimate excess emissions. The commenters concluded that, when all of these changes are combined, 1 year is not sufficient time to put systems in place to comply. Commenter 0171 recommended that facilities be given 3 years as compliance time.

**Response:** We have set the compliance date specified in §63.863(c) for the revisions to subpart MM at 2 years following publication of the final rule in the **Federal Register** to allow sufficient time for existing sources to adjust to the revised excess emissions recordkeeping and reporting requirements. As noted in response to comment 6.3-01, the initial compliance date for electronic excess emissions reporting will be 1 year after the semiannual excess emissions reporting form (*i.e.*, spreadsheet template) becomes available in CEDRI. A compliance date 2 years after publication allows 1 year for beta-testing of the e-reporting form before it is placed into CEDRI, followed by 1 year for facilities to begin using the final form. The requirement to upload any initial notification or notification of compliance status files (in user-specified format) into CEDRI also takes effect 2 years following the effective date of the final rule. A period of 3 years after publication is not needed for compliance with the final rule amendments because, as explained elsewhere, the EPA is not finalizing the proposed revisions to the opacity limits or ESP parameter monitoring requirements that would involve capital projects. New sources built after publication of the amendments must comply with the standards immediately per CAA section 112(i)(1).



## 8. Regulatory Impacts

**8-01 Comment:** Commenter 0168 expressed a number of concerns regarding the EPA's cost estimates for tightening the opacity limits and monitoring allowances. The commenter noted that, when proposing to make changes to a MACT standard pursuant to a technology review, the EPA must consider costs and benefits under CAA section 112(d)(6) and EO 13563. Although "the risks due to HAP emissions from this source category are low for all populations,"<sup>142</sup> and no changes are proposed to the PM limits, the commenter noted that the EPA has proposed to lower the opacity operating limit for existing recovery furnaces and to lower the threshold at which a violation of the standard occurs for recovery furnaces and lime kilns. According to the commenter, the EPA admitted that they "do not expect this proposal to achieve significant reductions in HAP emissions"<sup>143</sup> and a footnote to Table 5 in the preamble indicates that the cost of the proposed opacity changes is ">\$5.5 million per ton HAP metals."<sup>144</sup> The commenter pointed out that the EPA has determined that values much less than this are not cost-effective for additional control of HAP metals under other RTR rulemakings (*e.g.*, Primary Aluminum, Chromium Electroplating).

Commenter 0168 noted that, to estimate the cost of the proposed opacity changes, the EPA analyzed COMS data from 2009 and determined which recovery furnaces experienced 6-minute average opacities over 20 percent more than 2 percent of the time in each semiannual period. To the commenter's knowledge, the EPA did not query facilities on the cause of those exceedances to determine what strategies would be taken to reduce opacity below 20 percent for more than 98 percent of the time (or 99 percent of the time for lime kilns). According to the commenter, the EPA simply assumed that if the PM test data provided in the ICR was at or below the new source limit a facility could reduce opacity by performing more frequent maintenance on the ESP, and if the PM test data were above the new source limit that a facility would add two parallel fields to the existing ESP. The commenter contended that the EPA never attempted to describe how tightening opacity monitoring requirements would provide additional assurance that the PM emissions standard is being met, or why additional assurance might be needed, given each of the recovery furnaces identified as potentially being affected by tightened opacity requirements were demonstrating PM levels with 40 percent or more compliance margin.

Commenter 0168 stated that the EPA did not consider that the impact of its proposed changes to the opacity monitoring requirements could be that facilities would be required to shut down more often to troubleshoot occurrences of opacities above 20 percent, rather than reducing load and repairing a section of an ESP on the fly. The commenter noted that ongoing lost production costs are not included in the EPA's cost analysis for the proposed opacity changes (the cost of shutting down is high).

For units with PM test data below the new source standard, commenter 0168 stated that a capital project on a component such as the ESP ash handling system or a project to rebuild the ESP internals could be required to improve reliability, rather than just more frequent maintenance. The commenter noted that the EPA's cost analysis for units with emissions above

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<sup>142</sup> 81 FR 97067

<sup>143</sup> *Id.*

<sup>144</sup> 81 FR 97073

the new source limit assumes that each unit is configured such that there is space available for addition of two parallel fields to the ESP. The commenter contended that this is not the case in many situations, as a recovery furnace ESP is typically located above ground level. The commenter further stated that the EPA's cost analysis covered only a handful of mills but did not include any site-specific analysis of the feasibility of its proposed solutions. According to the commenter, an ESP nearing the end of its useful life or one without additional expansion space available may be replaced with a unit capable of meeting the new source standard instead of upgraded with an additional set of fields, which would increase the capital cost of this proposed change by a factor of five (e.g., \$200 million instead of \$42 million) when the BE&K cost estimate for a new ESP is compared to the BE&K cost estimate for adding two parallel fields.<sup>145</sup>

Commenter 0168 noted that their member companies have indicated that there are additional units that would be adversely affected by the proposed change in opacity requirements, based on the member companies' review of more recent and more extensive data. Commenter 0168 noted that one member company (commenter 0164) indicated that their mill was not included in the EPA's cost analysis. Commenter 0164 projected that this mill will need to upgrade or replace its ESP to comply with the proposed 20 percent opacity limit. According to commenter 0164, capital cost estimates that the mill has received for upgrading or replacing the ESP range from about \$11 to \$34 million, which are considerably higher than what the EPA has estimated.

Commenter 0164 also indicated that the EPA's assessment of costs is not complete and results in underestimating the compliance cost for some individual companies and most likely for the sector. The commenter noted that the EPA's cost analysis included the Domtar Hawesville Mill, to add two fields to an existing recovery furnace ESP for a capital cost of \$4,757,613. The commenter stated that the mill's preliminary cost estimate for adding two additional fields and associated duct modifications, *etc.* is about 50 percent higher than the EPA's cost estimate. According to the commenter, the EPA's cost estimates most likely underestimate actual facility costs due to not taking into account site-specific situations such as space constraints.

Commenter 0166 stated that the proposed opacity standard will require their company to install a new dry ESP for at least one facility to assure compliance with the new limits at its current production rate, with the potential installation of two others at facilities to assure compliance at their design capacity. According to the commenter, they have estimated the known ESP replacement cost to be between \$10 and 16 million, which the commenter argued is not cost-effective for the minimal reduction in emissions. The commenter noted that capital costs have not been estimated for the two potential ESP replacement or upgrades that may be necessary, but indicated they could cost a similar amount to the known ESP replacement noted above.

Commenter 0168 argued that, even though the EPA's analysis lacks certain elements and makes certain unfounded assumptions, the fact that the cost of this change is projected to be more than \$5.5 million per ton of HAP metals (and that some of the estimated cost impact to facilities results in no emissions reductions) should be enough to conclude that the proposed

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<sup>145</sup> BE&K Engineering. *Emission Control Study – Technology Cost Estimates*. Prepared for the American Forest & Paper Association. September 2001.

opacity-related changes are not cost-effective. The commenter stated that the EPA's estimated cost of \$36,800/ton PM would not be cost-effective in a BACT analysis and should not be considered cost-effective in an RTR rulemaking where there is no risk or technology-related basis for the proposed change. The commenter concluded that the increased capital and operating costs that would result from the proposed change are not justified.

**Response:** We have reviewed the concerns from commenters about the costs of the proposed recovery furnace opacity option and have updated our cost estimates based on the assumption that ESP upgrades would be required for the 15 recovery furnaces expected to be impacted instead of the proposal assumption of improved maintenance. This updated cost estimate shows the impact of the proposed recovery furnace opacity option to be \$124 million in capital and \$18 to \$21 million annualized, at 3 and 7 percent interest, respectively, with an approximate cost in excess of \$250 million per ton of HAP metals. At this cost, this option is not cost-effective; therefore, we are finalizing an opacity limit of 35 percent, with a corrective action level of 20 percent and a 2 percent monitoring allowance (see our full response in section 3.2.2.1 of this document). Our review of available COMS data shows that all recovery furnaces can meet this limit, so we do not expect any costs associated with this option.

**8-02 Comment:** Commenter 0168 noted that ongoing lost production costs are not included in the EPA's cost analysis for the ESP power requirement (the cost of shutting down is high). According to the commenter, the EPA has only estimated the cost of the monitoring for its proposed addition of ESP power monitoring. The commenter indicated that additional testing could be necessary to determine the appropriate ESP power operating parameter limit for low-load operation. In addition, the commenter noted that their members (including commenter 0164) indicate that the cost of adding the ESP voltage and current monitoring to an existing DAS is higher than the EPA's estimate of \$31,000. Based on their members' experience either investigating the cost to add ESP power monitoring to a DAS or implementing this change, the commenter indicated that this is an \$80,000 to \$100,000 effort to properly implement.

**Response:** Using the midpoint of the commenter's \$80,000 to \$100,000 cost estimate, and applying it to all 183 recovery furnace and lime kiln ESP stacks currently in operation, we estimate that adding ESP parameter monitoring for existing sources would total \$16 million in capital costs and \$3.6 to \$4.0 million in annual costs (at 3 percent and 7 percent interest, respectively) nationwide.<sup>146</sup> Considering the revised costs associated with adding ESP monitoring for existing sources and the availability of an operating practice that facilities are currently using (*i.e.*, proper operation of the ESP's AVC) (see section 3.2.2.2), we are not finalizing the proposed ESP parameter monitoring requirements. Instead we are finalizing a requirement to maintain proper operation of the ESP's AVC. Because existing ESPs already have AVCs, we have associated no cost with this requirement beyond recordkeeping costs. Finally, with the change in ESP compliance requirements, the commenters' suggestion that additional testing may be necessary is no longer applicable.

**8-03 Comment:** Commenter 0168 concurred with the EPA's determinations that it is not cost-effective to require all remaining DCE recovery furnaces to convert to NDCE furnaces or to

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<sup>146</sup> Holloway, T., RTI. *Revised Costs/Impacts of the Subpart MM Residual Risk and Technology Review for Promulgation*. Memorandum to K. Spence, U.S. EPA.

convert wet-bottom ESPs to dry-bottom ESPs. The commenter appreciated that the EPA used their more recent cost analysis, based on recent member projects and evaluations, rather than a dated engineering estimate that does not cover all the project elements that would be required for such a conversion.

**Response:** We acknowledge the commenter's support for our conclusion that recovery furnace conversion/replacement is not justified based on the results of our section 112(d)(6) technology review. Our cost analysis for the review was based on cost estimates provided by the industry for actual/planned recovery furnace conversion/replacement projects,<sup>147</sup> supplemented with additional cost estimates from other sources,<sup>148,149,150,151</sup> which are included in the docket for this action.

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<sup>147</sup> AECOM. *AF&PA White Paper: Information on DCE Recovery Furnace Conversions and Replacements*. June 17, 2016.

<sup>148</sup> Andover Technology Partners. *ISIS Emissions Control for Pulp and Paper Plants*. Memorandum to W. Yelverton, M. Witosky, and E. Torres, U.S. EPA, and K. Hanks, RTI International. March 15, 2010.

<sup>149</sup> BE&K Engineering. *Emission Control Study – Technology Cost Estimates*. Prepared for American Forest & Paper Association. September 2001.

<sup>150</sup> U.S. EPA. *Technical Support Document: Chemical Recovery Combustion Sources at Kraft and Soda Pulp Mills*. Publication No. EPA-453/R-96-012. October 1996. Available at [https://www3.epa.gov/ttn/caaa/t3/reports/kraft\\_tsd/tsd-toc.pdf](https://www3.epa.gov/ttn/caaa/t3/reports/kraft_tsd/tsd-toc.pdf).

<sup>151</sup> U.S. EPA. *EPA Air Pollution Control Cost Manual*. Sixth Edition. Publication No. EPA/452/B-02-001. January 2002. Available at [https://www3.epa.gov/ttncaatc1/dir1/c\\_allchs.pdf](https://www3.epa.gov/ttncaatc1/dir1/c_allchs.pdf).

## 9. Miscellaneous Comments

### 9.1 Definitions

**9.1-01 Comment:** Commenter 0168 stated that definitions of startup and shutdown are needed in order to implement the EPA's proposed monitoring and recordkeeping changes. According to the commenter, the EPA has not proposed alternate standards during periods of startup and shutdown, but has proposed some adjustments and clarifications to accommodate startup and shutdown periods for recovery furnaces and lime kilns. The commenter noted that the EPA has proposed to clarify at §63.864(k) that monitoring exceedances only occur during times when lime mud or pulping liquor is fired and that corrective action can include "completion of transient startup and shutdown conditions as expediently as possible." The commenter noted that the EPA has also proposed that a scrubber pressure drop exceedance or an ESP total secondary current or total secondary power exceedance cannot occur during periods of startup or shutdown. The commenter believes it is appropriate for the EPA to acknowledge that operations of emissions control equipment are different during periods of startup and shutdown than during periods of steady state, normal operation, and that the proposed monitoring provisions that accommodate these differences in operation are appropriate.

Commenter 0168 noted that these changes are being proposed because the EPA indicated it must expand applicability of the standards and eliminate the requirement to develop and follow an SSM plan (which include site-specific definitions of and procedures for startup and shutdown). Therefore, the commenter indicated that the EPA needs to include a requirement for facilities to document the definition of startup and shutdown for each affected smelt tank, lime kiln, and recovery furnace if facilities are to have clarity on the ongoing compliance requirements and what constitutes a monitoring exceedance.

With the addition of the statement that operating parameter limits only apply during periods when lime mud and liquor are being fired, commenter 0168 stated that the EPA is correctly acknowledging that the emission limits should not apply during periods when auxiliary fuel is being burned to warm up the equipment. The commenter noted that auxiliary fuel (natural gas or fuel oil) is fired to start up recovery furnaces and lime kilns and that PM control equipment is always engaged prior to burning lime mud or liquor. However, in the case of wet scrubbers, the commenter stated that pressure drop can often depend on the exhaust gas flow through the scrubber. Therefore, the commenter noted that a minimum pressure drop operating parameter limit established during full load compliance testing will not be feasible to achieve during startup and shutdown. Likewise, the commenter noted that ESPs typically operate using power management software, and full power to the ESP is not needed during low-load startup and shutdown scenarios.

To improve clarity and ensure ongoing compliance is managed consistently and with certainty, commenter 0168 suggested that the EPA should reword §63.864(k)(1) and (2) to indicate monitoring parameter exceedances and violations do not occur unless lime mud or liquor is "fed" instead of "fired." The commenter stated that this change is consistent with the language in the Boiler MACT shutdown definition that acknowledges that some residual solid material may combust in a unit as shutdown progresses. In addition, the commenter suggested that the EPA should either require facilities to establish unit-specific definitions of startup and

shutdown or add definitions of startup and shutdown to the rule. Because operations vary from site to site, the commenter believes that the best approach would be to allow each facility to define the beginning and end of startup and shutdown for each affected unit. The commenter indicated that these definitions could be maintained onsite and submitted to the appropriate permitting authority upon request.

Commenter 0168 stated that the beginning of startup is fairly easy to define, as either the first ever feeding of lime mud, spent pulping liquor, or smelt in a unit for purposes of either calcining lime mud or recovering pulping chemicals; or the feeding of lime mud, spent pulping liquor, or smelt to a unit after completion of a shutdown event. However, the commenter indicated that the end of startup is more problematic to universally define, as units operate differently and take different amounts of time to reach steady state conditions. The commenter stated that end of startup for a recovery furnace could be a certain amount of time after liquor is fired in a recovery furnace, to ensure steady state firing conditions have been reached (similar to the 4-hour time period allowed in Boiler MACT), or when the unit has reached the liquor firing rate that no longer requires auxiliary fuel to sustain combustion. The commenter stated that the end of startup for a lime kiln could be when lime of acceptable quality is produced. The commenter stated that the end of startup for a smelt tank could be when green liquor of acceptable quality is produced. Similarly, the commenter stated that the beginning of shutdown would be when the operator begins to cease operation of the unit (*e.g.*, feeding of liquor, smelt, or lime mud is reduced for the purposes of ceasing operation). The commenter stated that the end of shutdown could be when liquor firing has ceased, there is no smelt running to the smelt tank, and when lime production has ceased.

Commenter 0168 stated that startup and shutdown definitions are also needed to comply with the EPA's proposed recordkeeping addition at §63.866(c)(8): "Records of the date, time, and duration of each startup and/or shutdown period, recording the periods when the affected source was subject to the standard applicable to startup and shutdown." If the rule does not establish how to define startup and shutdown periods, the commenter indicated that affected facilities cannot be clear on how to implement this requirement. The commenter was also not clear on what the requirement of "recording the periods when the affected source was subject to the standard applicable to startup and shutdown" adds to the record, when date, time, and duration are already required, and the commenter suggested striking this part of the requirement because it is redundant. (The commenter was also unclear as to what "standard" the EPA is referencing, since there is no separate standard for startup and shutdown.) To further reduce the burden of this new requirement, the commenter suggested that the EPA only require this recordkeeping if the facility has an operating parameter exceedance during a startup or shutdown event. According to the commenter, the date, time, and duration of each startup and shutdown period is only relevant if there are operating parameter limit exceedances to report or excuse as not applicable during these times. The commenter stated that allowing each facility to work with their permitting authority to establish a regulatory definition of startup and shutdown will also reduce the burden of this additional recordkeeping, since current systems are set up to identify the beginning and end of unit startup and shutdown as part of compliance with SSM plans.

**Response:** The part 63 General Provisions provide generic definitions of "startup," and "shutdown." The EPA has not included rigorous, equipment-specific definitions of these terms in subpart MM because defining these terms on an equipment-specific basis adds complexity to the

rule and inevitably would create issues where a “one-size-fits-all” definition is not a good fit for the entire population of subpart MM affected emission units. Most mills are likely to have site-specific criteria that they use in distinguishing startup and shutdown within the framework of the General Provisions definitions. The §63.866(c)(8) requirement to keep “records of the date, time, and duration of each startup and/or shutdown period, recording the periods when the affected source was subject to the standard applicable to startup and shutdown,” was proposed to be added to help characterize minor exceptions to reporting during startup or shutdown (*i.e.*, the exceptions from reporting scrubber pressure drop, ESP secondary current, or ESP secondary power). Given that these were proposed exceptions to the “applicable standard during startup or shutdown,” rather than the “applicable standard during startup and shutdown” itself, this provision has not been finalized in the final rule. The applicable standards during startup and shutdown continue to include the emission limits (*e.g.*, PM or THC limits), operating limits (*e.g.*, opacity, wet scrubber liquid flow rate, and/or the ESP AVC work practice).

We concur with the commenter’s request for the EPA to reword §63.864(k)(1) and (2) to indicate monitoring parameter exceedances and violations do not occur unless lime mud or liquor is “fed” instead of “fired.” We agree that this change will improve the clarity of the rule.

Regarding the commenter’s concern that full power to the ESP is not needed during low-load startup and shutdown scenarios and assertion that ESPs typically operate using power management software, we note that ESPs also operate using AVCs (see comment 3.2.2.2-01), and we have determined that reducing the ESP parameter monitoring requirements to a requirement to maintain proper operation of the AVC addresses the commenter’s concern.

**9.1-02 Comment:** Two commenters (0164, 0168) supported the EPA’s clarification to the definition of PM. The commenters noted that the EPA proposed to clarify the definition of “particulate matter (PM)” at §63.861 by specifying that it includes only the filterable portion of PM. The commenters stated that this is an appropriate clarification because the compliance method is Method 5, which measures only filterable PM.

**Response:** We acknowledge the commenter’s support for defining PM as filterable PM and are finalizing the revised definition of PM as proposed.

## 9.2 Notice and Comment

**9.2-01 Comment:** Commenter 0173 argued that the EPA did not meet the requirements of the CAA to provide meaningful public notice and an opportunity for comment and public participation on the proposed rule, its rationale, and all underlying data and documents that the Agency uses to support the proposed rule.<sup>152</sup>

Commenter 0173 stated that there are many components of the EPA’s health risk assessment for which the EPA provided no information regarding how it reached its calculations or proposed policy determination. For example, the commenter noted that the EPA has not provided the list of chemicals for which it has assessed no risk at all, or for which it has not assessed a known or probable risk due to a lack of a reference value. The commenter stated that

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<sup>152</sup> 42 U.S.C. 7607(d)(3), (h).

the EPA's failure to provide the list of chemicals for which the EPA is taking this approach is a violation of notice and comment. The commenter stated that the table the EPA has provided that lists different values does not state which chemicals the EPA has quantified no risk for at all. Although the commenter has been able to tell that there are some chemicals – such as lead – for which the EPA quantified no risk, the commenter has not received public notice on all such chemicals. According to the commenter, this list is needed to enable meaningful comment on the full extent of the impact of the EPA's failure to quantify and assess any risks on this risk assessment.

Commenter 0173 also noted that the EPA has not provided any underlying documentation or information regarding the lead NAAQS evaluation it cites as the basis for finding no unacceptable risk due to the lack of exceedances of the NAAQS. Absent the ability to review that documentation, the commenter stated they would have no meaningful notice or ability to comment on the EPA's proposed determination that lead risk is acceptable.

In addition, commenter 0173 noted that the EPA has not provided the list of carcinogens that it considers mutagenic, and for which it applied age-dependent adjustment factors. According to the commenter, the EPA also has not provided the list of carcinogens for which it did not do this, or any underlying information explaining why the EPA did not treat these carcinogens as mutagenic. Absent this information, the commenter stated that they have no meaningful notice or opportunity to comment on the EPA's proposed determination that cancer risk is acceptable.

Commenter 0173 noted that, for the EPA's multipathway risk assessment, the EPA has provided no supporting material showing how it reached the various tiering data determinations in the draft risk assessment. The commenter stated that the EPA also has not provided any information showing the names of each of the facilities listed as a group in the table in the draft risk assessment that summarizes the tiering information. Absent this information in the record, the commenter stated that they have inadequate notice and are unable to comment meaningfully on the EPA's proposed determination not to complete the multipathway risk assessment by doing no refined assessment for any facility.

According to commenter 0173, the EPA's facility-wide risk assessment contains no explanation or supporting material regarding how the EPA created the numbers included therein, and it is unclear what other sources the EPA evaluated. The commenter stated that it is unclear how the EPA reached the risk numbers listed in the draft risk assessment at each facility and how the EPA created cut-offs that it has for each line in the table. Absent these pieces of information, the commenter stated that they have no meaningful notice or opportunity to comment on these values or the EPA's proposed determination which relies on this facility-wide risk assessment.

In addition, commenter 0173 noted that the EPA cited and relied on multiple industry trade association-created documents that are not available in the online public rulemaking record -- including multiple reports by the industry-run "National Council for Air and Stream Improvement," which performs "environmental research for the forest products industry."<sup>153</sup> The

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<sup>153</sup> See <http://www.ncasi.org/About-NCASI/Index.aspx>; see, e.g., <http://ncasi.org/Programs/Reports-and-Articles/Technical-Bulletins-and-Special-Reports/Technical-Bulletins/Index.aspx>.



commenter noted that the EPA's sole basis for not releasing the NCASI documents appears to be copyright; but the commenter stated it is not the EPA's job to protect copyright, particularly for an industry-provided document that industry has given the EPA to influence its rulemaking actions. The commenter noted that the CAA does not say in section 307(d)(3), (h), provide all documents "except those subject to copyright protections." Thus, the commenter argued it is unlawful for the EPA not to provide all of these documents for public review. According to the commenter, this results in de facto preferential treatment for industry's interests. The commenter contended that the EPA is willing to consider industry-created documents -- while not even giving the public a chance to review or consider those documents.

Commenter 0173 noted that the EPA also cited, and incorporated by reference, documents in prior rulemaking dockets that (1) the EPA did not place into the public docket for this rulemaking, and (2) are not available anywhere online.

According to commenter 0173, the EPA's failure to present for public notice and comment the above, and all other, documents that the Agency is considering, using, and relying on in any way in this rulemaking is unlawful. The commenter argued that it violates the CAA's requirements to publish these documents in section 307(d)(3), (h). The commenter argued that the EPA's failure to provide all documents it is using in this risk assessment and in this rulemaking in the public docket for notice and comment is also arbitrary and capricious because it makes it difficult for the public and affected community members to be able to review and provide effective comments on the EPA's proposed rule.

**Response:** We disagree with the commenter's assertion that the EPA did not meet the requirements of the CAA to provide meaningful public notice and comment. We note the following concerns from the commenter and provide our responses below:

- *The EPA did not state which HAP currently have no reference value:* In the risk assessment document, Table 3.1-1 lists all the HAP emitted by the source category, and indicates whether there is an available cancer, chronic noncancer, and/or acute dose-response value.
- *The EPA did not provide any documentation or information regarding the lead NAAQS evaluation:* The risk assessment document includes a detailed discussion of how the lead NAAQS was evaluated (see pp. 48-50 of that document) and, as reference, cites the original lead NAAQS FR notice throughout, (73 FR 66970-81, 66998, 67004, 67006-7).
- *The EPA did not provide a list of carcinogens where we do or do not have information on mutagenic MOA:* The risk assessment document includes both a reference and a weblink to an EPA document *Supplemental guidance for assessing early-life exposure to carcinogens*, [https://www3.epa.gov/ttn/atw/childrens\\_supplement\\_final.pdf](https://www3.epa.gov/ttn/atw/childrens_supplement_final.pdf), where this information is provided in Tables 1a and 1b of that document.
- *The EPA did not provide supporting material regarding the tiering determinations:* The risk assessment document (see pp. 12-15 and App. 6) includes a thorough discussion of the tiering methodology used in the multipathway risk assessment. Regarding facility-specific information for the multipathway assessment, we note that the risk assessment document (p. 39) states the following:

When tiered screening values for any facility indicate a potential health risk to the public, we can conduct a more refined multipathway assessment for a specific facility. A refined assessment replaces some of the assumptions made in the tiered screening with facility-specific information. Since none of the facilities in this source emitted hazardous air pollutants at a rate that exceeded all of the tiered screening levels, a facility-specific multipathway assessment was not warranted. As such, Appendices 7 and 11 of this document are intentionally blank.

- *The EPA did not provide supporting materials regarding how the facility-wide risk results were determined:* Facility-wide emissions data were obtained through the 2011 pulp and paper sector ICR and App. 1 to the risk report includes thorough documentation of the emissions data used for both source category and facility-wide modeling. App. 10 to the risk assessment document includes a thorough documentation of the facility-wide risk assessment.

Regarding access to copyrighted materials, the preamble to the proposed rule states the following:

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.

Information on the copyrighted materials such as abstracts or website addresses where the copyrighted material could be obtained were provided in the proposal docket. The NCASI technical bulletins to which the commenter refers were used by the EPA to obtain emission factors and generate speciation profiles for development of the risk modeling file in conjunction with production data obtained from the ICR. The data used from the technical bulletins and the modeling file development process was thoroughly discussed in the memorandum in the docket titled *Preparation of Residual Risk Modeling Input File for Subpart MM* (see Docket Item No. EPA-HQ-OAR-2014-0741-0099). The resulting emissions data used as input for the residual risk modeling were made available for public comment on the EPA's website at <https://www.epa.gov/stationary-sources-air-pollution/pulp-and-paper-submitting-data-corrections>. Production rates were not provided as most were classified as CBI, and were not needed to assess the emissions data used in the modeling file. Because the modeling file development process documentation and the resulting emissions estimates were provided in the docket for public comment, including the data that was obtained from the copyright materials, the commenters were provided a meaningful opportunity to comment.

Regarding access to prior rulemaking dockets, the EPA is not legally obligated to make previous paper dockets available online, and such an effort would be extremely resource-intensive and time-consuming. Also, it should be noted that the commenter can contact the docket office at any time and request documents from prior dockets. The contact information for the docket office is provided in the preamble to the proposed rule, (81 FR 97046).

## 9.3 Statutory and Executive Order Reviews

**9.3-01 Comment:** Commenter 0168 noted that the EPA’s cost estimate for changes to recordkeeping and reporting requirements, conducted in accordance with the Paperwork Reduction Act (PRA), only includes recovery furnaces with ESPs. The commenter stated that there are other recordkeeping and reporting changes that will increase burden, such as the proposed changes to the excess emissions recordkeeping and reporting requirements.

**Response:** We disagree with the commenter’s assertion that our burden and cost estimates for changes to recordkeeping and reporting requirements only included recovery furnaces with ESPs. In addition to the burden and cost estimates for changes in recovery furnace and lime kiln ESP monitoring, we also included burden and cost estimates for the proposed periodic emissions testing for all process units in our supporting statement for the proposed rule. However, we acknowledge that we could have more fully addressed the burden and cost of the proposed changes to the excess emissions recordkeeping and reporting requirements. We revised the supporting statement for the final rule to address public comments, including the commenter’s concerns about including the full burden and cost of the proposed changes. We added a line item for “Time to adjust existing ways to comply with previously applicable requirements” to the supporting statement to capture the burden and cost associated with adjusting existing DAS to transition to electronic excess emissions reporting through CEDRI, as well as to include startup and shutdown periods and the revised opacity monitoring allowances.

**9.3-02 Comment:** Commenter 0173 noted that they are aware that after the EPA proposed this rule, President Trump signed an unlawful, arbitrary, and capricious executive order: EO 13771, 82 FR 9339 (Feb. 3, 2017). Commenter 0173 noted that a number of groups represented by the commenter have challenged that executive order in court as unlawful, arbitrary, and capricious. The commenter argued that the EPA cannot lawfully or rationally rely on that executive order in this rulemaking, nor can the Agency allow that order to influence development of the final rule. According to the commenter, the CAA provides specific requirements for reviewing, revising, and promulgating NESHAP.

Commenter 0173 stated that an executive order cannot override a statute, limit the authority delegated and the legal responsibilities provided to the EPA Administrator by federal law, add factors that are impermissible under the statute, or delay statutorily required agency action.<sup>154</sup> The commenter also noted that weakening or delaying improvements contained in this proposed rule, or any other public health and safety improvements, due to the executive order would be contrary to the public health and environmental responsibilities and requirements of the EPA to reduce the amount of toxic air pollution and resulting health and environmental threats that the sources at issue in this rulemaking cause. Finally, the commenter argued that it would be unlawful for the EPA to consider or apply that executive order in any way in this rulemaking without providing the requisite public notice and opportunity for comment that the CAA requires.<sup>155</sup>

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<sup>154</sup> See, e.g., *In re: United Mine Workers of Am. Int’l Union*, 190 F.3d 545, 551 (D.C. Cir. 1999).

<sup>155</sup> 42 U.S.C. 7607(d)(3)-(7), (h).

**Response:** The pulp and paper subpart MM proposal (signed by the Administrator on December 13, 2016 and published in the **Federal Register** on December 30, 2016) occurred prior to publication of EO 13771 (January 30, 2017). As such, it was not possible to evaluate this executive order prior to proposal. In addition, the Office of Management and Budget (OMB) determined that the final rule is not a significant regulatory action under EO 12866; therefore, it is not subject to EO 13771.

## 9.4 Commenter Endorsements

**9.4-01 Comment:** Commenter endorsements are listed as follows:

- Multiple commenters (0164, 0166, 0169, 0171) supported the comments submitted by commenter 0168 on the proposed rule.
- Multiple commenters (0164, 0166, 0168) supported the comments submitted by commenter 0167 on the proposed rule.
- Multiple commenters (0164, 0168) supported the comments submitted by commenter 0170 on the proposed rule.

**Response:** We acknowledge the commenters' collective support for the AF&PA, NCASI, and SSM Coalition comments.

## 9.5 Other Comments

**9.5-01 Comment:** Commenter 0172 stated that, based on their experience, they believe that present limits on NESHAP air emissions are inadequate to protect human health. The commenter argued that equipment upgrades at the Port Townsend kraft pulp mill to comply with incoming standards have addressed only a small amount of the mill's overall pollution profile, and the change in emissions have not proven to be sufficient, as evidenced by the fact that the population around the mill continue to be sickened by the mill's plume. The commenter noted the following:

- Surprisingly often, legally mandated upgrades or NSPS conditions have been met by agreeing to use "Good Operating Practices" -- which means no change.
- According to the (negotiated) terms of Port Townsend's air and water operating permits, the mill generally operates well within their statutory limits. Even so, those who live, work and recreate here continue to get ill.
- For many years they have submitted copious complaints to the Washington Department of Ecology, but according to them, as long as the mill operates within the terms of their permit, no further action is needed. In 2016, their townspeople submitted around 600 complaints, yet nothing changed. Surprisingly, their complaints are part of the mill's monitoring system but the alarms they raise don't trigger action because, they are told, the mill is operating within NESHAP limits, it was a malfunction, or a slight adjustment was needed.

Commenter 0172 asked whether they should be experiencing this if NESHAP limits, with or without SSM exemptions, are sufficient to protect people's health.

Commenter 0172 noted that they have turned to the regulators and agencies repeatedly for enforcement under the "protective of health" statutes and are regularly met with shrugs and responses of "we have no authority." The commenter stated that, surely, people's ill health and the statutes bless them with the authority. The commenter stated that the fact that they are still becoming ill from what is presented as compliance with statutory limits, indicates loud and clear that the limits are not sufficient to protect human health.

Commenter 0172 noted that in a survey of data from the Washington State Cancer Registry that they did some years back they found that for 2001-2003 Jefferson County reported as number 1, 2 or 3 among Washington's 39 counties, in incidence and/or mortality for nearly half of the cancer types (sites) that the registry records. A slightly different review found that across 10 consecutive 3-year rolling averages (1992-2004), Jefferson County repeatedly ranked in the top five of the 39 Washington counties for several cancer sites.<sup>156,157</sup>

Commenter 0172 stated that, where they are prone to exceed numeric limits, Port Townsend generally can average the exceedance away or term it an SSM event. In the past, the commenter noted that they have learned of the mill using the exemption somewhat regularly because much of their equipment is 50-100 years old and showing its age. The commenter also noted that ECHO shows them out of compliance a fair number of quarters in any given year.

Commenter 0172 was concerned about the lack of effectiveness of existing NESHAPs and oversight rules with respect to kraft pulp mills. The commenter was concerned for instance that, under the rubric of mitigating the odor from the aeration stabilization basin (ASB) by seeking to reduce mercaptans (which can cause health problems themselves in sufficient concentration), that Port Townsend is in effect "masking" other toxic chemical emissions. The commenter stated that other potentially toxic or hazardous emissions from the ASB are not well characterized because the mill models the ASB emissions, and the commenter had no evidence that the mill actually samples the air that comes off of the pond. The commenter was concerned that modeling without regular ground-truthing too often misses actual pollution.

Commenter 0172 was also concerned that alternative monitoring, use of data tables or over-reliance on "best practices" leads to lax enforcement of already well-outdated standards. According to the commenter, underlying all of this is the fact that at the same time that the Washington Department of Ecology presents graphs showing that the mill's typical operations are far below the legal limits, they continue to get sick.<sup>158,159</sup>

According to commenter 0172, in the heaviest hit path of the plume in their town, within a mile of the mill, are many of our most vulnerable people: many of their poorest neighborhoods, several schools, a majority of the town's childcare and elder care facilities, several medical facilities and the county hospital. The commenter stated that these populations are especially at risk when legal emission limits do not protect even those who are more sturdy.

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<sup>156</sup> 2003-2004 Elevated Cancer rates in Jefferson County, WA (example year)

<sup>157</sup> 1992-2004 Elevated Cancer incidence in Jefferson County, WA (10-years)

<sup>158</sup> 2012 PTPC reported pollution-TRI, criteria

<sup>159</sup> 2014-2015 PTPC reported pollution-TRI, criteria, GHG

Commenter 0172 stated that it was ironic that laws designed to protect them should be so weak as to allow this level of pollution to continue. The commenter supported Earthjustice and others who call for corrections to the laws, including lower NESHAP limits and closure of the SSM exemptions, to ensure clean, healthy air for them all.

Commenter 0172 attached several files to their public comment to illustrate the comments they have made and noted that records of their many complaints and reactions to the pollution are on file with the Washington Department of Ecology's Industrial Section.

**Response:** We acknowledge this comment and the concerns of the commenter, but note that comments pertaining to enforcement or compliance issues at specific facilities are outside the scope of this rulemaking. We should note that the final rule requires periodic emissions testing for chemical recovery combustion processes and removes the SSM exemption mentioned by the commenter—which should reduce the potential for the emissions episodes of concern to the commenter. We also note that section 304 of the CAA allows citizens to commence a civil suit against any person alleged to be in violation of “an emission standard or limitation under this chapter.” Regarding the enforcement of existing requirements, it is expected that there would be some discussion between the permitting authority and an affected source concerning its responsibilities with regard to permitting requirements.

**9.5-02 Comment:** Commenters 0172 and 0173 included a number of attachments to their public comments. The attachments are listed below:

Attachments to comment 0172:

- Attachment 1 - 2017 02 Regulatory Duty to Protect Health-Fed, WA
- Attachment 2 - 2000 Swedish Study on pulp mills and cancer
- Attachment 3 - 2003-2004 Elevated Cancer rates in Jefferson County, WA (example year)
- Attachment 4 - 1992-2004 Elevated Cancer incidence in Jefferson County, WA (10-years)
- Attachment 5 - 2012 PTPC reported pollution-TRI, criteria
- Attachment 6 - 2014-2015 PTPC reported pollution-TRI, criteria, GHG

Attachments to comment 0173:

- Attachment 1 - Comment
- Attachment 2 - 0002 EPA Facility Accident Data 2004-13 OLEM EPA
- Attachment 3 - 0349 EPA-ACC Teleconference discussing Accident Data
- Attachment 4 - 13 7 23 Comments (CBD - PTAW - Greenpeace) final
- Attachment 5 - 2005 Guidelines
- Attachment 6 - Am College of Obstetricians and Gynecologists Committee Opinion No. 575<sup>160</sup>
- Attachment 7 - Am Lung Assn - State of Lung Disease in Diverse Communities<sup>160</sup>
- Attachment 8 - Am Lung Assn - Too Many Cases, Too Many Deaths<sup>160</sup>

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<sup>160</sup> The attachment is restricted to show metadata only because it contains copyrighted data.

- Attachment 9 - Andersson Cohort Mortality Study of Swedish Pulp and Paper Mill Workers<sup>161</sup>
- Attachment 10 - Ammara *et al.* Kraft Mill Diagnostics (2016)<sup>161</sup>
- Attachment 11 - Andersson Incidence of Chronic Bronchitis in a Cohort of Pulp Mill Workers with Repeated Gassings
- Attachment 12 - Anna Tilman, The Toxic Story of Federal Regulatory Neglect
- Attachment 13 - Arkansas Department of Health Biweekly Report (Dec. 28 - Jan. 10, 2017)
- Attachment 14- Arkansas Department of Health Special Data Review Announcement (Feb. 7-8, 2017)
- Attachment 15 - Arkansas Department of Health Biweekly Report (Jan. 11-24, 2017)
- Attachments 16-20 - Arkansas Department of Health Special Data Review Announcement (Feb. 16, 2017; Jan. 28-30, 2017; Sept. 25, 2016; Sept. 28, 2016; Sept. 30, 2016)
- Attachment 21 - Babbitt *et al.* LCA of HAP Controls (2008)<sup>161</sup>
- Attachment 22 - Baseline Air Quality Modeling and Human Health Risk Assessment of Current Day Emissions from NorskeCanada Crofton Division
- Attachment 23 - Bergquist and Soderholm, Transition to Chlorine Free Pulp (US)
- Attachment 24 - Buckheit Report
- Attachment 25 - CalEPA - Acetaldehyde as a Toxic Air Contaminant
- Attachments 26-30 - CalEPA-Air Toxics Hot Spots Program Guidance Manual appx.A-N
- Attachment 31 - CalEPA-Air Toxics Hot Spots Program Guidance Manual
- Attachment 32 - CalEPA TSD for Cancer Potency appx.A
- Attachment 33 - CalEPA Cumulative Impacts
- Attachments 34-42 - CalEPA TSD for Cancer Potency appx.B-J
- Attachment 43 - CalEPA TSD for Cancer Potency
- Attachment 44 - CalEPA TSD for Exposure Assessment
- Attachments 45-54 - CalEPA TSD for NonCancer RELs appx.A-H
- Attachment 55 - Air Toxics Hot Spots Risk Assessment Guidelines: Technical Support Document for the Derivation of Noncancer Reference Exposure Levels
- Attachment 56 - Final Report: Definition for Inherently Safer Technology in Production, Transportation, Storage, and Use
- Attachment 57 - Kids in Danger Zones: One in Three U.S. Schoolchildren at Risk from Chemical Catastrophes
- Attachment 58 - Complaint for Declaratory and Injunctive Relief
- Attachment 59 - Endocrine-Disrupting Chemicals<sup>161</sup>
- Attachment 60 - Low-Dose Effects of Endocrine Disruptors, with Laura Vandenberg
- Attachments 61-62 - America's Children and the Environment [EPA 240-R-13-001] (Parts 1 & 2)
- Attachment 63 - Child-Specific Exposure Factors Handbook
- Attachment 64 - Concepts, Methods and Data Sources for Cumulative Health Risk Assessment of Multiple Chemicals, Exposures and Effects: A Resource Document [EPA/600/R-06/013F]

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<sup>161</sup> *Id.*

- Attachment 65 - Guide to Considering Children's Health When Developing EPA Actions: Implementing Executive Order 13045 and EPA's Policy on Evaluating Health Risks to Children
- Attachment 66 - Report of the Task Group of the Children's Health Protection Advisory Committee
- Attachment 67 - Interim Guidance on Considering Environmental Justice During the Development of an Action
- Attachment 68 - Residual Risk Report to Congress [EPA-453/R-99-001]
- Attachment 69 - National Air Toxics Program: The Second Integrated Urban Air Toxics Report to Congress [EPA-456/R-14-001]
- Attachment 70 - Summary of Public Comments on Chromium Electroplating and Steel Pickling Risk and Technology Review (RTR)
- Attachments 71-76 - Health Risk Assessment of Airborne Dioxin and Furan Emissions at the Elk Falls Pulp Mill (1994) parts 1-6
- Attachment 77 - Mesophilic Anaerobic Digestion of Pulp and Paper Industry Biosludge Long-Term Reactor Performance and Effects of Thermal Pretreatment<sup>162</sup>
- Attachment 78 - Wet vs. Dry Top Gas Cleaning Technology for Blast Furnaces<sup>162</sup>
- Attachment 79 - Administrator Lisa P. Jackson, Remarks to the National Environmental Justice Advisory Council, As Prepared
- Attachment 80 - Letter to Sarah Ross, Environment Department, Georgia Pacific, LLC (Crossett Paper Operations)
- Attachment 81 - Letter to Lisa Jackson from Pamela Shubat, Pamela Shubat, Chair, Children's Health Protection Advisory Committee
- Attachment 82 - MACT Standards for Pulp and Paper Industry Revised<sup>162</sup>
- Attachment 83 - Science and Decisions: Advancing Risk Assessment<sup>162</sup>
- Attachment 84 - Strengthening Toxic Chemical Risk Assessments to Protect Human Health<sup>162</sup>
- Attachment 85 - Pesticides in the Diets of Infants and Children<sup>162</sup>
- Attachment 86 - Proof is in the Permit<sup>162</sup>
- Attachment 87 - Potential Impact of Environmental Exposures to Polycyclic Organic Material (POM) on Children's Health
- Attachment 88 - Pulp-Pollution-Primer<sup>162</sup>
- Attachment 89 - Letter to Lisa P. Jackson, Administrator, USEPA from Deborah L. Swackhamer, Chair, Science Advisory Board, USEPA and Jana Milford, Chair, SAB RTR Methods Review Panel, USEPA
- Attachment 90 - Top 15 Virginia Localities with the Highest Toxic Air Emissions
- Attachment 91 - Cancer Risk Associated with Pulp and Paper Mills: A Review of Occupational and Community Epidemiology
- Attachment 92 - Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens [EPA/630/R-03/003F]
- Attachment 93 - Air Pollution and Emergency Department Visits for Headache and Migraine (2016)<sup>162</sup>

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<sup>162</sup> *Id.*



- Attachment 94 - Pulp Fiction Chemical Hazard Reduction at Pulp and Paper Mills
- Attachment 95 - Fix the Hazards Don't Paper Them Over<sup>163</sup>
- Attachment 96 - Health Consultation
- Attachment 97 - Papered Over Safety and Health in U.S. Paper Mills
- Attachment 98 - A Constructed Alkaline Consortium and Its Dynamics in Treating Alkaline Black Liquor with Very High Pollution Load
- Attachment 99 - Control of Emissions from Metal Grinding Operations at Metal Forging Facilities
- Attachment 100 - Gale Ward, Crossett Community Partner Statement
- Attachment 101 - Johnny and Pat Todd, Crossett Arkansas Community Partner Statement
- Attachment 102 - Lisa Henderson, Crossett Arkansas Community Partner Statement
- Attachment 103 - Sylvia Howard, Crossett Community Partner Statement

**Response:** We appreciate commenters 0172 and 0173 providing copies of the references they cited as support for their public comments. Based on our review of the attachments, we can conclude that the main points of the attachments have been covered in the public comments, which are summarized and responded to in this document. Consequently, this document does not include a separate summary of the information in the attachments.

**9.5-03 Comment:** Commenter 0173 requested that the EPA grant the petition seeking to list H<sub>2</sub>S as a HAP without further delay and regulate it at a pulp mills. The commenter also stated that the EPA has sufficient toxicity data on this pollutant to list and regulate this HAP from pulp mills in this rulemaking.

**Response:** The granting or denying of the H<sub>2</sub>S listing petition is out of the scope of this rulemaking.

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<sup>163</sup> *Id.*