Message

From: Goffman, Joseph [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23474D598E8D4EDFA9214A5991F2935B-GOFFMAN, JO]
Sent: 11/5/2021 1:18:53 AM
To: DeLuca, Isabel [DeLuca.Isabel@epa.gov]
CC: Millett, John [Millett.John@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]
Subject: RE: DDL: 9:30 a.m. ET, 11/5: Media Inquiry: E&E re Compliance costs for Mercury and Air Toxics Standards

No edits from me. Sorry to take so long to respond. Thanks.

Joseph Goffman
Acting Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

From: DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Sent: Thursday, November 4, 2021 5:39 PM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>
Cc: Millett, John <Millett.John@epa.gov>
Subject: FW: DDL: 9:30 a.m. ET, 11/5: Media Inquiry: E&E re Compliance costs for Mercury and Air Toxics Standards

Hi Joe,
We received an inquiry from Sean Reilly at E&E related to MATS. Ex. 5 Deliberative Process (DP)
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Ex. 5 Deliberative Process (DP) If you have edits, please let us know – Sean has asked for on-the-record responses by 9:30AM tomorrow.

Thanks,
Isabel

Incoming:
With the ten-year anniversary of MATS coming up, I'm working on a story for tomorrow that will note that there's considerable evidence that EPA's original $9.6 billion in projected annual compliance costs was significantly overstated, but that there doesn't appear to be any clarity from EPA as to what compliance actually did cost, despite this having long been the subject of public/legal scrutiny. The story will also note that a proposed EPA rule (screenshot attached) related to the Trump administration's revocation of the "appropriate and necessary" finding for MATS has now been at OMB's Office of Information and Regulatory Affairs for more than three months.

A couple of questions:

1. In regard to MATS compliance costs, has EPA developed a number that seeks to reflect the actual expense to the power industry and, if so, what is it? If not, does EPA have any plans to attempt to do so, either in the proposed rule now at OIRA or through some other means?

Draft response: The agency recognizes that estimating the cost of the MATS rule is an important element in weighing the advantages and disadvantages of the regulation. And EPA will soon again be responding to the 2015 Supreme Court decision that we must consider costs when evaluating whether the control of hazardous air pollutants from the electric generating utility sector is 'appropriate and necessary'. Since MATS was implemented, more information has become available about the actual costs of the rule. Several independent analyses have concluded that EPA's original cost estimates were too high and numerous groups, including some stakeholders in the utility sector, have previously submitted comments to that effect. We cannot comment in detail at this time about the specifics of the proposed re-

affirmation of the MATS A&N finding, however estimating the actual expense of the MATS rule is an important piece of the finding.

2. In Executive Order 13990 (https://www.federalregister.gov/documents/2021/01/25/2021-01765/protecting-public-health-and-the-environment-and-restoring-science-to-tackle-the-climate-crisis), President Biden charged EPA with making a proposal by this past August to address the revocation of the appropriate and necessary finding. What's your understanding of why, more than three months later, the proposed rule remains under review at OIRA and thus has yet to be made public? (I am of course also checking with OMB.)

Draft response: President Biden's January 20, 2021, Executive Order 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis," directs EPA to review and consider publishing a proposed action to suspend, revise, or rescind the May 22, 2020, final action known as the Mercury and Air Toxics Standards or MATS Supplemental Finding and Residual Risk and Technology Review. EPA responded to this directive by submitting a proposed action for interagency review on August 3, 2021.

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Thursday, November 04, 2021 9:47 AM
To: Millett, John <Millett.John@epa.gov>; DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>
Subject: DDL: 9:30 a.m. ET, 11/5: Media Inquiry: E&E re Compliance costs for Mercury and Air Toxics Standards

Please help! **DDL: 9:30 a.m. ET, 11/5.**

From: Sean Reilly <sreilly@eenews.net>
Date: November 4, 2021 at 9:42:10 AM EDT
To: EPA Press Office <press@epa.gov>
Subject: Compliance costs for Mercury and Air Toxics Standards

Hi folks:

With the ten-year anniversary of MATS coming up, I'm working on a story for tomorrow that will note that there's considerable evidence that EPA's original $9.6 billion in projected annual compliance costs was significantly overstated, but that there doesn't appear to be any clarity from EPA as to what compliance actually did cost, despite this having long been the subject of public/legal scrutiny. The story will also note that a proposed EPA rule (screenshot attached) related to the Trump administration's revocation of the "appropriate and necessary" finding for MATS has now been at OMB's Office of Information and Regulatory Affairs for more than three months.

A couple of questions:

1. In regard to MATS compliance costs, has EPA developed a number that seeks to reflect the actual expense to the power industry and, if so, what is it? If not, does EPA have any plans to attempt to do so, either in the proposed rule now at OIRA or through some other means?

2. In Executive Order 13990 (https://www.federalregister.gov/documents/2021/01/25/2021-01765/protecting-public-health-and-the-environment-and-restoring-science-to-tackle-the-climate-crisis), President Biden charged EPA with making a proposal by this past August to address the revocation of the appropriate and necessary finding. What's your understanding of why, more than three months later, the proposed rule remains under review at OIRA and thus has yet to be made public? (I am of course also checking with OMB.)

My deadline is 9:30 tomorrow morning. On-the-record responses, please.

Thanks,
Sean

Sean Reilly
Reporter
E&E News/Politico
202-316-4596 (Cell)
Skype: Sreilly_69
sreilly@eenews.net
Twitter: @SeanatGreenwire

3.

Environmental Protection Agency

AGENCY: EPA-OAR **RIN:** 2060-AV12 **Status:** Pending Review
TITLE: NESHAP: Coal- and Oil-Fired Electric Utility Steam Generating Units--Reconsideration of Supplemental Cost Finding and Residual Risk and Technology Review
STAGE: Proposed Rule **ECONOMICALLY SIGNIFICANT:** No
RECEIVED DATE: 08/03/2021 **LEGAL DEADLINE:** None

Message

From: Goffman, Joseph [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23474D598E8D4EDFA9214A5991F2935B-GOFFMAN, JO]
Sent: 11/22/2021 8:43:53 PM
To: Peter Tsirigotis (Tsirigotis.Peter@epa.gov) [Tsirigotis.Peter@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]
Subject: FW: statutory interpretation options memo
Attachments: Confidential--Statutory Interpretation options.docx

Ex. 5 Deliberative Process (DP)

Joseph Goffman
Principal Deputy Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

From: Weaver, Susannah <Weaver.Susannah@epa.gov>
Sent: Monday, November 22, 2021 3:33 PM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>; Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Cc: Hoffer, Melissa <Hoffer.Melissa@epa.gov>; Prieto, Jeffrey <Prieto.Jeffrey@epa.gov>
Subject: statutory interpretation options memo

Confidential—Deliberative—Attorney-Client—Attorney Work Product

Dear Joe and Tomás,

Ex. 5 Attorney Client (AC)

Thanks,
Susannah

Susannah Landes Weaver
Senior Counselor
Office of General Counsel
Environmental Protection Agency
(202) 564-1928 (office)
(202) 819-6517 (mobile)

Message

From: Goffman, Joseph [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23474D598E8D4EDFA9214A5991F2935B-GOFFMAN, JO]
Sent: 11/21/2021 10:53:03 PM
To: Peter Tsirigotis (Tsirigotis.Peter@epa.gov) [Tsirigotis.Peter@epa.gov]
Subject: FW: Hi Joe! Do you have a second to chat? My cell is +Ex. 6 Personal Privacy (PP). Just chatted with the Administrator.
Attachments: ALA v EPA 20210119_docket-19-1140_opinion.pdf

Joseph Goffman
Principal Deputy Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

-----Original Message-----
From: Goffman, Joseph
Sent: Sunday, November 21, 2021 1:18 PM
To: Prieto, Jeffrey <Prieto.Jeffrey@epa.gov>
Subject: RE: Hi Joe! Do you have a second to chat? My cell is +12028169041. Just chatted with the Administrator.

Thanks for the call.

Joseph Goffman
Principal Deputy Assistant Administrator Office of Air and Radiation U.S. Environmental Protection Agency

-----Original Message-----
From: Prieto, Jeffrey <Prieto.Jeffrey@epa.gov>
Sent: Sunday, November 21, 2021 12:27 PM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>
Subject: Hi Joe! Do you have a second to chat? My cell is Ex. 6 Personal Privacy (PP) Just chatted with the Administrator.

Sent from my iPhone

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

Argued October 8, 2020 Decided January 19, 2021

No. 19-1140

AMERICAN LUNG ASSOCIATION AND AMERICAN PUBLIC HEALTH ASSOCIATION,
PETITIONERS

v.

ENVIRONMENTAL PROTECTION AGENCY AND ANDREW WHEELER, ADMINISTRATOR,
RESPONDENTS

AEP GENERATING COMPANY, ET AL.,
INTERVENORS

Consolidated with 19-1165, 19-1166, 19-1173, 19-1175, 19-1176, 19-1177, 19-1179, 19-1185, 19-1186, 19-1187, 19-1188

On Petitions for Review of a Final Action of the Environmental Protection Agency

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Steven C. Wu, Deputy Solicitor General, Office of the Attorney General for the State of New York, argued the cause for the State and Municipal petitioners and intervenor Nevada.

With him on the briefs were *Letitia James*, Attorney General, *Barbara D. Underwood*, Solicitor General, *Matthew W. Grieco*, Assistant Solicitor General, *Michael J. Myers*, Senior Counsel, *Andrew G. Frank*, Assistant Attorney General of Counsel, *Xavier Becerra*, Attorney General, Office of the Attorney General for the State of California, *Robert W. Byrne*, Senior Assistant Attorney General, *David A. Zonana*, Supervising Deputy Attorney General, *Jonathan A. Wiener*, *M. Elaine Meckenstock*, *Timothy E. Sullivan*, *Elizabeth B. Rumsey*, and *Theodore A.B. McCombs*, Deputy Attorneys General, *William Tong*, Attorney General, Office of the Attorney General for the State of Connecticut, *Matthew I. Levine* and *Scott N. Koschwitz*, Assistant Attorneys General, *Kathleen Jennings*, Attorney General, Office of the Attorney General for the State of Delaware, *Valerie S. Edge*, Deputy Attorney General, *Philip J. Weiser*, Attorney General, Office of the Attorney General for the State of Colorado, *Eric R. Olson*, Solicitor General, *Robyn L. Wille*, Senior Assistant Attorney General, *Clare E. Connors*, Attorney General, Office of the Attorney General for the State of Hawaii, *William F. Cooper*, Deputy Attorney General, *Aaron M. Frey*, Attorney General, Office of the Attorney General for the State of Maine, *Laura E. Jensen*, Assistant Attorney General, *Brian E. Frosh*, Attorney General, Office of the Attorney General for the State of Maryland, *John B. Howard, Jr.*, *Joshua M. Segal*, and *Steven J. Goldstein*, Special Assistant Attorneys General, *Maura Healey*, Attorney General, Office of the Attorney General for the Commonwealth of Massachusetts, *Melissa A. Hoffer* and *Christophe Courchesne*, Assistant Attorneys General, *Megan M. Herzog* and *David S. Frankel*, Special Assistant Attorneys General, *Dana Nessel*, Attorney General, Office of the Attorney General for the State of Michigan, *Gillian E. Wener*, Assistant Attorney General, *Keith Ellison*, Attorney General, Office of the Attorney General for the State of Minnesota, *Peter N. Surdo*, Special Assistant Attorney

General, *Aaron D. Ford*, Attorney General, Office of the Attorney General for the State of Nevada, *Heidi Parry Stern*, Solicitor General, *Gurbir S. Grewal*, Attorney General, Office of the Attorney General for the State of New Jersey, *Lisa J. Morelli*, Deputy Attorney General, *Hector Balderas*, Attorney General, Office of the Attorney General for the State of New Mexico, *Tania Maestas*, Chief Deputy Attorney General, *Joshua H. Stein*, Attorney General, Office of the Attorney General for the State of North Carolina, *Asher Spiller*, Assistant Attorney General, *Ellen F. Rosenblum*, Attorney General, Office of the Attorney General for the State of Oregon, *Paul Garrahan*, Attorney-in-Charge, *Steve Novick*, Special Assistant Attorney General, *Josh Shapiro*, Attorney General, Office of the Attorney General for the Commonwealth of Pennsylvania, *Ann R. Johnston*, Senior Deputy Attorney General, *Aimee D. Thomson*, Deputy Attorney General, *Peter F. Neronha*, Attorney General, Office of the Attorney General for the State of Rhode Island, *Gregory S. Schultz*, Special Assistant Attorney General, *Thomas J. Donovan, Jr.*, Attorney General, Office of the Attorney General for the State of Vermont, *Nicholas F. Persampieri*, Assistant Attorney General, *Mark Herring*, Attorney General, Office of the Attorney General for the Commonwealth of Virginia, *Donald D. Anderson*, Deputy Attorney General, *Paul Kugelman, Jr.*, Senior Assistant Attorney General and Chief, Environmental Section, *Caitlin Colleen Graham O'Dwyer*, Assistant Attorney General, *Robert W. Ferguson*, Attorney General, Office of the Attorney General for the State of Washington, *Christopher H. Reitz* and *Emily C. Nelson*, Assistant Attorneys General, *Joshua L. Kaul*, Attorney General, Office of the Attorney General for the State of Wisconsin, *Gabe Johnson-Karp*, Assistant Attorney General, *Karl A. Racine*, Attorney General, Office of the Attorney General for the District of Columbia, *Loren L. AliKhan*, Solicitor General, *Tom Carr*, City Attorney, Office of the City

Attorney for the City of Boulder, *Debra S. Kalish*, Senior Counsel, *Mark A. Flessner*, Corporation Counsel, Office of the Corporation Counsel for the City of Chicago, *Benna Ruth Solomon*, Deputy Corporation Counsel, *Jared Policicchio*, Supervising Assistant Corporation Counsel, *Kristin M. Bronson*, City Attorney, Office of the City Attorney for the City and County of Denver, *Lindsay S. Carder* and *Edward J. Gorman*, Assistant City Attorneys, *Michael N. Feuer*, City Attorney, Office of the City Attorney for the City of Los Angeles, *Michael J. Bostrom*, Assistant City Attorney, *James E. Johnson*, Corporation Counsel, New York City Law Department, *Christopher G. King*, Senior Counsel, *Marcel S. Pratt*, City Solicitor, City of Philadelphia Law Department, *Scott J. Schwarz* and *Patrick K. O'Neill*, Divisional Deputy City Solicitors, and *Thomas F. Pepe*, City Attorney, City of South Miami. *Morgan A. Costello* and *Brian M. Lusignan*, Assistant Attorneys General, Office of the Attorney General for the State of New York, *Gavin G. McGabe*, Deputy Attorney General, *Anne Minard*, Special Assistant Attorney General, Office of the Attorney General for the State of New Mexico, *Cynthia M. Weisz*, Assistant Attorney General, Office of the Attorney General for the State of Maryland, entered appearances.

Kevin Poloncarz argued the cause for Power Company Petitioners. With him on the briefs were *Donald L. Ristow* and *Jake Levine.*

Mark W. DeLaquil argued the cause for Coal Industry Petitioners. With him on the briefs were *Shay Dvoretzky*, *Charles T. Wehland*, *Jeffery D. Ubersax*, *Robert D. Cheren*, and *Andrew Grossman.*

Theodore Hadzi-Antich argued the cause for Robinson Enterprises Petitioners. With him on the briefs were *Robert Henneke* and *Ryan D. Walters*.

Sean H. Donahue and Michael J. Myers argued the causes for Public Health and Environmental Petitioners. On the briefs were *Ann Brewster Weeks*, *James P. Duffy*, *Susannah L. Weaver*, *Joanne Spalding*, *Andres Restrepo*, *Vera Pardee*, *Clare Lakewood*, *Howard M. Crystal*, *Elizabeth Jones*, *Brittany E. Wright*, *Jon A. Mueller*, *David Doniger*, *Benjamin Longstreth*, *Melissa J. Lynch*, *Lucas May*, *Vickie L. Patton*, *Tomas Carbonell*, *Benjamin Levitan*, *Howard Learner*, and *Scott Strand*. *Alejandra Nunez* entered an appearance.

David M. Williamson argued the cause and filed the briefs for Biogenic Petitioners.

Gene Grace, *Jeff Dennis*, and *Rick Umoff* were on the brief for petitioners American Wind Energy Association, et al.

Theodore E. Lamm and *Sean B. Hecht* were on the brief for *amicus curiae* Thomas C. Jorling in support of petitioners.

Gabriel Pacyniak, *Brent Chapman*, and *Graciela Esquivel* were on the brief for *amici curiae* the Coalition to Protect America's National Parks and the National Parks Conservation Association in support of petitioners.

Deborah A. Sivas and *Matthew J. Sanders* were on the brief for *amici curiae* Administrative Law Professors in support of petitioners.

Hope M. Babcock was on the brief for *amici curiae* the American Thoracic Society, et al. in support of petitioners.

Richard L. Revesz and *Jack Lienke* were on the brief for *amicus curiae* the Institute for Policy Integrity at New York University School of Law in support of petitioners.

Steph Tai was on the brief for *amici curiae* Climate Scientists in support of petitioners.

Michael Burger and *Collyn Peddie* were on the brief for *amici curiae* the National League of Cities, et al. in support of petitioners.

Keri R. Steffes was on the brief for *amici curiae* Faith Organizations in support of petitioners.

Shaun A. Goho was on the brief for *amici curiae* Maximilian Auffhammer, et al. in support of petitioners.

Ethan G. Shenkman and *Stephen K. Wirth* were on the brief for *amici curiae* Patagonia Works and Columbia Sportswear Company in support of petitioners.

Mark Norman Templeton, *Robert Adam Weinstock*, *Alexander Valdes*, and *Benjamin Nickerson* were on the brief for *amicus curiae* Professor Michael Greenstone in support of petitioners.

Nicole G. Berner and *Renee M. Gerni* were on the brief for *amicus curiae* the Service Employees International Union in support of petitioners.

Elizabeth B. Wydra, and *Brianne J. Gorod* were on the brief for *amici curiae* Members of Congress in support of petitioners.

Jonas J. Monast was on the brief for *amici curiae* Energy Modelers in support of petitioners.

Katherine Konschnik was on the brief for *amici curiae* Former Commissioners of the Federal Energy Regulatory Commission in support of petitioners.

Michael Landis, *Elizabeth S. Merritt*, and *Wyatt G. Sassman* were on the brief for *amici curiae* Environment America and National Trust for Historic Preservation in support of petitioners.

Cara A. Horowitz was on the brief for *amici curiae* Grid Experts in support of petitioners.

Eric Alan Isaacson was on the brief for *amici curiae* U.S. Senators in support of petitioners.

Jonathan D. Brightbill, Principal Deputy Assistant Attorney General, U.S. Department of Justice, and *Meghan E. Greenfield* and *Benjamin Carlisle*, Attorneys, argued the causes for respondents. With them on the brief was *Jeffrey Bossert Clark*, Assistant Attorney General.

Lindsay S. See, Solicitor General, Office of the Attorney General for the State of West Virginia, argued the cause for State and Industry intervenors in support of respondents regarding Affordable Clean Energy Rule. With her on the brief were *Patrick Morrisey*, Attorney General, *Thomas T. Lampman*, Assistant Solicitors General, *Thomas A. Lorenzen*, *Elizabeth B. Dawson*, *Rae Cronmiller*, *Kevin G. Clarkson*, Attorney General at the time the brief was filed, Office of the Attorney General for the State of Alaska, *Clyde Sniffen Jr.*, Attorney General, *Leslie Rutledge*, Attorney General, Office of the Attorney General for the State of Arkansas, *Nicholas J.*

Bronni, Solicitor General, *Vincent M. Wagner*, Deputy Solicitor General, *Dylan L. Jacobs*, Assistant Solicitor General, *Steve Marshall*, Attorney General, Office of the Attorney General for the State of Alabama, *Edmund G. LaCour, Jr.*, Solicitor General, *Christopher M. Carr*, Attorney General, Office of the Attorney General for the State of Georgia, *Andrew A. Pinson*, Solicitor General, *Derek Schmidt*, Attorney General, Office of the Attorney General for the State of Kansas, *Jeffrey A. Chanay*, Chief Deputy Attorney General, *Curtis T. Hill, Jr.*, Attorney General, Office of the Attorney General of Indiana, *Thomas M. Fisher*, Solicitor General, *Andrew Beshear*, Governor, Office of the Governor for the Commonwealth of Kentucky, *S. Travis Mayo*, Chief Deputy General Counsel, *Taylor Payne*, Deputy General Counsel, *Joseph A. Newberg*, Deputy General Counsel and Deputy Executive Director, *Jeff Landry*, Attorney General, Office of the Attorney General for the State of Louisiana, *Elizabeth B. Murrill*, Solicitor General, *Harry J. Vorhoff*, Assistant Attorney General, *Eric S. Schmitt*, Attorney General, Office of the Attorney General for the State of Missouri, *D. John Sauer*, Solicitor General, *Julie Marie Blake*, Deputy Solicitor General, *Timothy C. Fox*, Attorney General at the time the brief was filed, Office of the Attorney General for the State of Montana, *Matthew T. Cochenour*, Deputy Solicitor General, *Wayne Stenehjem*, Attorney General, Office of the Attorney General for the State of North Dakota, *Paul M. Seby*, Special Assistant Attorney General, *Douglas J. Peterson*, Attorney General, Office of the Attorney General for the State of Nebraska, *Justin D. Lavene*, Assistant Attorney General, *Dave Yost*, Attorney General, Office of the Attorney General of the State of Ohio, *Benjamin M. Flowers*, Solicitor General, *Cameron F. Simmons*, Principal Assistant Attorney General, *Mike Hunter*, Attorney General, Office of the Attorney General for the State of Oklahoma, *Mithun Mansinghani*, Solicitor General, *Jason R. Ravnsborg*, Attorney General, Office of the Attorney

General for the State of South Dakota, *Steven R. Blair*, Assistant Attorney General, *Alan Wilson*, Attorney General, Office of the Attorney General for the State of South Carolina, *James Emory Smith, Jr.*, Deputy Solicitor General, *Ken Paxton*, Attorney General, Office of the Attorney General for the State of Texas, *Kyle D. Hawkins*, Solicitor General, *Sean Reyes*, Attorney General, Office of the Attorney General for the State of Utah, *Tyler R. Green*, Solicitor General, *Bridget Hill*, Attorney General, Office of the Attorney General for the State of Wyoming, *James Kaste*, Deputy Attorney General, *Todd E. Palmer*, *William D. Booth*, *Obianuju Okasi*, *Carroll W. McGuffey, III*, *Misha Tseytlin*, *C. Grady Moore, III*, *Julia Barber*, *F. William Brownell*, *Elbert Lin*, *Allison D. Wood*, *Scott A. Keller*, *Jeffrey H. Wood*, *Jeremy Evan Maltz*, *Steven P. Lehotsky*, *Michael B. Schon*, *Emily Church Schilling*, *Kristina R. Van Bockern*, *David M. Flannery*, *Kathy G. Beckett*, *Edward L. Kropp*, *Amy M. Smith*, *Janet J. Henry*, *Melissa Horne*, *Angela Jean Levin*, *Eugene M. Trisko*, *John A. Rego*, *Reed W. Sirak*, *Michael A. Zody*, *Jacob Santini*, *Robert D. Cheren*, *Mark W. DeLaquil*, and *Andrew M. Grossman. C. Frederick Beckner, III*, *James R. Bedell*, *Margaret C. Campbell*, *Erik D. Lange*, and *John D. Lazzaretti* entered an appearance.

James P. Duffy argued the cause for Public Health and Environmental Intervenors in support of respondents. With him on the brief were *Ann Brewster Weeks*, *Sean H. Donahue*, *Susannah L. Weaver*, *Joanne Spalding*, *Andres Restrepo*, *Vera Pardee*, *Clare Lakewood*, *Elizabeth Jones*, *Brittany E. Wright*, *Jon A. Mueller*, *David Doniger*, *Benjamin Longstreth*, *Melissa J. Lynch*, *Lucas May*, *Vickie L. Patton*, *Tomas Carbonell*, *Benjamin Levitan*, *Howard Learner*, and *Scott Strand*.

Letitia James, Attorney General, Office of the Attorney General for the State of New York, *Michael J. Myers*, Senior Counsel, *Brian Lusignan*, Assistant Attorney General of

Counsel, *Barbara D. Underwood*, Solicitor General, *Steven C. Wu*, Deputy Solicitor General, *Matthew W. Grieco*, Assistant Solicitor General, *Xavier Becerra*, Attorney General, Office of the Attorney General for the State of California, *Robert W. Byrne*, Senior Assistant Attorney General, *David A. Zonana*, Supervising Deputy Attorney General, *Jonathan A. Wiener*, *M. Elaine Meckenstock*, *Timothy E. Sullivan*, *Elizabeth B. Rumsey*, and *Theodore A.B. McCombs*, Deputy Attorneys General, *William Tong*, Attorney General, Office of the Attorney General for the State of Connecticut, *Matthew I. Levine* and *Scott N. Koschwitz*, Assistant Attorneys General, *Kathleen Jennings*, Attorney General, Office of the Attorney General for the State of Delaware, *Valerie S. Edge*, Deputy Attorney General, *Philip J. Weiser*, Attorney General, Office of the Attorney General for the State of Colorado, *Eric R. Olson*, Solicitor General, *Robyn L. Wille*, Senior Assistant Attorney General, *Clare E. Connors*, Attorney General, Office of the Attorney General for the State of Hawaii, *William F. Cooper*, Deputy Attorney General, *Aaron M. Frey*, Attorney General, Office of the Attorney General for the State of Maine, *Laura E. Jensen*, Assistant Attorney General, *Brian E. Frosh*, Attorney General, Office of the Attorney General for the State of Maryland, *John B. Howard, Jr.*, *Joshua M. Segal*, and *Steven J. Goldstein*, Special Assistant Attorneys General, *Maura Healey*, Attorney General, Office of the Attorney General for the Commonwealth of Massachusetts, *Melissa A. Hoffer* and *Christophe Courchesne*, Assistant Attorneys General, *Megan M. Herzog* and *David S. Frankel*, Special Assistant Attorneys General, *Dana Nessel*, Attorney General, Office of the Attorney General for the State of Michigan, *Gillian E. Wener*, Assistant Attorney General, *Keith Ellison*, Attorney General, Office of the Attorney General for the State of Minnesota, *Peter N. Surdo*, Special Assistant Attorney General, *Aaron D. Ford*, Attorney General, Office of the Attorney General for the State of Nevada, *Heidi Parry Stern*, Solicitor General, *Gurbir*

S. Grewal, Attorney General, Office of the Attorney General for the State of New Jersey, *Lisa J. Morelli*, Deputy Attorney General, *Hector Balderas*, Attorney General, Office of the Attorney General for the State of New Mexico, *Tania Maestas*, Chief Deputy Attorney General, *Joshua H. Stein*, Attorney General, Office of the Attorney General for the State of North Carolina, *Asher Spiller*, Assistant Attorney General, *Ellen F. Rosenblum*, Attorney General, Office of the Attorney General for the State of Oregon, *Paul Garrahan*, Attorney-in-Charge, *Steve Novick*, Special Assistant Attorney General, *Josh Shapiro*, Attorney General, Office of the Attorney General for the Commonwealth of Pennsylvania, *Ann R. Johnston*, Senior Deputy Attorney General, *Aimee D. Thomson*, Deputy Attorney General, *Peter F. Neronha*, Attorney General, Office of the Attorney General for the State of Rhode Island, *Gregory S. Schultz*, Special Assistant Attorney General, *Thomas J. Donovan, Jr.*, Attorney General, Office of the Attorney General for the State of Vermont, *Nicholas F. Persampieri*, Assistant Attorney General, *Mark Herring*, Attorney General, Office of the Attorney General for the Commonwealth of Virginia, *Donald D. Anderson*, Deputy Attorney General, *Paul Kugelman, Jr.*, Senior Assistant Attorney General and Chief, Environmental Section, *Caitlin Colleen Graham O'Dwyer*, Assistant Attorney General, *Robert W. Ferguson*, Attorney General, Office of the Attorney General for the State of Washington, *Christopher H. Reitz* and *Emily C. Nelson*, Assistant Attorneys General, *Karl A. Racine*, Attorney General, Office of the Attorney General for the District of Columbia, *Loren L. AliKhan*, Solicitor General, *Tom Carr*, City Attorney, Office of the City Attorney for the City of Boulder, *Debra S. Kalish*, Senior Counsel, *Mark A. Flessner*, Corporation Counsel, Office of the Corporation Counsel for the City of Chicago, *Benna Ruth Solomon*, Deputy Corporation Counsel, *Jared Policicchio*, Supervising Assistant Corporation Counsel, *Kristin M. Bronson*, City Attorney, Office of the City

Attorney for the City and County of Denver, *Lindsay S. Carder* and *Edward J. Gorman*, Assistant City Attorneys, *Michael N. Feuer*, City Attorney, Office of the City Attorney for the City of Los Angeles, *Michael J. Bostrom*, Assistant City Attorney, *James E. Johnson*, Corporation Counsel, New York City Law Department, *Christopher G. King*, Senior Counsel, *Marcel S. Pratt*, City Solicitor, City of Philadelphia Law Department, *Scott J. Schwarz* and *Patrick K. O'Neill*, Divisional Deputy City Solicitors, and *Thomas F. Pepe*, City Attorney, City of South Miami were on the brief for the State and Municipal Intervenors in support of respondents. *Jeremiah Langston*, Assistant Attorney General, Office of the Attorney General for the State of Montana, *Stephen C. Meredith*, Solicitor, Office of the Attorney General for the Commonwealth of Kentucky, *Margaret I. Olson*, Assistant Attorney General, Office of the Attorney General for the State of North Dakota, and *Erik E. Petersen*, Assistant Attorney General, Office of the Attorney General for the State of Wyoming, and *Robert A. Wolf* entered appearances.

Patrick Morrisey, Attorney General, Office of the Attorney General for the State of West Virginia, *Lindsay S. See*, Solicitor General, *Thomas T. Lampman*, Assistant Solicitor General, *Scott A. Keller*, *Jeffrey H. Wood*, *Jeremy Evan Maltz*, *Steven P. Lehotsky*, *Michael B. Schon*, *Thomas A. Lorenzen*, *Elizabeth B. Dawson*, *Rae Cronmiller*, *Steve Marshall*, Attorney General, Office of the Attorney General for the State of Alabama, *Edmund G. LaCour, Jr.*, Solicitor General, *Kevin G. Clarkson*, Attorney General, Office of the Attorney General for the State of Alaska at the time the brief was filed, *Clyde Sniffen, Jr.*, Attorney General, *Leslie Rutledge*, Attorney General, Office of the Attorney General for the State of Arkansas, *Nicholas J. Bronni*, Solicitor General, *Vincent M. Wagner*, Deputy Solicitor General, *Dylan L. Jacobs*, Assistant Solicitor General, *Christopher M. Carr*, Attorney General,

Office of the Attorney General for the State of Georgia, *Andrew A. Pinson*, Solicitor General, *Derek Schmidt*, Attorney General, Office of the Attorney General for the State of Kansas, *Jeffrey A. Chanay*, Chief Deputy Attorney General, *Curtis T. Hill, Jr.*, Attorney General, Office of the Attorney General of Indiana, *Thomas M. Fisher*, Solicitor General, *Andrew Beshear*, Governor, Office of the Governor for the Commonwealth of Kentucky, *S. Travis Mayo*, Chief Deputy General Counsel, *Taylor Payne*, Deputy General Counsel, *Joseph A. Newberg*, Deputy General Counsel and Deputy Executive Director, *Jeff Landry*, Attorney General, Office of the Attorney General for the State of Louisiana, *Elizabeth B. Murrill*, Solicitor General, *Harry J. Vorhoff*, Assistant Attorney General, *Eric S. Schmitt*, Attorney General, Office of the Attorney General for the State of Missouri, *D. John Sauer*, Solicitor General, *Julie Marie Blake*, Deputy Solicitor General, *Timothy C. Fox*, Attorney General at the time the brief was filed, Office of the Attorney General for the State of Montana, *Matthew T. Cochenour*, Deputy Solicitor General, *Wayne Stenehjem*, Attorney General, Office of the Attorney General for the State of North Dakota, *Paul M. Seby*, Special Assistant Attorney General, *Douglas J. Peterson*, Attorney General, Office of the Attorney General for the State of Nebraska, *Justin D. Lavene*, Assistant Attorney General, *Dave Yost*, Attorney General, Office of the Attorney General of the State of Ohio, *Benjamin M. Flowers*, Solicitor General, *Cameron F. Simmons*, Principal Assistant Attorney General, *Mike Hunter*, Attorney General, Office of the Attorney General for the State of Oklahoma, *Mithun Mansinghani*, Solicitor General, *Jason R. Ravnsborg*, Attorney General, Office of the Attorney General for the State of South Dakota, *Steven R. Blair*, Assistant Attorney General, *Alan Wilson*, Attorney General, Office of the Attorney General for the State of South Carolina, *James Emory Smith, Jr.*, Deputy Solicitor General, *Ken Paxton*, Attorney General, Office of the Attorney General for

the State of Texas, *Kyle D. Hawkins*, Solicitor General, *Sean Reyes*, Attorney General, Office of the Attorney General for the State of Utah, *Tyler R. Green*, Solicitor General, *Bridget Hill*, Attorney General, Office of the Attorney General for the State of Wyoming, *James Kaste*, Deputy Attorney General, *Todd E. Palmer*, *William D. Booth*, *Obianuju Okasi*, *Carroll W. McGuffey, III*, *Misha Tseytlin*, *C. Grady Moore, III*, *Julia Barber*, *F. William Brownell*, *Elbert Lin*, *Allison D. Wood*, *Emily Church Schilling*, *Kristina R. Van Bockern*, *David M. Flannery*, *Kathy G. Beckett*, *Edward L. Kropp*, *Amy M. Smith*, *Janet J. Henry*, *Melissa Horne*, *Angela Jean Levin*, *Eugene M. Trisko*, *John A. Rego*, *Reed W. Sirak*, *Michael A. Zody*, *Jacob Santini*, *Robert D. Cheren*, *Mark W. DeLaquil*, and *Andrew M. Grossman* were on the brief for State and Industry Intervenors in support of respondents regarding Clean Power Plan Repeal.

Wayne Stenehjem, Attorney General, Office of the Attorney General for the State of North Dakota, and *Paul M. Seby*, Special Assistant Attorney General, were on the brief for intervenor State of North Dakota in support of the respondents. *Jerry Stouck* entered an appearance.

Thomas J. Ward, *Megan H. Berge*, and *Jared R. Wigginton* were on the brief for *amicus curiae* National Association of Builders in support of respondents.

Before: MILLETT, PILLARD, and WALKER, *Circuit Judges*.

Opinion for the Court filed PER CURIAM.

Opinion concurring in part, concurring in the judgment in part, and dissenting in part filed by *Circuit Judge* WALKER.

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As the Supreme Court recognized nearly fourteen years ago, climate change has been called "the most pressing environmental challenge of our time." *Massachusetts v. EPA*, 549 U.S. 497, 505 (2007) (formatting modified). Soon thereafter, the United States government determined that greenhouse gas emissions are polluting our atmosphere and causing significant and harmful effects on the human environment. Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act (2009 Endangerment Finding), 74 Fed. Reg. 66,496, 66,497–66,499 (Dec. 15, 2009). And both Republican and Democratic administrations have agreed: Power plants burning fossil fuels like coal "are far and away" the largest stationary source of greenhouse gases and, indeed, their role in greenhouse gas emissions "dwarf[s] other categories[.]" EPA Br. 169; *see also* Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units (New Source Rule), 80 Fed. Reg. 64,510, 64,522 (Oct. 23, 2015) (fossil-fuel-fired power plants are "by far the largest emitters" of greenhouse gases).

The question in this case is whether the Environmental Protection Agency (EPA) acted lawfully in adopting the 2019 Affordable Clean Energy Rule (ACE Rule), 84 Fed. Reg. 32,520 (July 8, 2019), as a means of regulating power plants' emissions of greenhouse gases. It did not. Although the EPA has the legal authority to adopt rules regulating those emissions, the central operative terms of the ACE Rule and the repeal of its predecessor rule, the Clean Power Plan, 80 Fed. Reg. 64,662 (Oct. 23, 2015), hinged on a fundamental misconstruction of Section 7411(d) of the Clean Air Act. In addition, the ACE Rule's amendment of the regulatory framework to slow the process for reduction of emissions is arbitrary and capricious. For those reasons, the ACE Rule is

vacated, and the record is remanded to the EPA for further proceedings consistent with this opinion.

I. BACKGROUND

A. THE CLEAN AIR ACT

In 1963, Congress passed the Clean Air Act, 42 U.S.C. § 7401 *et seq.*, "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population[,]" *id.* § 7401(b)(1). Animating the Act was Congress' finding that "growth in the amount and complexity of air pollution brought about by urbanization, industrial development, and the increasing use of motor vehicles[] has resulted in mounting dangers to the public health and welfare[.]" *Id.* § 7401(a)(2).

Section 111 of the Clean Air Act, which was added in 1970 and codified at 42 U.S.C. § 7411, directs the EPA to regulate any new and existing stationary sources of air pollutants that "cause[], or contribute[] significantly to, air pollution" and that "may reasonably be anticipated to endanger public health or welfare." 42 U.S.C. § 7411(b)(1)(A); *see id.* § 7411(d), (f) (providing that the EPA Administrator "shall" regulate existing and new sources of air pollution). A "stationary source" is a source of air pollution that cannot move, such as a power plant. *See id.* § 7411(a)(3) (defining "stationary source" as "any building, structure, facility, or installation which emits or may emit any air pollutant[]"). An example of a common non-stationary source of air pollution is a gas-powered motor vehicle. *See Utility Air Regulatory Group v. EPA* (*UARG*), 573 U.S. 302, 308 (2014).

Within 90 days of the enactment of Section 7411, the EPA Administrator was to promulgate a list of stationary source categories that "cause[], or contribute[] significantly to, air

pollution[.]" 42 U.S.C. § 7411(b)(1)(A). In 1971, the Administrator included fossil-fuel-fired steam-generating power plants on that list. Air Pollution Prevention and Control: List of Categories of Stationary Sources, 36 Fed. Reg. 5,931 (March 31, 1971); *see also* New Source Rule, 80 Fed. Reg. at 64,527–64,528. Today's power plants fall in that same category. ACE Rule, 84 Fed. Reg. at 32,557 n.250.

Once a stationary source category is listed, the Administrator must promulgate federal "standards of performance" for all newly constructed sources in the category. 42 U.S.C. § 7411(b)(1)(B). The Act defines a "standard of performance" as

> a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.

Id. § 7411(a)(1).

Once such a new source regulation is promulgated, the Administrator also must issue emission guidelines for already-existing stationary sources within that same source category. 42 U.S.C. § 7411(d)(1)(A)(ii); *see also American Elec. Power Co., Inc. v. Connecticut* (*AEP*), 564 U.S. 410, 424 (2011).

While the new source standards are promulgated and enforced entirely by the EPA, the Clean Air Act prescribes a process of cooperative federalism for the regulation of existing sources. Under that structure, the statute delineates three distinct regulatory steps involving three sets of actors—the

EPA, the States, and regulated industry—each of which has a flexible role in choosing how to comply. *See* 42 U.S.C. § 7411(a)(1), (d). This allows each State to work with the stationary sources within its jurisdiction to devise a plan for meeting the federally promulgated quantitative guideline for emissions. *See id.* § 7411(d).

The process starts with the EPA first applying its expertise to determine "the degree of emission limitation achievable through the application of the best system of emission reduction" that "has been adequately demonstrated." 42 U.S.C. § 7411(a)(1); *see* 40 C.F.R. § 60.22a. That system must "tak[e] into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements[.]" 42 U.S.C. § 7411(a)(1). Once the Administrator identifies the best system of emission reduction, she then determines the amount of emission reduction that existing sources should be able to achieve based on the application of that system and adopts corresponding emission guidelines. *Id.*; *see also, e.g.*, ACE Rule, 84 Fed. Reg. at 32,523; Clean Power Plan, 80 Fed. Reg. at 64,719.

Each State then submits to the EPA a plan that (i) establishes standards of performance for that State's existing stationary sources' air pollutants (excepting pollutants already subject to separate federal emissions standards), and (ii) "provides for the implementation and enforcement of such standards of performance[]" by the State. 42 U.S.C. § 7411(d)(1); *see* 40 C.F.R. § 60.23a. The standards of performance must "reflect[]" the emission targets that the EPA has determined are achievable. 42 U.S.C. § 7411(a)(1). In this context, a state standard need not adopt the best system identified by the EPA to "reflect[]" it. *Id.*; *see* 40 C.F.R. § 60.24a(c). Instead, the Clean Air Act affords States significant flexibility in designing and enforcing standards that

employ other approaches so long as they meet the emission guidelines prescribed by the Agency.

If a State fails to submit a satisfactory plan, the EPA may prescribe a plan for that State. 42 U.S.C. § 7411(d)(2)(A); *see* 40 C.F.R. § 60.27a(c)-(e). Similarly, if the State submits a plan but fails to enforce it, the EPA itself may enforce the plan's terms. *Id.* § 7411(d)(2)(B).

The third and final set of relevant actors are the regulated entities themselves, to which, under the Act, the States may afford leeway in crafting compliance measures. *See* Clean Power Plan, 80 Fed. Reg. at 64,666; ACE Rule, 84 Fed. Reg. at 32,555.

The EPA has exercised its authority under Section 7411 over the years to set emission limitations for different types of air pollution from various categories of existing sources. *See* 42 Fed. Reg. 12,022 (March 1, 1977) (fluorides from phosphate fertilizer plants); 42 Fed. Reg. 55,796 (Oct. 18, 1977) (acid mist from sulfuric acid plants); 44 Fed. Reg. 29,828 (May 22, 1979) (total reduced sulfur from kraft pulp plants); 45 Fed. Reg. 26,294 (April 17, 1980) (fluorides from primary aluminum plants); 60 Fed. Reg. 65,387 (Dec. 19, 1995) (various pollutants from municipal waste combustors); 61 Fed. Reg. 9905 (March 12, 1996) (landfill gases from municipal solid waste landfills); 70 Fed. Reg. 28,606 (May 18, 2005) (mercury from coal-fired power plants).

The Clean Air Act is a comprehensive statute that includes a variety of regulatory programs for tackling air pollution in addition to Section 7411. Regulated parties may be subject to one or more programs. As relevant here, the National Ambient Air Quality Standards (NAAQS) provisions, 42 U.S.C. §§ 7408–7410, govern the levels of specified air pollutants that may be present in the atmosphere to protect air quality and the

public health and welfare. The Hazardous Air Pollutants program, *id.* § 7412, directs the EPA to establish strict emission limitations for the most dangerous air pollutants emitted from major sources. Section 7411's cooperative federalism program for existing sources operates as a gap-filler, requiring the EPA to regulate harmful emissions not controlled under those other two programs. *Id.* § 7411(d)(1)(i).

B. ELECTRICITY AND CLIMATE CHANGE

1. Electricity

Electricity powers the world. Chances are that you are reading this opinion on a device that consumes electricity. Yet two distinct characteristics of electricity make its production and delivery in the massive quantities demanded by consumers an exceptionally complex process. First, unlike most products, electricity is a perfectly fungible commodity. Grid Experts Amicus Br. 6. A watt of electricity is a watt of electricity, no matter who makes it, how they make it, or where it is purchased. Second, at least as of now, this highly demanded product cannot be effectively stored at scale after it is created. Paul L. Joskow, *Creating a Smarter U.S. Electricity Grid*, 26 J. ECON. PERSP. 29, 31–33 (2012).[1] Instead, electricity must

[1] Change in storage capacity is picking up speed. *See generally* Richard L. Revesz & Burcin Unel, *Managing the Future of the Electricity Grid: Energy Storage and Greenhouse Gas Emissions*, 42 HARV. ENV'T L. REV. 139, 140–141 (2018) (describing ongoing declines in cost of storage); LAZARD, LAZARD'S LEVELIZED COST OF STORAGE ANALYSIS—VERSION 6.0 (2020) (noting "storage costs have declined across most use cases and technologies, particularly for shorter-duration applications, in part driven by evolving preferences in the industry"). Nevertheless, the grid's production capacity still far exceeds its present storage capacity. Univ. of Mich.

constantly be produced, and is almost instantaneously consumed. *See* Clean Power Plan, 80 Fed. Reg. at 64,677, 64,692; Grid Experts Amicus Br. 8.

Those unique attributes led to the creation of the American electrical grid.[2] The grid has been called the "supreme engineering achievement of the 20th century," MASS. INST. OF TECH., THE FUTURE OF THE ELECTRIC GRID 1 (2011) (formatting modified), and it is an exceptionally complex, interconnected system. "[A]ny electricity that enters the grid immediately becomes a part of a vast pool of energy that is constantly moving[.]" *New York v. FERC*, 535 U.S. 1, 7 (2002). That means that units of electricity as delivered to the user are identical, no matter their source. On the grid, there is no coal-generated electricity or renewable-generated electricity; there is just electricity. *See* Clean Power Plan, 80 Fed. Reg. at 64,692; Grid Experts Amicus Br. 7–8. Also, because storing electricity for any length of time remains technically challenging and often costly, the components of the grid must operate as a perfectly calibrated machine to deliver the amount of electricity that all consumers across the United States need at the moment they need it. Grid Experts Amicus

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Ctr. for Sustainable Sys., U.S. GRID ENERGY STORAGE (Sept. 2020), http://css.umich.edu/sites/default/files/US%20Grid%20Energy%20Storage_CSS15-17_e2020.pdf (last visited Jan. 11, 2021) (United States has 1,100 gigawatts of installed generation capacity and just 23 gigawatts of storage capacity).

[2] Technically, "grids." There are three regional grids in the contiguous United States: Eastern, Western, and Texas. Grid Experts Amicus Br. 9; *see also* United States Dep't of Energy, *North American Electric Reliability Corporation Interconnections*, https://www.energy.gov/oe/downloads/north-american-electric-reliability-corporation-interconnections (last visited Jan. 11, 2021).

Br. 8, 10–11; *see also* 80 Fed. Reg. at 64,677. "If [someone] in Atlanta on the Georgia [leg of the] system turns on a light, every generator on Florida's system almost instantly is caused to produce some quantity of additional electric energy which serves to maintain the balance in the interconnected system[.]" *Federal Power Comm'n v. Florida Power & Light Co.*, 404 U.S. 453, 460 (1972) (citation omitted). "Like orchestra conductors signaling entrances and cut-offs, grid operators use automated systems to signal particular generators to dispatch more or less power to the grid as needed over the course of the day, thus ensuring that power pooled on the grid rises and falls to meet changing demand." Grid Experts Amicus Br. 11.

Most generators of electricity on the American grid create power by burning fossil fuels like coal, oil, and natural gas. *See* United States Energy Information Administration (EIA), *Frequently Asked Questions: What Is U.S. Electricity Generation by Energy Source?* (Nov. 2, 2020), https://www.eia.gov/tools/faqs/faq.php?id=427&t=3 (last visited Jan. 11, 2021) (fossil fuels represented 62.6 percent of electricity generation in 2019). Some of those power plants take a fossil fuel (usually coal) and burn it in a water boiler to make steam. Other power plants take a different fossil fuel (usually natural gas), mix it with highly compressed air, and ignite it to release a combination of super-hot gases. Either way, that steam or superheated mixture is piped into giant turbines that catch the gases and rotate at extreme speeds. Those turbines turn generators, which spin magnets within wire coils to produce electricity. EIA, *Electricity Explained* (Nov. 9, 2020), https://www.eia.gov/energyexplained/electricity/how-electricity-is-generated.php (last visited Jan 11, 2021).

2. Climate Change and the Federal Government

Electrical power has become virtually as indispensable to modern life as air itself. But electricity generation has come into conflict with air quality in ways that threaten human health and well-being when power generated by burning fossil fuels emits carbon dioxide and other polluting greenhouse gases into the air.

Since the late 1970s, the federal government has focused "serious attention" on the effects of carbon dioxide pollution on the climate. *Massachusetts v. EPA*, 549 U.S. at 507. In 1978, Congress adopted the National Climate Program Act, Pub. L. No. 95-367, 92 Stat. 601, which directed the President to study and devise an appropriate response to "man-induced climate processes and their implications[,]" *id.* § 3; *see Massachusetts v. EPA*, 549 U.S. at 507–508. In response, the National Academy of Sciences' National Research Council reported "no reason to doubt that climate changes will result" if "carbon dioxide continues to increase," and "[a] wait-and-see policy may mean waiting until it is too late." *Massachusetts v. EPA*, 549 U.S. at 508 (quoting CLIMATE RESEARCH BOARD, CARBON DIOXIDE & CLIMATE: A SCIENTIFIC ASSESSMENT, at viii (1979)).

In 1987, Congress passed the Global Climate Protection Act, which found that "manmade pollution[,]" including "the release of carbon dioxide, * * * may be producing a long-term and substantial increase in the average temperature on Earth[.]" Pub. L. No. 100-204, Title XI, §1102(1), 101 Stat. 1407, 1408 (codified at 15 U.S.C. § 2901 note). The Climate Protection Act directed the EPA to formulate a "coordinated national policy on global climate change." *Id.* § 1103(b), 101 Stat. at 1408; *see Massachusetts v. EPA*, 549 U.S. at 508.

It was not until the Supreme Court's 2007 decision in *Massachusetts v. EPA*, however, that the Court confirmed that carbon dioxide and other greenhouse gas emissions constituted "air pollutant[s]" covered by the Clean Air Act. *See* 549 U.S. at 528. The Supreme Court explained that the Clean Air Act's "sweeping definition of 'air pollutant' includes '*any* air pollution agent or combination of such agents, including *any* physical, chemical . . . substance or matter which is emitted into or otherwise enters the ambient air[.]'" *Id.* at 528–529 (quoting 42 U.S.C. § 7602(g)). The Act, the Supreme Court held, "is unambiguous" in that regard. *Id.* at 529. "On its face, the definition embraces all airborne compounds of whatever stripe, and underscores that intent through the repeated use of the word 'any.'" *Id.* And "[c]arbon dioxide" and other common greenhouse gases are "without a doubt" chemical substances that are "emitted into . . . the ambient air." *Id.* (quoting 42 U.S.C. § 7602(g)).

Given that statutory command, the Supreme Court ruled that the EPA "can avoid taking further action" to regulate such pollution "only if it determines that greenhouse gases do not contribute to climate change" or offers some reasonable explanation for not resolving that question. *Massachusetts v. EPA*, 549 U.S. at 533.

Taking up the mantle, the EPA in 2009 found "compelling[]" evidence that emissions of greenhouse gases are polluting the atmosphere and are endangering human health and welfare by causing significant damage to the environment. 2009 Endangerment Finding, 74 Fed. Reg. at 66,497; *see id.* ("[T]he Administrator finds that greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare. * * * The Administrator has determined that the body of scientific evidence compellingly supports this finding."); *id.* at 66,497–

66,499. The EPA concluded that "'compelling' evidence supported the 'attribution of observed climate change to anthropogenic' [that is, human-influenced] emissions of greenhouse gases[.]" *AEP*, 564 U.S. at 417 (quoting 74 Fed. Reg. at 66,518). The "[c]onsequent dangers of greenhouse gas emissions," the EPA determined, include

> increases in heat-related deaths; coastal inundation and erosion caused by melting icecaps and rising sea levels; more frequent and intense hurricanes, floods, and other "extreme weather events" that cause death and destroy infrastructure; drought due to reductions in mountain snowpack and shifting precipitation patterns; destruction of ecosystems supporting animals and plants; and potentially "significant disruptions" of food production.

Id. (quoting 74 Fed. Reg. at 66,524–66,535).

Not long thereafter, the Supreme Court ruled that the significant greenhouse gas pollution caused by fossil-fuel-fired power plants is subject to regulation under Section 7411 of the Clean Air Act. *AEP*, 564 U.S. at 424 (holding that Section 7411 "speaks directly to emissions of carbon dioxide from [fossil-fuel-fired] plants[]") (internal quotation marks omitted). The Court concluded that the EPA's expertise made it "best suited to serve as primary regulator of greenhouse gas emissions." *Id.* at 428.

In 2015, with the 2009 carbon dioxide endangerment finding continuing in effect, the EPA reaffirmed that greenhouse gases "endanger public health, now and in the future." New Source Rule, 80 Fed. Reg. at 64,518. The EPA explained that, "[b]y raising average temperatures, climate change increases the likelihood of heat waves, which are associated with increased deaths and illnesses[,]" particularly

among "[c]hildren, the elderly, and the poor[.]" *Id.* at 64,517. In addition, the EPA found that "[c]limate change impacts touch nearly every aspect of public welfare." *Id.* Among the "multiple threats caused by human emissions of [greenhouse gases]," the EPA pointed to climate changes that "are expected to place large areas of the country at serious risk of reduced water supplies, increased water pollution, and increased occurrence of extreme events such as floods and droughts." *Id.* The EPA "emphasize[d] the urgency of reducing [greenhouse gas] emissions due to * * * projections that show [greenhouse gas] concentrations climbing to ever-increasing levels in the absence of mitigation[,]" citing independent assessments finding that, "without a reduction in emissions, CO_2 concentrations by the end of the century would increase to levels that the Earth has not experienced for more than 30 million years." *Id.* at 64,518.

The federal government's consistent recognition of the danger to public health and welfare caused by climate change, and the signal contribution of greenhouse gas emissions from power plants to global warming, continues to the present. In 2018, President Trump's administration concluded that "Earth's climate is now changing faster than at any point in the history of modern civilization, primarily as a result of human activities." U.S. GLOBAL CHANGE RESEARCH PROGRAM, FOURTH NATIONAL CLIMATE ASSESSMENT, VOLUME II: IMPACTS, RISKS, AND ADAPTATION IN THE UNITED STATES (REPORT-IN-BRIEF) 24 (2018). The administration added that "the evidence of human-caused climate change is overwhelming and continues to strengthen," and "the impacts of climate change are intensifying across the country[.]" *Id.* at 26 (emphasis omitted). "Climate-related changes in weather patterns and associated changes in air, water, food, and the environment are affecting the health and well-being of the American people, causing injuries, illnesses, and death." *Id.* at

102. The administration's report concluded that urgent action is needed to mitigate these dangers because "[f]uture risks from climate change depend primarily on decisions made today." *Id.* at 13.

In preparing the ACE Rule, the EPA expressly acknowledged its continued adherence to the 2015 endangerment finding. 84 Fed. Reg. at 32,533 (The 2015 New Source Rule "continues to provide the requisite predicate for applicability of [Clean Air Act] section 111(d)."); *id.* at 32,557 n.250; *see also* Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guideline Implementing Regulations; Revisions to New Source Review Program: Proposed Rule, 83 Fed. Reg. 44,746, 44,751 (Aug. 31, 2018) (confirming that the 2015 New Source Rule "remains on the books[]"); EPA Br. 217.

That endangerment finding provided the essential factual foundation—and triggered a statutory mandate—for the EPA to regulate greenhouse gas emissions from both new and existing power plants. *See* New Source Rule, 80 Fed. Reg. at 64,527, 64,529–64,532; Clean Power Plan, 80 Fed. Reg. at 64,683–64,690; *see also* 42 U.S.C. §§ 7411(b)(1)(A)–(B) (duty to regulate new stationary sources that contribute significantly to dangerous pollution identified in endangerment finding), 7411(d)(1)(A)(ii) (duty to regulate existing stationary sources that would be regulated under § 7411(b) if they were new stationary sources). Recall, Section 7411(b)(1)(A) provides that the EPA Administrator "shall" regulate any category of sources that, "in his judgment * * * causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare." The EPA endangerment findings reflect such well-established risks.

C. THE CLEAN POWER PLAN

In the last decade, the EPA has heavily focused its regulation of greenhouse gases on the power sector because "power plants are far and away the largest stationary-category source of greenhouse gases[,]" and "power plants' contributions to CO_2 pollution * * * dwarf[] other categories[.]" EPA Br. 169.

In October 2015, the EPA issued greenhouse gas emission standards for new and modified power plants. *See* New Source Rule, 80 Fed. Reg. at 64,510. In so doing, the EPA found that, "[a]ll told, these fossil fuel-fired [power plants] emit almost one-third of all U.S. [greenhouse gas] emissions, and are responsible for almost three times as much as the emissions from the next ten stationary source categories combined." *Id.* at 64,531. That rule and finding remain in effect and are not challenged in this litigation.

The EPA then turned to the regulation of existing power plants. The EPA began, as the Clean Air Act requires, by determining the best system of emission reduction that has been adequately demonstrated for existing fossil-fuel-fired power plants. *See* 42 U.S.C. § 7411(a)(1); Clean Power Plan, 80 Fed. Reg. at 64,718. In identifying that system, the EPA chose to build on the established grid system and methods of operation already adopted by and familiar to the power sector. *See* 80 Fed. Reg. at 64,725, 64,727–64,728. The regulations and standards that the EPA formulated came to be known as the Clean Power Plan. *Id.* at 64,663.

In the Clean Power Plan, the EPA determined that a combination of three existing methods of emission reduction—which the Plan referred to as building blocks, 80 Fed. Reg. at 64,667—formed the "best system of emission reduction," 42 U.S.C. § 7411(a)(1).

First, the system incorporated heat-rate improvements—that is, technological measures that improve efficiency at coal-fired steam power plants and, in that way, reduce the amount of coal that must be burned to produce each watt of electricity to the grid. 80 Fed. Reg. at 64,667.

Second, the system added the "substitut[ion of] increased generation from lower-emitting existing natural gas combined cycle units for generation from higher-emitting affected steam generating" power plants, which are mostly coal-fired. 80 Fed. Reg. at 64,667.

Third, the system prioritized the use of electricity generated from zero-emitting renewable-energy sources over electricity from the heavily greenhouse-gas-polluting fossil-fuel-fired power plants. 80 Fed. Reg. at 64,667.

Those second and third methods of emission control are often referred to as "generation shifting" because the reductions occur when the source of power generation shifts from higher-emission power plants to less-polluting sources of energy. *See* Clean Power Plan, 80 Fed. Reg. at 64,728–64,729. As the EPA observed, such shifts in generation already occur all the time as a matter of grid mechanics. That is, within the grid's "Constrained Least-Cost Dispatch" system, production from "generators with the lowest variable costs" will be dispatched "first, as system operational limits allow, until all demand is satisfied." Grid Experts Amicus Br. 12. "[R]enewable energy generators typically receive dispatch priority because they have lower variable costs than fossil-fuel-fired generators, which must purchase fuel." *Id.* at 13 (citing 80 Fed. Reg. at 64,693). The EPA found that most electricity is generated by diversified utilities that could achieve most or all of the shift to lower- or no-emission generation by

reassessing the dispatch priority of their own assets. *See* 80 Fed. Reg. at 64,796, 64,804.

As required by Section 7411(a)(1), the EPA then quantified the degree of emission reduction achievable under that three-tier best system for the relevant fossil-fuel-fired power plants and translated it into state-specific emissions goals for 2030. Clean Power Plan, 80 Fed. Reg. at 64,824–64,825. To permit additional flexibility, the Plan actually provided two alternative types of targets: rate-based goals, reflecting the rate of emission per certain amount of generation, and mass-based goals, reflecting the total emission from a State's sources. *Id.* at 64,820, 64,824–64,825 Tables 12, 13. The alternative metrics were an added source of flexibility for States in choosing how they would meet the federal limits.

Under the Clean Air Act, States could then propose plans that set standards of performance for their existing power plants that would meet those emission goals. Clean Power Plan, 80 Fed. Reg. at 64,664. In doing so, the States and their power plants were under no obligation to use the three specific methods that the EPA had identified in determining the best system of emission reduction. Rather, consistent with Section 7411(d)'s cooperative federalism approach, States were free to choose any measures, approaches, or technologies that they deemed appropriate to meet the federal guidelines. For example, they could adopt technological controls already in use by some power plants like carbon capture and sequestration (by which carbon dioxide is captured from the plant's flue gas before it is emitted and then securely stored so it cannot reach the atmosphere) or co-firing (where fuels that release less carbon dioxide are burned alongside fuels that release more to reduce the amount of the latter used). *See id.* at 64,883. The EPA also suggested that States might rely on emissions-trading

programs (often referred to as cap-and-trade) and other potential compliance strategies. *Id.* at 64,887.

The EPA found that its proposed approach was "consistent with, and in some ways mirrors, the interconnected, interdependent and highly regulated nature of the utility power sector[]" and its grid, as well as "the daily operation of affected [power plants] within this framework, and the critical role of utilities in providing reliable, affordable electricity at all times and in all places within this complex, regulated system." Clean Power Plan, 80 Fed. Reg. at 64,678.

The Clean Power Plan was challenged in this court. *West Virginia* v. *EPA,* No. 15-1363 (and consolidated cases) (D.C. Cir. Oct. 23, 2015). After we heard argument *en banc*, but before we issued a decision, that litigation was held in abeyance and ultimately dismissed as the EPA reassessed its position. No. 15-1363, Docs. 1673071, 1806952.

D. THE ACE RULE

In 2019, the EPA issued a new rule that repealed and replaced the Clean Power Plan: The Affordable Clean Energy (ACE) Rule. *See* Repeal of the Clean Power Plan; Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guidelines Implementing Regulations, 84 Fed. Reg. 32,520 (July 8, 2019). That Rule is the subject of this litigation.

1. Repeal of the Clean Power Plan

At the outset, the ACE Rule repealed the Clean Power Plan. The EPA explained that it felt itself statutorily compelled to do so because, in its view, "the plain meaning" of Section 7411(d) "unambiguously" limits the best system of emission reduction to only those measures "that can be put into operation

at a building, structure, facility, or installation." ACE Rule, 84 Fed. Reg. at 32,523–32,524. Because the Clean Power Plan's best system was determined by using some emission control measures that the EPA characterized as physically operating off the site of coal-fired power plants—such as some forms of generation shifting and emissions trading—the EPA concluded that it had no choice but to repeal the Plan. *Id.* The EPA emphasized "that [its] action is based on the only permissible reading of the statute and [it] would reach that conclusion even without consideration of the major question doctrine," while adding that application of that latter doctrine "confirms the unambiguously expressed intent" of Section 7411. *Id.* at 32,529.

2. Best System of Emission Reduction

Considering its authority under Section 7411 to be confined to physical changes to the power plants themselves, the EPA's ACE Rule determined a new best system of emission reduction for coal-fired power plants only. The EPA left unaddressed in this rulemaking (or elsewhere) greenhouse gas emissions from other types of fossil-fuel-fired power plants, such as those fired by natural gas or oil. ACE Rule, 84 Fed. Reg. at 32,533.

The EPA's proposed system relied solely on heat-rate improvement technologies and practices that could be applied at and to existing coal-fired power plants. ACE Rule, 84 Fed. Reg. at 32,525, 32,537. The EPA selected only seven heat-rate improvement techniques as components of its best system. *Id.* at 32,537. Six of those measures were new-to-the-plant technologies or "equipment upgrades." *Id.* at 32,536–32,537 (naming as part of the best system (1) adding or upgrading neural networks and intelligent sootblowers; (2) upgrading boiler feed pumps; (3) replacing or upgrading air heater and

duct leakage control devices; (4) adding variable frequency drives in feed pumps and induced-draft fans; (5) blade path upgrades; and (6) redesigning or replacing economizers). The seventh measure was the use of "best operating and maintenance practices" implementing heat-rate improvement techniques. *Id.* at 32,537, 32,540. The EPA limited itself to techniques that could be "applied broadly" to the Nation's coal-fired plants, which primarily amounted to upgrades to existing equipment. *Id.* at 32,536.

The EPA explained that only five of the seven listed techniques directly reduce the heat rate of power plants. *See* ACE Rule, 84 Fed. Reg. at 32,538–32,540. The other two techniques—replacing or upgrading the boiler feed pump and installing variable frequency drives—serve to reduce the amount of energy that a power plant must use to run its own general operations. *Id.* at 32,538–32,539.[3] So those two techniques do not make a power plant more efficient in turning coal into power, but instead allow power plants to dispatch more of the power they produce to the grid rather than using it internally. *Id.*

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[3] The boiler feed pump is a device that is used to pump water into the boiler. 84 Fed. Reg. at 32,538. It consumes a "large fraction" of the power used to run the plant. *Id.* Because the boiler feed pump requires so much energy, the EPA suggested that "maintenance on these pumps should be rigorous to ensure both reliability and high-efficiency operation." *Id.* Variable frequency drives "enable[] very precise and accurate speed control" of both boiler feed pumps and "induced draft (ID) fans," which "maintain proper flue gas flow through downstream air pollutant control equipment[.]" *Id.* at 32,539. This precise control would reduce the excess use of fans and pumps, requiring less energy. *See id.*

The EPA identified two of its other chosen techniques—blade path and economizer upgrades—as the measures that, of all the considered technologies, were "expected to offer some of the largest [heat-rate] improvements." ACE Rule, 84 Fed. Reg. at 32,537 (showing table predicting highest heat-rate improvement range in economizer redesign or replacements and blade path upgrades).[4]

But the EPA then stated that it expected some power plants would not adopt those two technologies because their use could trigger additional regulation that the companies would find burdensome. 84 Fed. Reg. at 32,537 ("[B]ased on public comments * * *, [blade path upgrades and economizer redesign or replacement] are [heat-rate improvement] technologies that have the most potential to trigger [New Source Review] requirements."). In fact, the EPA did not model those two techniques in its regulatory impact analysis precisely because it was unlikely that they would be adopted. J.A. 1656–1657.

Finally, the EPA acknowledged that the proposed technologies could create a "rebound effect." ACE Rule, 84 Fed. Reg. at 32,542. A rebound effect means that net carbon dioxide emissions actually *increase* as a result of the efficiency improvements made by power plants. *Id.* This happens because, as the efficiency upgrades make coal-based energy cheaper to produce, coal-fired power plants will have an incentive to run more often, thereby increasing their overall emissions. *Id.* The EPA found that risk of increased emissions irrelevant because its best system of emission reduction "is aimed at improving a source's emissions *rate* performance at

[4] "Blade path upgrades" consist of upgrades to the steam turbine. Economizers are heat-exchange devices that "capture waste heat from boiler flue gas" and use that captured heat to help heat the boiler feedwater. *Id.* at 32,540.

the unit-level," rather than reducing the overall volume of emissions by individual sources. *Id.* at 32,543.

In choosing its seven proposed power-plant-based heat-rate improvement technologies, the EPA excluded from its best system several other suggested methods of reducing emissions, including (1) natural gas co-firing, repowering, and refueling; (2) biomass co-firing; and (3) carbon capture and storage technologies. ACE Rule, 84 Fed. Reg. at 32,543–32,547. The EPA rejected biomass co-firing primarily because "any potential net reductions in emissions from biomass use occur outside of the regulated source," and so do not fall within the EPA's reading of Section 7411(d) as confined to emission limits imposed at and to individual plants. *Id.* at 32,546. The EPA excluded natural gas co-firing and carbon capture and storage from its own best system, citing cost, geographical, and operational concerns. *Id.* at 32,544–32,545, 32,547–32,548. The EPA provided that sources could choose to use natural gas co-firing or carbon capture—but not biomass co-firing—to meet state-established standards of performance. *Id.* at 32,555.

3. Degree of Emission Limitation Achievable

Having determined its best system of emission reduction, the EPA then purported to prescribe the "degree of emission limitation achievable," which States could use to create their own standards of performance. 42 U.S.C. § 7411(a)(1). What the EPA produced as its emission guidelines was a chart that prescribed heat-rate improvement "ranges" for each of the EPA's chosen heat-rate improvement technologies, organized by power plants of differing sizes. ACE Rule, 84 Fed. Reg. at 32,537. The ranges show how much heat-rate improvement can be "expected" from use of each of the identified technologies. *Id.*

The EPA was explicit, though, that the "potential" range of heat-rate reduction was only illustrative and that the actual reduction for each of the EPA's chosen technologies would be "unit-specific" and would "depend upon a range of unit-specific factors." ACE Rule, 84 Fed. Reg. at 32,537–32,538. In that way, the ACE Rule made States responsible for evaluating "[heat-rate improvement] potential, technical feasibility, and applicability for each of the [best system of emission reduction] candidate technologies" on a power-plant–by–power-plant basis. *Id.* at 32,538. The ACE Rule expressly left States free to establish their own standards of performance for their power plants that "reflect a value of [heat-rate improvement] that falls *outside*" the ranges provided in the EPA's chart. *Id.* (emphasis added). In other words, the minimums listed in the EPA's emission-reduction chart were only suggestions.

The EPA explained that its non-mandatory ranges of efficiency reduction were valid because the applicability of the heat-rate improvement techniques to different plants and the effectiveness of each power plant's existing technology may vary. *See* ACE Rule, 84 Fed. Reg. at 32,538 (stating that "not all" of the technologies would be "applicable or warranted at the level of a particular facility due to source-specific factors such as the site-specific operational and maintenance history, the design and configuration, [or] the expected operating plans").

The EPA predicted that its ACE Rule would reduce carbon dioxide emissions by less than 1% from baseline emission projections by 2035. J.A. 1651. That calculation did not reflect emission *increases* that could result from the rebound effect.

4. Implementing Regulations

The ACE Rule included some new regulations under Section 7411(d). ACE Rule, 84 Fed. Reg. at 32,575-32,584 (codified at 40 C.F.R. pt. 60, subpart Ba). As relevant here, the regulations significantly extend the States' deadlines for the development and submittal of their plans for emission reduction from nine months to three years. *See* 40 C.F.R. § 60.23a(a)(1). Similarly, the new regulations extend the EPA's deadline to act on those plans from four months to one year. 40 C.F.R. § 60.27a(b). The new regulations also extend the EPA's deadline to substitute its own plan for a non-compliant State's plan from six months after the submission deadline to two years after a finding that the plan was incomplete, disapproved, or unsubmitted. *See* 40 C.F.R. § 60.27a(c). Finally, the requirement that States demonstrate compliance progress is now triggered only where a State's compliance schedule stretches more than two years from when its plan was originally due, as opposed to the one-year period in the prior regulations. *See* 40 C.F.R. § 60.24a(d).

E. Petitions for Review

Twelve petitions for review of the ACE Rule were timely filed in this court and consolidated in this case. Nos. 19-1140 (lead case), 19-1165, 19-1166, 19-1173, 19-1175, 19-1176, 19-1177, 19-1179, 19-1185, 19-1186, 19-1187, 19-1188. The petitioners fall into three groups.

The first grouping consists of petitioners who seek review of the ACE Rule's conclusion that Section 7411 only permits emission reduction measures that can be implemented at and applied to the source. Those petitioners include (i) a coalition of State and municipal governments; (ii) power utilities;

(iii) trade associations from the renewable energy industry; and (iv) several public health and environmental advocacy groups.[5]

The second grouping is petitioners who challenge the ACE Rule's imposition of any emission limits as unlawful because, in their view, (i) the EPA failed to make a specific endangerment finding for carbon dioxide emitted from existing power plants; (ii) the EPA's regulation of mercury emissions from coal-fired power plants under Section 7412 precludes the regulation of greenhouse gas emissions under Section 7411; and (iii) the EPA should have regulated carbon dioxide from stationary sources, including power plants, under the NAAQS program, 42 U.S.C. §§ 7408–7410.

The third petitioner group is the Biogenic CO_2 Coalition. They object only to the ACE Rule's determination that States may not count biomass co-firing as a method of complying with numerical emission limits.

F. Jurisdiction and Standard of Review

This court has jurisdiction to review these petitions under the Clean Air Act. 42 U.S.C. § 7607(b)(1); *see also Sierra Club v. EPA*, 955 F.3d 56, 61 (D.C. Cir. 2020).

We may set aside the ACE Rule if it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 42 U.S.C. § 7607(d)(1)(C), (d)(9)(A); *see also Maryland v. EPA*, 958 F.3d 1185, 1196 (D.C. Cir. 2020) ("[W]e apply the same standard of review under the Clean Air Act as we do under the Administrative

[5] The public health and environmental advocacy groups also challenge the third prong of the ACE Rule—the new implementing regulations—as arbitrary and capricious.

Procedure Act.") (quoting *Allied Local & Reg'l Mfrs. Caucus v. EPA*, 215 F.3d 61, 68 (D.C. Cir. 2000)).

II. SECTION 7411

A. STATUTORY CONTEXT

In enacting the Clean Air Act, "Congress delegated to EPA the decision whether and how to regulate carbon-dioxide emissions from powerplants." *American Elec. Power Co. v. Connecticut* (*AEP*), 564 U.S. 410, 426 (2011). As the Supreme Court has observed, 42 U.S.C. § 7411 "speaks directly to" and outlines the framework for that regulation. *Id.* at 424 (internal quotation marks omitted). Specifically, Section 7411 marks out a pair of distinct regulatory tracks for stationary sources of air pollutants. *See* 42 U.S.C. § 7411(a)(2), (6). The first track applies to new sources, *id.* § 7411(b), and the second to existing sources, *id.* § 7411(d). The statute calls for federal-state cooperation in regulating existing sources, affording distinct roles to the federal and state agencies in arriving at what Section 7411 calls "standards of performance" for the emission of air pollutants. *Id.* § 7411(a)(1), (c), (d)(1).

The regulatory regimes for new and existing sources differ in the process by which such standards are established—and the roles played by the respective regulatory actors. The Act assigns the EPA the main regulatory role in specifying the new-source pollution controls: After the EPA determines that a particular "category of sources * * * causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare," it publishes regulations establishing standards of performance for new sources in that category. *Id.* § 7411(b)(1).

The process for regulating existing sources—which raise distinct concerns about sunk costs and the health and

environmental effects of older processes—involves more actors and steps. Regulation of a given category of existing sources is triggered by the same EPA air-pollution determination as for new sources. But for existing sources the Act adopts a cooperative-federalism approach that leaves the States discretion in determining how their State and industry can best meet quantitative emissions guidelines established by the EPA. *See AEP*, 564 U.S. at 424. Under Section 7411(d), the EPA and the States thus have distinct but complementary roles subject to different procedures and limitations. *See* 42 U.S.C. § 7411 (a)(1), (d)(1). This case concerns the mechanics of that cooperative framework for existing sources and, specifically, restrictions the Agency now claims the statute imposes on regulation of the air pollutants those sources emit.

Two provisions of Section 7411 shape the existing-source framework. Subsection (a)(1) defines a standard of performance, by reference to the "degree of emission limitation" that the EPA determines is "achievable," as:

> a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.

42 U.S.C. § 7411(a)(1).

Subsection (d)(1), in turn, requires the Secretary to set up a system by which willing States can submit to the EPA "a plan which [] establishes standards of performance for any existing source." *Id.* § 7411(d)(1). Only "where [a] State fails to submit a satisfactory plan" may the EPA step in and directly

promulgate standards of performance for existing sources. *Id.* § 7411(d)(2).

Putting these two provisions together results in what are best understood as three distinct steps involving three sets of actors, each exercising a degree of leeway in choice of control measures. *See* ACE Rule, 84 Fed. Reg. at 32,533, 32,549–32,550; Clean Power Plan, 80 Fed. Reg. at 64,665–64,666.

First, under subsection (a)(1), the EPA determines the "best system of emission reduction" that is "adequately demonstrated," taking into consideration certain enumerated statutory criteria: cost, any nonair quality health and environmental impacts, and energy requirements. 42 U.S.C. § 7411(a)(1). The Agency then issues emission guidelines that quantify the "degree of emission limitation achievable through the application of the best system" it has identified. *Id.*; 40 C.F.R. § 60.22a; *see AEP*, 564 U.S. at 424; EPA Br. 21–22; ACE Rule, 84 Fed. Reg. at 32,523, 32,551.

Second, under subsection (d)(1), States issue standards of performance for existing sources that comply with the EPA's emission guidelines and "reflect" the achievable degree of emission limitation set in those guidelines. *AEP*, 564 U.S. at 424; 42 U.S.C. § 7411(d)(1); 40 C.F.R. § 60.23a; *see also* Clean Power Plan, 80 Fed. Reg. at 64,666. That the standards must "reflect" the emission guidelines does not mean that they must embody the methods EPA contemplated in identifying the best system; rather, the States have flexibility in determining the specifics of the standards they issue so long as they accomplish the "degree of emission limitation" the EPA calculated based on its "best system."

Third, the operators of regulated stationary sources implement measures to ensure they will in practice comply with the standards of performance their state agency has

established for them. *See* ACE Rule, 84 Fed. Reg. at 32,555. States often grant regulated entities some discretion in how they meet those standards. *See, e.g.*, N.Y. COMP. CODES R. & REGS. Tit. 6 § 201-6.4(f) (2013) (describing the "operational flexibility" afforded to Title V facility owners in New York State to "propose a range of operating conditions that will allow flexibility [for a facility] to operate under more than one operating scenario").

The issue before us arises at the first step—the EPA's determination of the best system of emission reduction. In the Clean Power Plan, the Agency determined that the best system was one that both improved the heat rate at power plants and prioritized generation from lower-emitting plants ahead of high-emitting plants. Clean Power Plan, 80 Fed. Reg. at 64,707. The EPA then calculated specific emission reductions achievable through application of that best system that it published as emission guidelines for States. *Id.* Had the Clean Power Plan gone into effect, States would then have submitted to the EPA plans based on the Agency's guidelines that established standards of performance for sources in their jurisdictions, as provided for in subsection (d)(1). The Clean Power Plan left States flexibility in the measures they included in their plans, so long as they achieved a reduction in emissions at least as great as that achieved by EPA-established quantitative guidelines. *See, e.g.*, *id.* at 64,665, 64,756–64,757, 64,734–64,737, 64,832–64,837. And it further allowed States, at their option, to give leeway to sources to select alternate compliance measures to make the requisite reductions. *See id.* at 64,834–64,835.

Based on what it now perceives to be an express and unambiguous textual limitation in Section 7411 that it says the Clean Power Plan overlooked, the EPA repealed that Plan and replaced it with the ACE Rule. The EPA's new reading of the

statute requires the Agency, in modeling its "best system of emission reduction," to consider only emission-reduction measures that "can be applied at and to a stationary source." ACE Rule, 84 Fed. Reg. at 32,534; *see also id.* at 32,526–32,532.

We address below the EPA's arguments regarding how the text and structure of Section 7411 purportedly support this limitation. That discussion is necessarily somewhat abstract and technical. So, for starters, it is worth bringing the matter more concretely into view.

Consider the effect the EPA's new statutory interpretation had on its resulting Rule. First, because generation shifting is not, in the EPA's view, a measure that can be applied "at and to" any one individual source, the ACE Rule limits the best system of emission reduction to heat-rate improvements alone. 84 Fed. Reg. at 32,534–32,535. Then, instead of publishing emission guidelines quantifying emission reductions achievable through application of the best system, the ACE Rule identifies what the Agency has determined are the most effective heat-rate technologies available and a potential range of heat-rate improvements achievable through application of each of those technologies. *Id.* 32,535–32,537.

As under the Clean Power Plan, the ACE Rule grants States flexibility in establishing standards of performance for sources pursuant to the Agency's emission guidelines. Unlike the Clean Power Plan, however, the ACE Rule does not require that the States reach any specified minimum emission reduction. Instead, States must merely "evaluate the applicability of each of the candidate technologies" to sources within their jurisdiction and report their conclusions back to the Agency. ACE Rule, 84 Fed. Reg. at 32,550, 32,538–32,561.

The Rule recites that regulated entities have "broad

discretion" in meeting state-established standards, ACE Rule, 84 Fed. Reg. at 32,555, yet at the same time the Rule deems impermissible any compliance measure that cannot be applied at and to the source, *id.* The ACE Rule thereby disqualifies compliance by, for example, burning biofuel, *id.* at 32,557–32,558, which emits recently captured carbon dioxide, in contrast to fossil fuels' release of carbon dioxide stored away millions of years ago. *See generally Center for Biological Diversity v. EPA*, 722 F.3d 401, 405–406 (D.C. Cir. 2013).

The question here is a relatively discrete one. We are not called upon to decide whether the approach of the ACE Rule is a permissible reading of the statute as a matter of agency discretion. Instead, the sole ground on which the EPA defends its abandonment of the Clean Power Plan in favor of the ACE Rule is that the text of Section 7411 is clear and unambiguous in constraining the EPA to use only improvements at and to existing sources in its best system of emission reduction.

The EPA contends that its current interpretation is "the only permissible interpretation of the scope of the EPA's authority." ACE Rule, 84 Fed. Reg. at 32,535. Our task is to assess whether Section 7411 in fact compels the EPA's new interpretation. And because "deference to an agency's interpretation of a statute is not appropriate when the agency wrongly believes that interpretation is compelled by Congress," *Peter Pan Bus Lines, Inc. v. Fed. Motor Carrier Safety Admin.*, 471 F.3d 1350, 1354 (D.C. Cir. 2006) (quoting *PDK Labs., Inc. v. DEA*, 362 F.3d 786, 798 (D.C. Cir. 2004) (internal quotation marks omitted)), we may not defer to the EPA's reading if it is but one of several permissible interpretations of the statutory language, *see Negusie v. Holder*, 555 U.S. 511, 521 (2009). That is, the "regulation must be declared invalid, even though the agency might be able to adopt the regulation in the exercise of its discretion, if it 'was not

based on the agency's own judgment but rather on the unjustified assumption that it was Congress' judgment that such a regulation is desirable" or required. *Prill v. NLRB*, 755 F.2d 941, 948 (D.C. Cir. 1985) (quoting *FCC v. RCA Commc'ns*, 346 U.S. 86, 96 (1953) (formatting modified)); *accord Arizona v. Thompson*, 281 F.3d 248, 259 (D.C. Cir. 2002) (quoting *Prill*, 755 F.2d at 948).

For the reasons explained below, Section 7411 does not, as the EPA claims, constrain the Agency to identifying a best system of emission reduction consisting only of controls "that can be applied at and to a stationary source." ACE Rule, 84 Fed. Reg. at 32,534. The EPA here "failed to rely on its own judgment and expertise, and instead based its decision on an erroneous view of the law." *Prill*, 755 F.2d at 956. We accordingly must vacate and remand to the Agency "to interpret the statutory language anew." *Peter Pan Bus Lines*, 471 F.3d at 1354.

1. Text

As just noted, Section 7411 contemplates distinct roles for the EPA and the States in regulating existing stationary sources. *See* 42 U.S.C. § 7411(a)(1) (granting authority to the EPA to designate the best system and determine achievable degree of emissions reduction); *id.* § 7411(d)(1) (outlining the States' role in setting standards of performance for their sources). Nevertheless, the EPA now contends that language in Section 7411(a)(1) and (d)(1) "unambiguously limits the [best system of emission reduction] to those systems that can be put into operation *at* a building, structure, facility, or installation." ACE Rule, 84 Fed. Reg. at 32,524 (emphasis in original); *see id.* at 32,528; EPA Br. 70.

In the Agency's current view, the only pollution-control methods the Administrator can consider in selecting the "best

system of emission reduction" within the meaning of Section 7411(a) are add-ons or retrofits confined to the level of the individual fossil-fuel-fired power plant. ACE Rule, 84 Fed. Reg. at 32,524. That is so even though the record before the EPA shows that generation shifting to prioritize use of the cleanest sources of power is one of the most cost-effective means of reducing emissions that plants have already adopted and that have been demonstrated to work, and that generation shifting is capable of achieving far more emission reduction than controls physically confined to the source. *See, e.g.*, Clean Power Plan, 80 Fed. Reg. at 64,693, 64,728–64,729; 2 J.A. 598; Grid Experts Amicus Br. 13–16. In other words, the EPA reads the statute to require the Agency to turn its back on major elements of the systems that the power sector is actually and successfully using to efficiently and cost-effectively achieve the greatest emission reductions. *See* Grid Experts Amicus Br. 22 (observing that the ACE Rule "imposes greater abatement costs on industry than other approaches would to achieve the same effect").

The Clean Power Plan could not stand, the EPA now concludes, because its consideration of generation shifting exceeded the Agency's narrow authority under Section 7411's plain text. ACE Rule, 84 Fed. Reg. at 32,526–32,527. In promulgating the Clean Power Plan, the EPA read "system of emission reduction" to mean "a set of measures that work together to reduce emissions and that are implementable by the sources themselves." Clean Power Plan, 80 Fed. Reg. at 64,762. And it concluded that both heat-rate improvements and generation shifting "are components of a best system of emission reduction for the affected [electricity generating units] because they entail actions that the affected [units] may themselves undertake that have the effect of reducing their emissions." *Id.* at 64,709 (internal quotation marks omitted).

All of that is wrong, the EPA has since decided. "[T]he Agency now recognizes that Congress 'spoke to the precise question' of the scope of [42 U.S.C. § 7411](a)(1) and clearly precluded the unsupportable reading of that provision asserted in the [Clean Power Plan]." ACE Rule, 84 Fed. Reg. at 32,527. The EPA insists that its current reading is mandated by the statutory text.

It is the EPA's current position that is wrong. Nothing in Section 7411(a)(1) itself dictates the "at and to the source" constraint on permissible ingredients of a "best system" that the Agency now endorses. For the EPA to prevail, its reading must be required by the statutory text. *Peter Pan Bus Lines*, 471 F.3d at 1354. It fails for at least three reasons, any of which is alone fatal.

First, the plain language of Section 7411(a)(1), the root of the EPA's authority to determine the best system, announces its own limitations. Those limitations simply do not include the source-specific caveat that the EPA now interposes and casts as unambiguous.

Second, there is no basis—grammatical, contextual, or otherwise—for the EPA's assertion that the source-specific language of subsection (d)(1) must be read upstream into subsection (a)(1) to equate the EPA's "application of the best system" with the controls States eventually will apply "at and to" an individual source. As the EPA at times acknowledges, the two subsections address distinct steps in the regulatory process, one focused on the EPA's role and the other focused on the States'. Any question as to which limitations pertain to each regulatory actor cannot reasonably be said to have been resolved by Congress in favor of the unambiguous meaning the EPA now advocates.

Third, even if subsections (a)(1) and (d)(1) were read

together in the way the EPA proposes, they would not confine the EPA to designating a best system consisting of at-the-source controls. The EPA's entire theory hinges on the Agency's unexplained replacement of the preposition "for" in "standards of performance for any existing source" with the prepositions "at" and "to." Yet the statutory text calls for standards of performance "for" existing sources. Emission-reduction measures "for" sources may readily be understood to go beyond those that apply physically "at" and "to" the individual source. Emissions trading, for example, might be a way "for" a source to meet a standard of performance.

The shortcomings of its statutory interpretation are more than enough to doom the Agency's claim that Section 7411 announces an unambiguous limit on the best system of emission reduction. The issue is not whether the EPA's counterarguments to each of these points might show its interpretation to be permissible as an exercise of discretion. Again, the EPA has not claimed to be exercising any such discretion here. It insists instead that the unambiguous terms of the statute tie its hands.

After reviewing what Section 7411 clearly says about the nature and limits of the "best system of emission reduction" that Congress called on the EPA to determine, we take up each of the EPA's arguments to show why Section 7411 does not unambiguously support its at-the-source restriction.

a. Section 7411(a) Defines the Best System

The EPA acknowledges, as it must, that Section 7411(a) is the source of the EPA's authority and responsibility to determine the best system of emission reduction for existing sources and set corresponding emission guidelines. *See, e.g.*, ACE Rule, 84 Fed Reg. at 32,534. Indeed, that is the only subsection in which the term "best system of emission

reduction" appears. But the EPA offers no reading of subsection (a)(1) itself.

Section 7411(a)(1) expresses Congress' expectation that the EPA will study all "adequately demonstrated" means of emission reduction. And it directs the EPA to draw on "adequately demonstrated" methods to determine the "best" system to reduce emissions. Congress imposed no limits on the types of measures the EPA may consider beyond three additional criteria: cost, any nonair quality health and environmental impacts, and energy requirements. 42 U.S.C. § 7411(a)(1). Congress largely called on the expert judgment of the EPA to determine for a particular source category and pollutant which already-demonstrated methods compose the "best system."

Because it did not set out separate definitions for either "system" or "best," those words take their ordinary meanings. *See Sandifer v. United States Steel Corp.*, 571 U.S. 220, 227 (2014). Webster's Dictionary offers a representative definition of "system" contemporaneous with the Act's adoption: "[A] complex unity formed of many often diverse parts subject to a common plan or serving a common purpose." *System*, WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY OF THE ENGLISH LANGUAGE UNABRIDGED 2322 (2d ed. 1968). The superlative "best" as applied to a "system of emission reduction" plainly places a high priority on efficiently and effectively reducing emissions. *See Best*, Merriam-Webster, https://www.merriam-webster.com/dictionary/best (last visited Jan. 11, 2021) ("excelling all others," "offering or producing the greatest advantage, utility, or satisfaction").

The ordinary meanings of these terms "reflect[] an intentional effort to confer the flexibility necessary" for effective regulation appropriate to the context. *Massachusetts*

v. EPA, 549 U.S. 497, 532 (2007). As the Supreme Court has acknowledged, "the degree of agency discretion that is acceptable varies according to the scope of the power congressionally conferred." *Whitman v. American Trucking Ass'n*, 531 U.S. 457, 475 (2001); *see Gaughf Props., L.P. v. Commissioner*, 738 F.3d 415, 424–425 (D.C. Cir. 2013); *Sabre, Inc. v. Department of Transp.*, 429 F.3d 1113, 1122, 1124–1125 (D.C. Cir. 2005). Congress in Section 7411 deliberately charged the EPA with identifying the best system of emission reduction to keep pace with escalating threats to air quality, and, within expressed limits, empowered it to make the judgments how best to do so.

The Agency simply ignores how the statutory text defines the "best system of emission reduction," asserting instead that definitional language does not confer regulatory authority. *See, e.g.*, EPA Br. 58–59 ("[I]t is not Section 7411(a) ('Definitions') that grants the agency authority to act."). Section 7411(a)(1)'s designation as a definitional provision deprives it of standalone meaning, the EPA contends. The EPA instead reads it as "subsidiary" to Section 7411(d), regarding state standards of performance for existing sources. EPA Br. 58. But Congress does indeed use definitional provisions to confer regulatory authority. *See, e.g.*, *Weinberger v. Bentex Pharm, Inc.*, 412 U.S. 645, 652–653 (1973) (holding that the statutory definition of "new drug" confers authority upon the FDA). That is precisely what it did in Section 7411(a)(1). *See Sierra Club v. Costle*, 657 F.2d 298, 321 (D.C. Cir. 1981) (describing Section 7411(a)(1) as authorizing the EPA to determine the best system of emission reduction and regulate accordingly); 40 C.F.R. 60.22a.

The EPA offers no support—apart from its own new-found version of "statutory interpretation 101," EPA Br. 65—for ignoring how the Act itself defines and limits the "best

system" determination. Nor does it offer any sound justification for importing language from a different provision governing States' "standards of performance." The EPA's "at and to the source" limitation on "best system" finds no footing in the text of Section 7411(a)(1).

b. Section 7411(d)(1) Does Not Change the Definition

Even taking the EPA's argument on its own terms does not work because Section 7411(d)(1)'s text and statutory context get it no further. To support its narrow reading of the EPA's authority to determine the "best system," the Agency focuses on the phrase "through the application of" in Section 7411(a)(1). That provision defines a "standard of performance" as an emission standard that "reflects the degree of emission limitation achievable through the application of the best system of emission reduction[.]" The EPA says the "application" phrase "requires both a direct object and an indirect object." ACE Rule, 84 Fed. Reg. at 32,524; *accord* EPA Br. 66–68. And, it continues, Congress cannot have meant to leave its indirect object undefined. The EPA says that, grammatically speaking, someone must apply something (the direct object) to something else (the indirect object). EPA Br. 115–116, 118–119. It then picks its preferred, narrow indirect object from a different statutory subsection and casts that object as the only statutorily permissible choice. *See* 84 Fed Reg. at 32,524.

The EPA locates an indirect object in Section 7411(d). Unlike subsection (a)(1), subsection (d)—entitled "Standards of performance for existing sources"—explicates an indirect object. 42 U.S.C. § 7411(d). Borrowing from subsection (d), then, the EPA imports into subsection (a)(1) a limitation of the "best system of emission reduction" to measures that can be applied "to and at *an individual existing source*—i.e., any

building or facility subject to regulation." EPA Br. 58 (emphasis added); *see also* ACE Rule, 84 Fed. Reg. at 32,534.

But the language to which the EPA points supplies the indirect object only of "standards of performance" adopted by States pursuant to Section 7411(d)(1), not of the EPA's "best system of emission reduction" determined pursuant to Section 7411(a)(1). The latter phrase does not even appear in Section 7411(d)(1). To reach its preferred result, the Agency invokes surmise rather than statutory text. It insists that the limitations on States' standards of performance in Section 7411(d)(1)—the second step in the regulatory process—must be read upstream to limit the EPA's "best system of emission reduction" in subsection (a)(1). Nothing in the statute so requires.

In the text, States' standards of performance need only "reflect" the emission guidelines (or "degree of emission limitation achievable") the EPA calculates based on the "best system of emission reduction" it determines. As laid out in the statute and explained above, those state-developed "standards of performance" follow on but are legally and functionally distinct from the "best system" that the EPA develops. The EPA is simply wrong that the statute clearly and unambiguously requires that the unstated indirect object of "application of the best system of emission reduction" under Section 7411(a)(1) must be the same as the indirect object of States' standards of performance as stated in Section 7411(d)(1).

Neither does the grammatical rule the EPA invokes to bridge the gap between these subsections hold up. The crux of the EPA's textual argument is that "the verb 'to apply,' requires both a direct object and an indirect object." ACE Rule, 84 Fed. Reg. at 32,524; EPA Br. 66–68. The first obvious problem is

that, in the relevant passage of Section 7411(a)(1), Congress did not use the verb "apply," but rather the noun "application." The EPA acknowledges this distinction in passing in the ACE Rule, but dismisses it without discussion, offering only that "'application' is derived from the verb 'to apply[.]'" 84 Fed. Reg. at 32,524. That is, of course, true, as far as it goes. The phrase "application of the best system of emission reduction" is what is called a nominalization, a "result of forming a noun or noun phrase from a clause or a verb." *Nominalization*, Merriam-Webster Dictionary https://www.merriam-webster.com/dictionary/nominalization (last visited Jan. 11, 2021). Grammar assigns direct or indirect objects only to verbs—not nouns. No objects are needed to grammatically complete the actual statutory phrase. So much for the grammatical imperative.

Even if we were to take the EPA's leap to the verb "apply" from the noun "application" that actually appears in the statute, the Agency comes up short. The EPA is incorrect to insist that the verb "apply" requires an indirect object. There is nothing ungrammatical about the sentence "In its effort to reduce emissions, the EPA applied the best system of emission reduction." The verb "apply," like its nominalization, may properly be used in a sentence with or without an explicit indirect object. *See Apply*, THOMAS HERBST ET AL., A VALENCY DICTIONARY OF ENGLISH 41–42 (Ian F. Roe et al. eds., 2004) (listing examples of grammatically correct uses with and without direct and indirect objects).[6]

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[6] Take, for instance, the following sentences: "It appears to violate GATT regulations, but the rules for applying the regulations are vague and the Netherlands has so far escaped censure"; "This information may not apply in Scotland, which has a different legal system." *Apply*, THOMAS HERBST ET AL., A VALENCY DICTIONARY

The EPA's shift from nominalization to verb does not, in any event, accomplish much. Either way, the lack of an explicit indirect object in Section 7411(a)(1) does not require that one be borrowed from Section 7411(d)(1). Equally logical indirect objects include, for example, the entire category of stationary sources, or the air pollutant to be limited. In any event, the best system cannot reasonably be said to be unambiguously applicable only to the indirect object the EPA suggests.

The EPA faults the Clean Power Plan for reading "application of" to be functionally equivalent to "implementation of," because "implement" "does not require an indirect object." EPA Br. 73. But neither does "application." So "application" textually supports adoption of the Clean Power Plan just as well as "implementation." Again, so much for grammar mandating the EPA's result.

The argument fails either way, but the fact is that Congress used the nominalization "application of" the best system of emission reduction. A nominalization enables the drafter to leave certain information unspecified—namely, who is acting and where their action is directed. *See, e.g.*, George D. Gopen, *Who Done It? Controlling Agency in Legal Writing, Part II*, 39 LITIG. 12, 12–13 (Spring 2013) (describing how nominalizations create ambiguity). Legal writers, including Congress, employ nominalizations all the time. And they do so with the full awareness that their use preserves flexibility.

Congress reasonably built in leeway for the EPA to

OF ENGLISH 41–42 (examples from sections D1 and D5). Additional examples abound. *See, e.g.*, *Apply*, OXFORD ENGLISH DICTIONARY (3d ed. 2008) (def. I.9) ("Crest bought the firm[,] and, by applying its marketing and distribution muscle, has turned it into a $200 million category killer.").

exercise technical expertise in applying Section 7411, given the variety of pollution problems that it covers and the importance of allowing States maneuvering room under the cooperative federalism scheme. Congress may avoid specifying subjects, objects, or other grammatical information because a degree of adaptability suits the statutory role and purpose. One way Congress can denote that it has delegated to an agency's judgment the task of filling in the on-the-ground details of a statutorily defined program is by declining to dictate grammatically optional information, *see Lehrfeld v. Richardson*, 132 F.3d 1463, 1465–1466 (D.C. Cir. 1998); *Appalachian Power Co. v. EPA*, 135 F.3d 791, 808–810 (D.C. Cir. 1998), including an indirect object that the rules of grammar do not require be explicitly stated, *see, e.g.*, *Peter Pan Bus Lines*, 471 F.3d at 1353–1354.

Even if an implicit indirect object can be surmised, there is more than one plausible candidate here, and the statute does not unambiguously dictate the object. There certainly is no rule—grammatical or otherwise—that the specific indirect object must be the one to which the EPA now points. At the least, other contextually appropriate indirect objects of the "best system" include the source category or the emissions. The EPA has failed to establish that the sole and unambiguous indirect object must be the individual source. The EPA, of course, "may fill the gap[s] the Congress left," and any such "regulation is entitled to deference." *Gaughf Props.*, 738 F.3d at 424; *see also Appalachian Power*, 135 F.3d at 811–812. But in the ACE Rule and in its briefing here, the EPA has assiduously denied the existence of any gap at all. That was error.

c. EPA's Reading Itself Falls Short

The third and equally fatal flaw in the EPA's textual

analysis is its unexplained substitution of the prepositions "at" and "to" where the text it would have us borrow from subsection (d)(1) actually says "for" in referencing "standards of performance for any existing source." *See, e.g.*, ACE Rule, 84 Fed. Reg. at 32,534. As we do with any words enacted by Congress, we must give effect to the preposition it chose. *Cf. Telecommunications Res. & Action Ctr. v. FCC*, 801 F.2d 501, 517–518 (D.C. Cir. 1986) (finding decisive Congress' use of the preposition "under" instead of "by"). The word Congress actually used—"for" the source—lacks the site-specific connotation on which the EPA's case depends.

In its brief, the EPA presents the compound construction it says inexorably follows from reading text from subsection (a)(1) together with text from subsection (d)(1), and says it is restricted to determining a "best system of emission reduction *for* any building, structure, facility, or installation." EPA Br. 56 (formatting modified) (quoting 42 U.S.C. § 7411(a)(1), (a)(3), (a)(6), (d)(1)). The Agency then asserts that "the natural reading" of its proffered construction is that "the methods planned would be 'for' *and act at* the level of the singular, individual source." *Id.* at 62 (emphasis added).

In the preamble to the ACE Rule, the EPA went further, fully substituting the prepositions "at" and "to" in place of the preposition "for" that actually appears in the text the Agency says must be borrowed from subsection (d)(1). ACE Rule, 84 Fed. Reg. at 32,534. It relies on that further substitution to insist that the best system of emission reduction designated by the EPA must be limited to controls "that can be applied at and to," not "for," "a stationary source." *Id.*; *see also id.* at 32,524 ("at"); *id.* at 32,532, 32,534, 32,556 ("at and to"); *id.* at 32,555, 32,529 ("to and at"); *id.* at 32,543 ("at or to"); *id.* at 32,526 n.65 ("to or at"); EPA Br. 4, 58, 74. But nowhere in the ACE Rule does the EPA explain this swap of one preposition for two

meaningfully more restrictive ones. *See, e.g.*, 84 Fed. Reg. at 32,523–32,524, 32,534–32,535.

The EPA rewrites rather than reads the plain statutory text. Section 7411(a)(1), even if cross-referenced to subsection (d)(1) in the way the EPA says it must be, calls for the Agency to determine "the degree of emission limitation achievable through the application of the best system of emission reduction *for* any existing source"—not the application of the best system "at" and "to" such a source. And the word "for" lacks the physical on-site connotation that is so critical to the EPA's reading of the statutory text. Indeed, a standard of performance or system of emission reduction "for" a source just means that the system is "with regard or respect to" or "concerning" the source. *See For*, OXFORD ENGLISH DICTIONARY (2d ed. 1989) (def. 26). In contrast, "at" and "to" tend to connote direct physical proximity or contact. *See At*, OXFORD ENGLISH DICTIONARY (3d ed. 2008) (def. 1.a) ("usually determining a point or object with which a thing or attribute is practically in contact"); *To*, OXFORD ENGLISH DICTIONARY (3d. ed 2008) (def. 5.a) ("Into (or in) contact with; on, against"). A best system "for" a source thus might entail a broader array of controls that concern but are not immediately physically proximate to the source—such as, for instance, generation shifting.

* * *

In sum, the straitened vision of the EPA's best system that the Agency espies in Section 7411 is simply not supported by the text, let alone plainly and unambiguously required by it. The Act calls on the EPA to determine the degree of emission limitation achievable through "application of the best system of emission reduction" without specifying the system's indirect object, and uses the preposition "for" when it calls on the States

to develop "standards of performance for existing sources." 42 U.S.C. § 7411(a), (d). It simply does not unambiguously bar a system of emission reduction that includes generation shifting.

The EPA's position depends critically on words that are not there. It erroneously treats a nominalization of a verb as requiring an indirect object, collapses two separate functions and provisions of the Act in order to supply a borrowed indirect object, does so without any evidence that the borrowed indirect object was what Congress necessarily intended, and narrowly focuses the Agency's authority on that indirect object by using a different preposition from the one that actually appears in the borrowed text. Each of those interpretive moves was a misstep. Read faithfully, Section 7411(a)(1) lacks the straitjacket that the EPA imposes.

Policy priorities may change from one administration to the next, but statutory text changes only when it is amended. The EPA's tortured series of misreadings of Section 7411 cannot unambiguously foreclose the authority Congress conferred. The EPA has ample discretion in carrying out its mandate. But it may not shirk its responsibility by imagining new limitations that the plain language of the statute does not clearly require.

2. Statutory History, Structure, and Purpose

Even looking beyond the text does nothing to substantiate the EPA's proposed reading of Section 7411. *See Kiewit Power Constructors Co. v. Secretary of Labor*, 959 F.3d 381, 395 (D.C. Cir. 2020) (Henderson, J.) ("To discern the Congress's intent, we generally examine the statutory text, structure, purpose and its legislative history.") (quoting *Lindeen v. SEC*, 825 F.3d 646, 653 (D.C. Cir. 2016)). These other tools of statutory interpretation underscore the flexibility

of Section 7411(a)'s text, not the cabined reading the EPA proposes.

We begin by acknowledging Section 7411's role within the Clean Air Act. It is a catch-all, intended to ensure that the Act achieves comprehensive pollution control by guaranteeing that there are "no gaps in control activities pertaining to stationary source emissions that pose any significant danger to public health or welfare." S. REP. NO. 91-1196, at 20 (1970). In other words, Section 7411 is intended to reach pollutants that do not fit squarely within the ambit of the Act's other regulatory provisions. It authorizes regulation of pollutants not controlled by the other programs under the Act. The EPA does not contest that greenhouse gases emitted by powerplants fit that description.

The Agency points to statutory structure and history for evidence that Congress restricted the "best system of emission reduction" under Section 7411(a) to physical controls that are applied "at and to" an existing source. But the history and structure only confirm what the text shows: Nothing the EPA has identified suggests that Congress in Section 7411 meant to so constrict what might be part of a "best system of emission reduction."

The Congress that enacted Section 7411 was well aware that what a "best system" might comprise is necessarily dynamic and evolving. Congress' main limitation was that the "best system" selected by the EPA must be "adequately demonstrated." 42 U.S.C. § 7411(a)(1). And it stated three other key criteria—cost, nonair quality health and environmental impact, and energy requirements—as factors the EPA must take into account. *See id.* With those parameters in place, Congress largely left the identification of the best

system of emission reduction to the Agency's expert scientific judgment.

Consider cues from the Clean Air Act as a whole. In contrast to other systemic benchmarks in the Act, Section 7411(a)(1)'s prescription of the "best system of emission reduction" is striking for its paucity of restrictive language. References to more specific categories of emission-reduction tools appear elsewhere in the Act. A provision governing the Nitrogen Oxides Emissions Reduction Program, for example, directs the Administrator to establish limits based on the "degree of reduction achievable through the *retrofit application* of the best system of continuous emission reduction, taking into account *available technology*[.]" 42 U.S.C. § 7651f(b)(2) (emphasis added). The Act's regional haze program is likewise specific in its call for use of the "best available *retrofit technology*." *Id.* § 7491(b)(2)(A), (g)(2). The specificity of those other provisions highlights the comparative generality of Section 7411(a)'s reference to the "best system of emission reduction."

The sole provision the EPA highlights to shore up its at-the-source theory only further undermines it. The EPA points to the Act's Prevention of Significant Deterioration (PSD) program, 42 U.S.C. § 7475, and its requirement of controls at least as stringent as limits set under Section 7411, *see id.* § 7479(3), to argue that that "the interrelationship between the two types of standards"—the best system of emission reduction and the best available control technology—"is only intelligible if the standards are *in pari materia*." EPA Br. 85. But the distinct roles of the two provisions make clear that the limits in Section 7475 have no place in Section 7411(a)(1).

To qualify for a permit under the PSD program before a source may be built or modified, an applicant must affirm that

it will apply to each source the "best available control technology," or BACT, to limit its emissions. 42 U.S.C. § 7475(a)(4). The statute defines BACT as the degree of control that the permitting agency "determines is achievable for such [major emitting] facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques[.]" *Id.* § 7479(3). The statute further provides that BACT cannot "result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard established pursuant to [S]ection 7411 or 7412 of this title." *Id.* § 7479(3). The listed BACT options, EPA observes, are all physically applicable to the source unit. EPA Br. 85.

But the EPA ignores a critical detail: The BACT requirement applies only to newly constructed or modified sources. *See Alaska Dep't of Env't Conservation v. EPA*, 540 U.S. 461, 472 (2004) (describing 42 U.S.C. § 7475). Any standard established under Section 7411 and also "applicable," per the statutory cross-reference, to a facility regulated for prevention of significant deterioration under Section 7475 would be a standard for new or modified sources established pursuant to Section 7411(b). The BACT requirement does not apply to the existing sources covered by the provision at issue here, Section 7411(d). *See New York v. EPA*, 413 F.3d 3, 13 (D.C. Cir. 2005). Even if Section 7475 tracks Section 7411(b), there is simply no conflict between, on one hand, requiring new source construction to employ the newest and best at-the-source control technologies and, on the other, empowering the EPA to look to a wider range of ways to reduce emissions when it regulates older, existing sources.

The anomaly of looking to Section 7475(a)(4) to confine Section 7411 is highlighted by the fact that BACT permits are

required only in so-called "non-attainment" areas of the country. *See* 42 U.S.C. §§ 7407, 7472, 7474. We are unpersuaded that Congress buried a limit on the EPA's Section 7411 authority to address pollution from existing sources throughout the Nation by making reference to a floor for certain new facilities in certain parts of the country.

The statutory history of the BACT requirement further demonstrates that Congress did not intend that it weaken Section 7411(d). Sections 7475 and 7479 were enacted in the 1977 Clean Air Amendments, Pub. L. No. 95-95, §§ 165, 169, 91 Stat. 685, 735–742 (Aug. 7, 1977). In the very same legislation, Congress restricted the best system of emission reduction for *new* sources to technological methods while explicitly allowing the best system for *existing* sources to include non-technological methods. § 109(c)(1)(A), 91 Stat. at 700. If Congress wanted to confine Section 7411 to at-the-source technologies, it would have done so directly rather than hiding such a substantial limitation in an implicit inference from a more remote statutory provision.

The Clean Air Act's legislative history, including the history of the 1970 enactment of Section 7411 and the 1977 and 1990 amendments, further shows that Congress never imposed on the "best system of emissions reduction" the constraints the EPA now advocates. Before Congress settled on the best-system language it enacted in 1970, the Senate bill proposed to authorize the EPA to set standards for stationary sources "reflect[ing] the greatest degree of emission control" achievable through "the latest available control technology, processes, operating methods, or other alternatives." S. 4358, 91st Cong. § 6 (1970). The phrase "other alternatives" was understood to encompass "[t]he maximum use of available means of preventing and controlling air pollution"—without limitation to technological or at-the-source means. S. REP. NO.

91-1196, at 16. The Senate believed that was "essential" to limit emissions from both new and existing sources. *Id.* The House, for its part, proposed an initial version of Section 7411 that would have "require[d] new sources to 'prevent and control [their] emissions to the fullest extent compatible with the available technology and economic feasibility,'" H.R. 17255, 91st Cong. § 5 (1970), but included no provision regarding the regulation of existing sources.

As enacted, Section 7411 simply requires that the EPA identify as its benchmark for existing sources the "best system of emission reduction." 42 U.S.C. § 7411(a)(1). Nothing that the EPA identifies or that we discern in the relevant history shows the enacting Congress myopically "focused on steps that can be taken at and by individual sources to reduce emissions." EPA Br. 69. And of course, even if Congress at that time was only thinking of at-the-source controls, the EPA was well aware that environmental problems and their solutions rapidly evolve. At the end of the day, it is the statutory text that governs. *See Bostock v. Clayton County*, 140 S. Ct. 1731, 1738 (2020).

Congress has consistently relied on the EPA's expert judgment in identifying the "best system" for existing sources. Its action in making, and then undoing, a limiting amendment to Section 7411's "best system of emission reduction" just for new and modified sources—not existing sources—underscores the point. First, Congress in 1977 amended the standard for new sources to require use of "the best technological system of continuous emission reduction," but did not make any parallel change to the standard for existing sources to add those "technological" and "continuous" limitations. Clean Air Amendments Act of 1977, Pub. L. No. 95-95, § 109(c)(1)(A), 91 Stat. 685; *see also id.* at 700 (adding Section 7411(a)(1)(C)). Then, in 1990, Congress again amended Section 7411, this time

to remove those additional limitations, reverting for new sources to the "best system of emission reduction" that had applied all along to existing sources. Clean Air Act Amendments of 1990, Pub. L. No. 101-549, § 403(a), 104 Stat. 2399, 2631 (1990).

The amendment and re-amendment of the new-source "best system" language emphasizes that Congress consistently avoided imposing any such technological, at-the-source limitation on the measures that EPA might include in the "best system" for reducing emissions from existing-source categories. And it shows that Congress had always understood the existing-source "best system" language to go beyond the technological restrictions that it briefly imposed on the parallel new source provision.

The ACE Rule is the first EPA rule to read the statute as so strictly boxing in the Agency. Although agency practice cannot directly show whether Congress had a specific intent on the matter in question, it is notable that the regulators closest to the issue never before saw what the EPA now insists is obvious on the face of Section 7411.

Over the last half century, no prior Administrator read the Act to foreclose from consideration in the "best system" all but at-the-source means of emission control. Rather, the EPA has exercised latitude to consider any adequately demonstrated approach to reducing harmful pollutants from existing source categories that it believed met the cost, grid-reliability and other statutory criteria. 42 U.S.C. § 7411(a)(1). Where the characteristics of the source category and the pollutant at issue point to emissions trading programs or production shifts from higher- to lower-emitting sources as components of the "best system," the EPA has in the past consistently concluded that it had the authority to consider them.

During the administration of President George W. Bush, for example, the EPA adopted the Clean Air Mercury Rule, 70 Fed. Reg. 28,606 (May 18, 2005), which included a mercury cap-and-trade program as a component of its best system of emissions reduction for existing coal-fired power plants, *see id.* at 28,619–28,620; *id.* at 28,617 ("EPA has determined that a cap-and-trade program based on control technology available in the relevant timeframe is the best system for reducing [mercury] emissions from existing coal-fired Utility Units.").[7]

The EPA's Clinton-era regulation of nitrogen oxide emissions from municipal solid waste combustors likewise relied on Section 7411(d), together with the EPA's waste-management authority under Section 7429, to authorize States to include emissions-trading programs in their State Plans. 40 C.F.R. § 60.33b(d)(2). Under state standards of performance designed to meet guidelines the EPA derived from its "best system," regulated entities were permitted to average the emission rates of multiple units within a single plant as well as trade emission credits with other plants. Municipal Waste Combustors Rule, 60 Fed. Reg. 65,387, 65,402 (Dec. 19, 1995).

The EPA's efforts to distinguish those other Section 7411(d)(1) programs do not work. The EPA claims that the Mercury Rule did not primarily rely on a cap-and-trade

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[7] We vacated the Mercury Rule for unlawfully delisting mercury-emitting electric utility steam generating units from the Section 7412 Hazardous Air Pollutants list. *See New Jersey v. EPA*, 517 F.3d 574, 582–584 (D.C. Cir. 2008). Because we held those mercury sources must be listed, and because Section 7411 cannot be used to regulate air pollutants listed under Section 7412, the existing-source rule the EPA had adopted under Section 7411(d) to control those same mercury emissions from power plants failed as well.

or dispatch shifting program, but rather that the best system rested on a "combination of a cap-and-trade mechanism and * * * the technology needed to achieve the chosen cap level." EPA Br. 72 n.20 (quoting ACE Rule, 84 Fed. Reg. at 32,526). To be clear, that sort of hybrid best system, involving both on-site and system-wide elements, is precisely what the EPA now insists is unprecedented and expressly barred by the statute's text.

Lest there be any doubt that the Mercury Rule's best system rested in significant part on the cap-and-trade mechanism, we note that the EPA in fact approved state implementation plans that adopted *none* of the on-site controls included in the best system and instead relied *entirely* on implementation of the best system's cap-and-trade program. *See, e.g.*, Notice of Intent, 32 La. Reg. 869, 870 (May 20, 2006) (proposing an implementation plan solely reliant on cap-and-trade); Approval and Promulgation of State Plan for Designated Facilities and Pollutants: Louisiana, 72 Fed. Reg. 46,188, 46,188 (Aug. 17, 2007) (approving Louisiana's proposal on the basis that it "would meet [Clean Air Mercury Rule] requirements by participating in the EPA administered cap-and-trade program addressing [mercury] emissions"). Contrary to the EPA's assertions, *e.g.* EPA Br. 4, the Agency plainly has previously embraced beyond-the-source measures of emission reduction as authorized by the statutory text.

The EPA's invocation of its own past practice under Section 7411 falls wide of the mark. It errs in insisting that "the *more than seventy* Section 7411 rules" promulgated for "roughly forty-five years" somehow reflect a consistent adherence to the Agency's new view. EPA Br. 4, 88; *see id.* at 37–38, 88–89; ACE Rule, 84 Fed. Reg. at 32,526. Almost all of the rules to which it refers are irrelevant to the issue at hand. They were for new sources, subject to Section 7411(b), not

existing sources under Section 7411(d). *See* 84 Fed. Reg. at 32,526.

Older facilities that may be capable only of outdated, more polluting methods of generation present different regulatory challenges than new sources. As discussed above in connection with the EPA's reference to BACT requirements for new-source permitting under the PSD program, a requirement that owners and operators constructing new facilities apply state-of-the-art, lowest-emitting equipment and methods "at and to the source" might well be the best available means of reducing emissions for that source category. The same cannot be said for existing sources. A central error of the ACE Rule is that it fails to appreciate that difference. It identifies a handful of measures applicable to and at the source that the EPA suggests may achieve slight reductions. But industry practice demonstrates that better, lower-emitting, reliable, and cost-effective systems for reducing emissions from existing power plants typically also shift generation away from higher-emitting, fossil-fuel-fired capacity when renewable or lower- or zero-emitting generation is an available substitute.

Because the best, most efficient and effective systems for controlling emissions from existing sources ordinarily differ from the best systems for new sources, they are regulated via a distinct statutory track. Only the Section 7411(d) rules are relevant to the EPA's prior understanding of its authority to regulate existing sources. Those prior EPA rules contradict the EPA's position here. Before its about-face in the ACE Rule, all three of the Agency's most recent Section 7411(d) rules included emissions trading or generation shifting to lower-emitting sources. *See* Clean Power Plan, 80 Fed. Reg. at 64,755–64,756; Clean Air Mercury Rule, 70 Fed. Reg. at

28,606, 28,617, 28,619–28,620; Municipal Waste Combustors Rule, 60 Fed. Reg. 65,387, 65,402 (Dec. 19, 1995).

To put the EPA's mistaken reading of Section 7411 in perspective, consider how it effectively relegates federal regulators back to the sidelines where they stood before Congress overhauled the Clean Air Act in 1970. The federal government had until then done little more than provide information and guidance to cheer on States' air-quality regulators. *See Train v. NRDC*, 421 U.S. 60, 64 (1975) (noting that the States' response to earlier iterations of the Act focused on information and incentives had been "disappointing").

With the 1970 amendments, a virtually unanimous Congress dramatically strengthened the federal government's hand in combatting air pollution. *See Train*, 421 U.S. at 64 ("These Amendments sharply increased federal authority and responsibility. * * * The difference * * * was that the States were no longer given any choice as to whether they would meet th[eir statutory] responsibility."); *cf. EPA v. EME Homer City Generation, LP*, 572 U.S. 489, 497 (2014) (noting this progression toward "increasing[ly] rigor[ous]" federal regulation of interstate air pollution). Congress did so "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population[.]" 42 U.S.C. § 7401(b)(1). The EPA's newly enhanced authority was "designed to provide the basis" for "a massive attack on air pollution." S. REP. NO. 91-1196, at 1. Section 7411(d) ensured that there would be "no gaps in control activities pertaining to stationary source emissions that pose any significant danger to public health or welfare." *Id.* at 20.

Describing the Act shortly before its passage, Republican Senator John Cooper explained that the "philosophy of the bill

abandons the old assumption of requiring the use of only whatever technology is already proven and at hand" and instead "set[s] out what is to be achieved." 116 CONG. REC. 32,919 (1970). To that end, the Act did not finely detail specific approaches to enumerated sources or types of air pollution. *See* 116 CONG. REC. 32,901–32,902 (1970) (statement of Sen. Muskie). Congress chose instead to entrust the EPA with flexible powers to craft effective solutions. Only by doing so could air quality regulation hope to reflect developing understandings of escalating problems and bring to bear as-yet-unseen solutions.

American air quality is the proof of that approach. The EPA has worked closely with industry, States, and the public to develop the world's most nimble, responsive, and effective regime of air pollution regulation. For example, in the half-century since the 1970 Act, "the combined emissions of * * * six key pollutants regulated under the National Ambient Air Quality Standards dropped by 73 percent" between 1970 and 2017. *EPA Releases 2018 Power Plant Emissions Demonstrating Continued Progress*, EPA (Feb. 20, 2019), https://www.epa.gov/newsreleases/epa-releases-2018-power-plant-emissions-demonstrating-continued-progress (last visited Jan. 11, 2021).

The EPA's new reading of Section 7411 would atrophy the muscle that Congress deliberately built up. The EPA asserts it lacks authority to curb a pollutant that the Agency itself has repeatedly deemed a grave danger to health and welfare but that eludes effective control under other provisions of the Act. We do not believe that Congress drafted such an enfeebled gap-filling authority in Section 7411.

* * *

In sum, traditional tools of statutory interpretation reveal nothing in the text, structure, history, or purpose of Section 7411 that compels the reading the EPA adopted in the ACE Rule.

3. Compliance Measures

In the ACE Rule, the EPA also limited the measures that sources may use to comply with the States' standards of performance set under Section 7411(d). Recognizing that sources generally have "broad discretion" in how they comply with state standards, 84 Fed. Reg. at 32,555, the EPA nonetheless categorically excluded two specific measures from the States' consideration: averaging and trading, and biomass co-firing. It did so on the ground that these measures do not meet two criteria it determined were required of compliance measures: that they be (1) "capable of being applied to and at the source" and (2) "measurable at the source using data, emissions monitoring equipment or other methods to demonstrate compliance[.]" *Id.* The EPA identified these criteria on account of "both legal and practical concerns[.]" *Id.*

The Agency's legal concern was that non-source-specific compliance measures "would be inconsistent with the EPA's interpretation of the" best system of emission reduction as itself plant-specific. ACE Rule, 84 Fed. Reg. at 32,555–32,556. In that way, the EPA extended to States' compliance measures the same incorrect textual interpretation of the Clean Air Act that underlay its determination of what best systems may include—namely, that the system must be one that can be applied to and at the individual source. The EPA reasoned that "implementation and enforcement of such standards should correspond with the approach used to set the standard in the first place." *Id.* at 32,556.

The Agency's practical concern was that compliance measures that are not source-specific could result in "asymmetrical regulation[,]" meaning the stringency of standards could vary across sources. ACE Rule, 84 Fed. Reg. at 32,556. It argues here that such regulation "could have significant localized adverse consequences" in the case of many pollutants regulated under Section 7411(d). EPA Br. 240.

Because we hold that the EPA erred in concluding Section 7411 unambiguously requires that the best system of emission reduction be source specific, we necessarily reject the ACE Rule's exclusion from Section 7411(d) of compliance measures it characterizes as non-source-specific. The Agency tied that exclusion to its flawed interpretation of the statute as unambiguously confined to measures taken "at" individual plants, so it falls with that decision. ACE Rule, 84 Fed. Reg. at 32,555–32,556.

The statute says nothing about the measures that sources may use to comply with the standards States establish under Section 7411(d), and the EPA cites no separate authority that would require compliance measures to be source-specific, or that Congress meant to so hogtie the States in devising standards of performance. Regardless of any policy-based reasons the EPA offers for limiting compliance measures, then, its decision to exclude averaging and trading and biomass co-firing is foreclosed by its legally erroneous starting point.

Neither can the EPA's policy-based reasons sustain its decision to exclude its disfavored non-source-specific compliance measures in the context of carbon dioxide emissions. Apart from its statutory interpretation, the EPA's only ground for excluding those compliance measures is the Agency's stated concern to avoid asymmetrical regulation.

ACE Rule, 84 Fed. Reg. at 32,556. It argues that asymmetrical regulation "could have significant localized adverse consequences for public health and the environment." EPA Br. 240. The Agency points to the case of fluoride—another pollutant regulated under Section 7411(d)—to note that allowing sources to meet state standards of performance by averaging emissions across units or between facilities "could cause serious environmental impacts on local communities where pollution was under-controlled, causing localized damage." *Id.* In light of such considerations, the EPA worried that a system of averaging and trading "would undermine the EPA's determination" of the best system of emission reduction, leading to the sort of localized consequences the system is designed to guard against. ACE Rule, 84 Fed. Reg. at 32,557.

But that point does not support the EPA's categorical rule, let alone prove that the statute unambiguously compels the Agency's reading. Unlike pollutants such as fluoride, carbon dioxide emissions do not pose localized concerns at the site of emission. Whereas the EPA might determine that the best system for reducing fluoride emissions is one that can be applied to and at the source, and it would be reasonable for the EPA in turn to limit compliance measures to correspond with such a "best system," the same cannot be said of carbon dioxide. Indeed, the EPA recognizes that "CO_2 is a global pollutant with global effects[,]" meaning "there may be few direct and area public health consequences from asymmetrical regulation of carbon dioxide within a State." EPA Br. 239.

The Agency defends its concern about asymmetrical regulation in the context of carbon dioxide emissions with the unsupported contention that an interpretation of Section 7411(d) that allowed non-source-specific compliance measures "would not be limited to carbon dioxide alone." EPA Br. 240. But there is no reason to conclude, and petitioners do not argue,

that the statute requires the EPA to permit non-source-specific compliance measures for every pollutant it regulates under Section 7411. The statute is not so rigid as EPA supposes. In fact, Section 7411 itself does not textually restrict the States' choice of compliance measures for their sources at all. *See also* Power Cos. Pet'rs Br. 25–26; Biogenic Pet'r Br. 16–17. Even if the EPA might reasonably limit compliance measures in specific situations based on its determination of the best system for reducing particular types of emissions with localized consequences, the statute imposes no requirement that such limitations be uniform across the regulation of different pollutants.

In sum, the EPA's conclusion on compliance by sources rises and falls with its legally flawed interpretation of the statute. The Agency's practical concern about asymmetrical regulation could not, in any event, support the exclusion of biomass co-firing or averaging and trading in the particular context of carbon dioxide emission regulation.

B. THE MAJOR QUESTIONS DOCTRINE

The EPA also references the so-called "major questions" doctrine in defense of its statutory interpretation and the ACE Rule. 84 Fed. Reg. at 32,529. But that doctrine does not confine the EPA to adopting solely emission standards that can be implemented physically to and at the individual plant.

The Supreme Court has said in a few cases that sometimes an agency's exercise of regulatory authority can be of such "extraordinary" significance that a court should hesitate before concluding that Congress intended to house such sweeping authority in an ambiguous statutory provision. *See King v. Burwell*, 576 U.S. 473, 485–486 (2015); *Gonzales v. Oregon*, 546 U.S. 243, 262, 266–267 (2006); *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 159 (2000); *accord*

Utility Air Regulatory Group v. EPA (*UARG*), 573 U.S. 302, 324 (2014); *see also MCI Telecommc'ns v. AT&T*, 512 U.S. 218, 231 (1994). Where there are special reasons for doubt, the doctrine asks whether it is implausible in light of the statute and subject matter in question that Congress authorized such unusual agency action. *See, e.g.*, *UARG*, 573 U.S. at 324 (considering whether the challenged rule would "bring about an enormous and transformative expansion in EPA's regulatory authority without clear congressional authorization"); *Brown & Williamson*, 529 U.S. at 161 (holding that the FDA could not regulate tobacco because it was "plain that Congress ha[d] not given the FDA the authority that it s[ought] to exercise").

In the ACE Rule, the EPA stated that, while its interpretation of Section 7411 did not depend on the "major question[s] doctrine[,]" the Agency believed that "that doctrine should apply here[.]" 84 Fed. Reg. at 32,529. The Agency reasoned that the Clean Power Plan would have had "billions of dollars of impact on regulated parties and the economy," would have "affected every electricity customer[,]" was "subject to litigation involving almost every State," and would have upset the balance of regulatory authority between federal agencies and the States. *Id.* For those reasons, the Agency concluded that the "interpretive question raised"—whether the "best system of emission reduction" can include measures other than improvements to and at the physical source—"must be supported by a clear[]statement from Congress." *Id.* That was incorrect.

1. The EPA's Regulatory Mandate

Unlike cases that have triggered the major questions doctrine, each critical element of the Agency's regulatory

authority on this very subject has long been recognized by Congress and judicial precedent.

Most importantly, there is no question that the regulation of greenhouse gas emissions by power plants across the Nation falls squarely within the EPA's wheelhouse. The Supreme Court has ruled specifically that greenhouse gases are "air pollutants" covered by the Clean Air Act. *Massachusetts v. EPA*, 549 U.S. at 532. More to the point, the Court has told the EPA directly that it is the Agency's job to regulate power plants' emissions of greenhouse gases under Section 7411. "Congress delegated to EPA the decision whether and how to regulate carbon-dioxide emissions from powerplants" through a "§ 7411 rulemaking[.]" *AEP*, 564 U.S. at 426–427. The separate opinion agrees. *See* Separate Op. at 14 ("Does the Clean Air Act direct the EPA to make our air cleaner? Clearly yes. Does it require at least some carbon reduction? According to *Massachusetts v. EPA*, again yes.").

On top of that, the issuance of regulations addressing greenhouse gas pollution is mandatory under the statute because of longstanding endangerment findings. In *Massachusetts v. EPA*, the Supreme Court directed the EPA either to make an endangerment finding under the statute for greenhouse gas pollution, or to explain why it would not do so. 549 U.S. at 532–535. The EPA complied. For now more than a decade—from 2009 to the present day in the ACE Rule itself—the EPA has consistently and repeatedly recognized the serious danger that greenhouse gas pollution poses to human health and welfare. *See* ACE Rule, 84 Fed. Reg. at 32,533; New Source Rule, 80 Fed. Reg. at 64,530–64,531; 2009 Endangerment Finding, 74 Fed. Reg. at 66,496–66,497. By statute, that finding triggers a *mandatory* duty on the EPA to regulate greenhouse gas pollution. 42 U.S.C. § 7521(a)(1) (motor vehicle emissions); 42 U.S.C. § 7411(b) (stationary

sources that contribute significantly to such dangerous pollution).[8]

So the EPA has not just the authority, but a statutory duty, to regulate greenhouse gas pollution, including specifically from power plants.

In that way, the pollution measures in the Clean Power Plan do not fit the major-question mold of prior cases. For example, in *Brown & Williamson*, the major question was whether the agency had authority to regulate tobacco at all. There, the Supreme Court ruled that there was "reason to hesitate" before concluding that the provisions of the Food, Drug, and Cosmetic Act covering restricted devices, *Brown & Williamson*, 529 U.S. at 134 (citing 21 U.S.C. § 360j(e)), gave the Food and Drug Administration the authority to regulate

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[8] As discussed below with respect to the challenge brought by the Coal Petitioners (*infra* at III.A.1), the legal basis for the EPA's regulation of greenhouse gas emissions from existing power plants in both the Clean Power Plan and the ACE Rule was the Agency's prior 2015 decision to issue standards of performance for carbon dioxide emitted from new power plants. That decision, in turn, was based on the Agency's recognition (since the 1970s) that fossil-fuel-fired power plants contribute significantly to air pollution, which "may reasonably be anticipated to endanger the public health or welfare." 42 U.S.C. § 7411(b)(1)(A); *see* Air Pollution Prevention and Control: List of Categories of Stationary Sources, 36 Fed. Reg. 5931, 5931 (March 31, 1971); Air Pollution Prevention and Control: Addition to the List of Categories of Stationary Sources, 42 Fed. Reg. 53,657, 53,657 (Oct. 3, 1977). The EPA also determined in 2015 that power plants contribute significantly to greenhouse gas pollution in particular. *See* New Source Rule, 80 Fed. Reg. at 64,531. That determination, combined with the determination that greenhouse gases are dangerous to public health and welfare, triggers a mandatory duty to regulate under Section 7411(b)(1)(A).

tobacco given its "unique political history" and its role as a "significant portion of the American economy." *Id.* at 159. The Court reasoned based on the overall drug-regulatory scheme, as well as Congress having "created a distinct regulatory scheme for tobacco products," that Congress "could not have intended to delegate a decision of such economic and political significance to an agency in so cryptic a fashion." *Id.* at 159–160.

That question of agency authority to regulate the matter in question was absent for the Clean Power Plan. In fact, the Supreme Court in *Massachusetts v. EPA* rejected the analogy between regulation of greenhouse gases as a pollutant under the Clean Air Act and regulation of tobacco as a drug under the Food, Drug, and Cosmetic Act. 549 U.S. at 530–531. Treating tobacco as a drug would have been wholly novel, requiring the agency to ban virtually all tobacco products—a result the Court suspected Congress did not intend. *Id.* at 531; *Brown & Williamson*, 529 U.S. at 143. By contrast, the Supreme Court explained, greenhouse gases are air pollutants that fall squarely within the Clean Air Act's coverage, and the Act would subject such pollutants, if the agency makes the necessary findings, only to regulation, not prohibition. *Massachusetts v. EPA*, 549 U.S. at 531.

The Clean Air Act also contains its own limits on regulation, like mandating that the EPA take into account such factors as available technology and the cost of compliance. *Id.* (citing 42 U.S.C. § 7521(a)(2)); *see also* 42 U.S.C. § 7411(a)(1) (requiring consideration of health and environmental impacts, energy requirements, and cost). In that way, Congress designed the Clean Air Act's processes for regulating air pollution to adapt to "changing circumstances and scientific developments" without imposing unreasonable technological or financial burdens on industry. *Massachusetts*

v. EPA, 549 U.S. at 532. So, unlike the major question of tobacco regulation in *Brown & Williamson*, there is "nothing counterintuitive" about the EPA's reasonable regulation of dangerous airborne substances like greenhouse gases. *Id.* at 531–532.

Similarly, the major question in *UARG* was whom the EPA was attempting to regulate. In that case, the Supreme Court held that the EPA's statutory permitting authority for the construction and modification of stationary sources was "designed to apply to, and cannot rationally be extended beyond, a relative handful of large sources capable of shouldering heavy substantive and procedural burdens"—sources like power plants. 573 U.S. at 322. The Court held that, without clear statutory grounding, the EPA's effort to extend permitting requirements to literally millions of small sources of greenhouse gas pollution but of no other regulated pollutants—sources like schools, hospitals, churches, and shopping malls—overshot its statutory authority. *Id.* at 324, 328.

The Clean Power Plan, by contrast, regulated the very entities the EPA was told by the Supreme Court in *AEP* and *UARG* to regulate—fossil-fuel-fired power plants. And it employed statutory tools that were "suitable" for application to the long-regulated power industry. *See UARG*, 573 U.S. at 323, 324 n.7. *American Electric Power* pointed the Agency to regulation under Section 7411 specifically, explaining that "Congress delegated to EPA the decision whether and how to regulate carbon-dioxide emissions from [new, modified, and existing] powerplants" using the regulatory tools laid out in Section 7411. 564 U.S. at 424–426.

That is no doubt a significant task for the EPA. But that is not because of any agency overreach. It is the product of

Congress' charge that the EPA regulate air pollution nationwide. And with respect to regulating greenhouse gas pollution in particular, it reflects the fact that fossil-fuel-fired power plants predominate the power industry and are spread across the Nation. *See* United States Energy Information Administration (EIA), *Frequently Asked Questions: What is U.S. Electricity Generation by Source?* (Nov. 2, 2020), https://www.eia.gov/tools/faqs/faq.php?id=427&t=2 (last visited Jan. 11, 2021); EIA, *U.S. Energy Mapping System*, https://www.eia.gov/state/maps.php (last visited Jan. 11, 2021). So much so that they "are by far" the greatest stationary contributor to greenhouse gas pollution and the significant dangers it causes for the public health and welfare. New Source Rule, 80 Fed. Reg. at 64,522.

2. Best System of Emission Reduction

So *what* the EPA may regulate (greenhouse gas pollution), and *whom* it may target (power plants), and *how* (under Section 7411) have all been resolved and so do not trigger the major questions doctrine.

That leaves the EPA no place to house its major-question objection other than in the interpretation of the statutory term "best system of emission reduction," 42 U.S.C. § 7411(a)(1). More specifically, the EPA says the use of any emission-control measures that do not operate at the individual physical plant level requires an express statement from Congress, and that federal standards that might encourage generation-shifting are therefore categorically forbidden under Section 7411.

But the major questions doctrine does not apply there either for a number of reasons.

a. Statutory Design

For starters, the "best system of emission reduction" plays a cabined role in the statutory scheme. The determination of the best system of emission reduction is entirely internal to the EPA. The EPA itself evaluates relevant scientific, technological, and economic evidence to identify, in its judgment, the "best system of emission reduction" available, and the "degree of emission limitation achievable" through it. 42 U.S.C. § 7411(a)(1).

In making that determination, the statute significantly reins in the EPA's judgment by requiring the Agency to (1) "tak[e] into account the cost of achieving such reduction," (2) factor in "any nonair quality health and environmental impact," (3) balance the effect on "energy requirements," and (4) ensure that the system has been "adequately demonstrated[.]" 42 U.S.C. § 7411(a)(1). To be "adequately demonstrated[,]" we have explained, the system must be shown to be reasonably "reliable," "efficient," and "expected to serve the interests of pollution control without becoming exorbitantly costly[.]" *Essex Chem. Corp. v. Ruckelshaus*, 486 F.2d 427, 433 (D.C. Cir. 1973), *cert. denied*, 416 U.S. 969 (1974); *see also Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 375, 391 (D.C. Cir. 1973) (whether a system is adequately demonstrated "cannot be based on 'crystal ball' inquiry").[9]

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[9] In addition to these statutory constraints, the EPA has tied its own hands by requiring that the best system include only actions touching three bases: (i) they reduce emissions (rather than, for example, capturing emissions after they are released into the air by planting trees), (ii) sources themselves can implement them, and (iii) they target supply-side activities. *See* Clean Power Plan, 80 Fed. Reg. at 64,776, 64,778–64,779.

Once the EPA identifies a best system that meets those requirements and calculates the degree of emission limitation it allows, the Clean Air Act leaves it to the States to set their own standards of performance for their existing pollution sources. 42 U.S.C. § 7411(d). The cooperative-federalism design of Section 7411(d) gives the States broad discretion in achieving those emission limitations. *See AEP*, 564 U.S. at 428 ("The Act envisions extensive cooperation between federal and state authorities, generally permitting each State to take the first cut at determining how best to achieve EPA emissions standards within its domain[.]") (internal citations omitted). In addition, Section 7411(d) expressly allows States, in setting their emission standards, to "take into consideration, among other factors, the remaining useful life" of its existing sources. 42 U.S.C. § 7411(d).

So the EPA's scientific and technological identification of the best system of emission reduction cannot bear the major-question label. Determining the system is a task expressly and indisputably assigned by Congress to the EPA and requiring specialized agency expertise. That system serves only as the basis for the EPA to set the emission-reduction targets in its quantitative guidelines. The States retain the choice of how to meet those guidelines through standards of performance tailored to their various sources. Neither exercise entails resolution of a major question.

The EPA argues that its own best-system process raised a major question by "impos[ing] 'generation shifting[.]'" EPA Br. 99. But under Section 7411(d), the EPA does not impose the "best system of emission reduction" on anyone. Instead, each State decides for itself what measures to employ to meet the emission limits, and in so doing may elect to consider the "remaining useful life" of its plants and "other factors." 42 U.S.C. § 7411(d). *See* Clean Power Plan, 80 Fed. Reg. at

64,709–64,710, 64,783. The Clean Power Plan, in fact, afforded States considerable flexibility in choosing how to calculate and meet their emissions targets. *See, e.g.*, *id.* at 64,665, 64,756–64,757, 64,834–64,837.[10]

Congress already focused on the issue and made the decision to rope the EPA's selection of a best system of emission reduction about with all of those substantive and structural limitations. So the major questions doctrine does not provide any basis for concluding that the Clean Air Act *categorically* forecloses the EPA's consideration of even those generation-shifting measures that are already widely in use by States and power plants and have been demonstrated to be reasonable, reliable, effective, and not unduly disruptive to the regulated industry. *See* Clean Power Plan, 80 Fed. Reg. at 64,735, 64,769.

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[10] The Clean Power Plan expressly contemplated that States and sources might choose to meet their emissions targets by using measures other than the specific heat-rate improvements and generation shifting that the EPA had identified in its best system. *See* 80 Fed. Reg. at 64,755–64,758. The EPA offered a list of alternative available technologies that reduced power plants' carbon dioxide emissions per megawatt, including carbon capture and storage, heat-rate improvements at non-coal plants, fuel switching to gas, fuel switching to biomass, and waste heat-to-energy conversion. *Id.* at 64,756. In certain situations, for example, modifying coal-fired plants to burn natural gas could "help achieve emission limits consistent with the [best system]." *Id.* The Agency also identified a list of alternative measures that States could implement to lower overall emissions from fossil-fuel-fired plants. Those measures included, for example, demand-side energy efficiency—a policy tool that the EPA expected some States to use because "the potential emission reductions from demand-side [energy efficiency] rival those from [generation shifting] in magnitude[.]" *Id.*

In that respect, the EPA's argument sounds much like a second argument rejected by the Supreme Court in *UARG*. In addition to the scope question discussed above, the Court addressed whether the EPA could require facilities that emit conventional pollutants also to implement the "best available control technology" for greenhouse gases. *UARG*, 573 U.S. at 329–333 (citing 42 U.S.C. § 7475(a)(4)). Like the EPA here, the industry petitioners argued that the "best available control technology" standard was "fundamentally unsuited" to greenhouse gas emissions because it had "traditionally" focused on "end-of-stack controls." *Id.* at 329–330. "[A]pplying it to greenhouse gases," the industry petitioners insisted, would make the "best available control technology" standard "more about regulating energy use, which will enable regulators to control every aspect of a facility's operation and design[.]" *Id.* at 330 (internal quotation marks omitted).

The Supreme Court rejected that challenge. The Court explained that the EPA's guidance contemplated both "end-of-stack"–type controls *and* energy efficiency measures. *UARG*, 573 U.S. at 330. And, critically, the Court emphasized that the statute and regulations already imposed "important limitations on [best available control technology] that may work to mitigate petitioners' concerns about 'unbounded' regulatory authority." *Id.* at 331. Among those limitations was the EPA's longstanding statutory interpretation that the best available control technology was required "only for pollutants that the source itself emits," and the EPA's existing guidance that permitting authorities should "consider whether a proposed regulatory burden outweighs any reduction in emissions to be achieved." *Id.* The statute also required the EPA to determine the best available control technology with reference to "energy, environmental, and economic impacts and other costs." 42 U.S.C. § 7479(3); *see also UARG*, 573 U.S. at 333 n.9.

So too here: The numerous substantial and explicit constraints on the EPA's selection of a best system of emission reduction foreclose using the major questions doctrine to write additional, extratextual, and inflexibly categorical limitations into a statute whose "broad language * * * reflects an intentional effort to confer the flexibility necessary to forestall * * * obsolescence." *Massachusetts v. EPA*, 549 U.S. at 532; *see also Transmission Access Policy Study Group v. FERC*, 225 F.3d 667, 711 (D.C. Cir. 2000) (where Congress has spoken, court upholds as within agency authority an order that "fundamentally change[d] the regulatory environment in which utilities operate" and "introduc[ed] meaningful competition into an industry that since its inception has been highly regulated and affecting all utilities in a similar way"), *aff'd sub nom. New York v. FERC*, 535 U.S. 1 (2002).

The EPA points to the Supreme Court's statement in *UARG* that "[w]hen an agency claims to discover in a long-extant statute an unheralded power to regulate 'a significant portion of the American economy,' we typically greet its announcement with a measure of skepticism." 573 U.S. at 324 (quoting *Brown & Williamson*, 529 U.S. at 159).

True. But, as already explained, the EPA made no new discovery of regulatory power with the Clean Power Plan. While power plants are significant players in the American economy, they have been subject to regulation under Section 7411 for nearly half a century. *See, e.g.*, *Costle*, 657 F.2d at 318; *Oljato Chapter of Navajo Tribe v. Train*, 515 F.2d 654, 656–57 (D.C. Cir. 1975). Their emission of massive amounts of carbon dioxide has long been known. And the source of the EPA's duty to regulate that greenhouse gas pollution from power plants was the plain statutory text and Supreme Court precedent, not something the EPA pulled out of a hat. *See AEP*, 564 U.S. at 425; *Massachusetts v. EPA*, 549 U.S. at 532.

In sum, the Clean Air Act expressly confers regulatory authority on the EPA to set standards for reducing greenhouse gas emissions from fossil-fuel-fired power plants nationwide. Congress knew both the scope and importance of what it was doing. And it cabined the EPA's authority with concrete and judicially enforceable statutory limitations. The major questions doctrine is meant to discern, not override, such statutory judgments. Doubly so when the regulatory authority and its reach have been affirmed and enforced by the Supreme Court.

b. Regulatory Consequences

The problems with the EPA's approach to the major-question analysis do not stop there. The Agency also conflates the significance of greenhouse gas regulation of power plants generally with any significance attributable solely to the EPA's choice of a "best system of emission reduction"—the statutory provision where the EPA tried to anchor its major-question objection. Remember, the EPA concluded that the major questions doctrine was triggered centrally by (i) the Clean Power Plan's "billions of dollars of impact" on the economy; (ii) its effect on "every electricity customer"; (iii) the number of litigation challenges it spawned, "involving almost every State"; and (iv) its perceived shifting of regulatory authority between federal agencies and the States. ACE Rule, 84 Fed. Reg. at 32,529.

Taking the characterizations as true, those consequences are a product of the greenhouse gas *problem*, not of the best-system's role in the solution. Given the number and dispersion of fossil-fuel-fired power plants, any nationwide regulation of their greenhouse gas pollution that meaningfully addresses emissions will necessarily affect a broad swath of the Nation's electricity customers. Under the EPA's grave endangerment

finding, so too would a *failure* to regulate those greenhouse gas emissions. *See* 2009 Endangerment Finding, 74 Fed. Reg. at 66,496.

As for the "billions of dollars of impact[,]" the EPA has offered no evidence tying that cost to generation shifting rather than physical plant adjustments or a variety of other means States might choose for complying with emission limits. As the EPA itself previously acknowledged, generation shifting can be cheaper than other demonstrated methods of reducing greenhouse gas emissions, like carbon capture and storage, that take place "at" the source (and thus fall within the EPA's current statutory vision). *See* Clean Power Plan, 80 Fed. Reg. at 64,727.[11] Moreover, the Clean Power Plan's significant projected economic impact was not atypical for Clean Air Act rulemakings by the EPA. *See, e.g.*, *Costle*, 657 F.2d at 314 (upholding 1979 new source performance standards governing emission control by coal-burning power plants that imposed "tens of billions of dollars" of costs on the power sector).

Even assuming that the EPA's federalism concerns could trigger the major questions doctrine (rather than the federalism clear-statement canon), they carry no material weight here. That is because the statutory role of the best system of emission reduction under Section 7411(d) textually preserves and enforces the States' independent role in choosing from among the broadest range of options to set standards of performance appropriate to sources within their jurisdiction. In fact, it is the

[11] The EPA now takes the position that natural gas co-firing is not adequately demonstrated and that neither co-firing nor carbon capture and storage is part of the best system of emission reduction. *See* ACE Rule, 84 Fed. Reg. at 32,544–32,545, 32,549. But those methods are amenable to implementation "to" and "at" the source, in keeping with the EPA's statutory view.

ACE Rule's unreasoned barriers to certain compliance measures, like generation shifting and biomass co-firing, that hamstring the States. *See supra* Part II.A.3 (analyzing ACE Rule, 84 Fed. Reg. at 32,555–32,556).

Finally, it seems doubtful that the volume of litigation aimed at a regulation can reasonably bear on its major-question status. The Supreme Court has certainly never embraced that idea. For good reason. A doctrine at the mercy of litigation stratagems, or the mere existence of disagreements over which parties find advantage in filing suit, cannot be an elucidating or even logically relevant tool of statutory interpretation.

In any event, the EPA offers no basis for concluding that the best-system determination is what lit the litigation fire. After all, the ACE Rule too has been "subject to litigation" involving 43 States and all manner of other interested parties, despite the Rule's jettisoning of generation shifting as part of the best system of emission reduction. *See* Opinion Caption, *supra*.

c. Regulating in the Electricity Sector

The ACE Rule's last attempt to wrap the best-system determination in the major-question mantle asserts that including generation shifting as part of the best system of emission reduction lacks a "valid limiting principle," and that, by "shifting focus to the entire grid[,]" it would "empower" the Agency "to order the wholesale restructuring of any industrial sector[.]" ACE Rule, 84 Fed. Reg. at 32,529. But that is entirely wrong. The Clean Power Plan was aimed not at regulating the grid, but squarely and solely at controlling air pollution—a task at the heart of the EPA's mandate. Indeed, the EPA's reasoning in the ACE Rule defeats its own argument.

The EPA suggests that counting generation shifting among the tools for emission reduction risks expanding the Agency's regulatory sights too far, because "*any* action affecting a generator's operating costs could impact its order of dispatch and lead to generation shifting." ACE Rule, 84 Fed. Reg. at 32,529 (emphasis added). That is exactly right: *Any* regulation of power plants—even the most conventional, at-the-source controls—may cause a relative increase in the cost of doing business for particular plants but not others, with some generation-shifting effect. That is how pollution regulation in the electricity sector has always worked. Regulators—including, for example, Congress in the Clean Air Act's acid rain cap-and-trade program, 42 U.S.C. §§ 7651–7651o—have long facilitated those generation-shifting effects to serve the goal of pollution reduction. *See* Grid Experts Amicus Br. 13–15.

So the EPA's contention that it cannot consider measures resulting in generation shifting as part of its best system proves far too much: If that were so, the EPA would be limited to considering only measures that power plants could adopt at zero cost, so as to maintain their relative-dispatch position. That is, of course, incompatible with Congress' instruction that the best system take cost into account as only one factor among several, *see* 42 U.S.C. § 7411(a)(1), and contrary to the very nature of environmental law, which requires the regulation of polluters and material changes in their pollution emissions.

The EPA's argument also ignores, again, the critical statutory limitations that the Clean Air Act imposes on the selection of a best system of emission reduction and its function in state plans. Under Section 7411(d), the EPA lacks the authority to "order the wholesale restructuring" of anything. All it can do is identify the best system of emission reduction that has been adequately demonstrated within the cost, energy-

requirement, and other substantive constraints set by Congress, and then calculate achievable emission goals by reference to that system. 42 U.S.C. § 7411(a)(1). States, in turn, set standards of performance only "for" any "*existing source*[,]" and need not implement any aspect of the EPA's "best system[.]" *Id.* § 7411(d)(1) (emphasis added). And the EPA's determination about how best to combat air pollution is, of course, subject to judicial review, including on questions like whether a system has been adequately demonstrated and whether the Agency adequately considered costs. 42 U.S.C. § 7607(b); *cf. AEP*, 564 U.S. at 427; *UARG*, 573 U.S. at 333 n.9. Congress' carefully calibrated system—involving scientific and technological evidence-gathering, close study of existing industry practice, constrained discretion, divided regulatory authority, collaboration with States, and judicial review—leaves no room for the unauthorized agency overreach that the EPA fears.

A group of States and industry groups intervened with other major-question challenges, but their salvos all fall short. They argue that the major questions doctrine is implicated because the EPA has "'no expertise' in electricity generation, transmission, and reliability." State & Industry Intervenors Repeal Br. 30 (quoting *King*, 576 U.S. at 474); *see also Gonzales*, 546 U.S. at 267 (rejecting interpretive rule of the Attorney General that was "both beyond his expertise and incongruous with the statutory purposes and design"). But Section 7411 not only foresees, but *demands* that the EPA consider "energy requirements" when assessing the best system of emission reduction. 42 U.S.C. § 7411(a)(1). The Supreme Court in *AEP* recognized the EPA's signal role in regulating greenhouse gases under Section 7411 notwithstanding that the EPA must consider energy requirements and ensure a reliable energy supply when it does so. 564 U.S. at 427. The Court explained that, when the EPA

is formulating greenhouse gas regulations, it must consider not only "the environmental benefit potentially achievable," but also "our Nation's energy needs and the possibility of economic disruption[.]" *Id.* The Clean Air Act "entrusts such complex balancing to EPA in the first instance, in combination with state regulators." *Id.*; *see* 42 U.S.C. § 7411(a)(1). That definitive reading of the statute by the Supreme Court cannot suddenly become a forbidden major question when the EPA regulates as it was told to do.

The statutory scheme simply gives no quarter to the proposition that, in following Congress' directive to regulate electricity-producing power plants, the EPA is categorically forbidden to consider emission-reduction measures that take into account the nature of the electricity grid in which those power plants operate day in and day out. Nor is it sensible to categorically put off-limits the generation-shifting measures that power plants are already actually using to meet emission requirements. *See* Clean Power Plan, 80 Fed. Reg. at 64,784–64,785.

The State and Industry Intervenors also overlook that the EPA developed the Clean Power Plan with input from other agencies with relevant expertise. *See* Clean Power Plan, 80 Fed. Reg. at 64,672–64,673 (explaining that "[i]nput and assistance from FERC [the Federal Energy Regulatory Commission] and DOE [the Department of Energy] have been particularly important in shaping" aspects of the Clean Power Plan); *id.* at 64,671 (noting "extensive consultation with key agencies responsible for [electric system] reliability[,]" as well as reliance on the "EPA's longstanding principles in setting emission standards for the utility power sector"). *Contrast Delaware Dep't of Nat. Res. & Env't Control v. EPA*, 785 F.3d 1, 14, 18 (D.C. Cir. 2015) (invalidating rule in part because the EPA had failed to consult with other expert agencies on grid

reliability issues). EPA could hardly do its job without substantively engaging with the on-the-ground facts about the electricity system that power plants support. Quite the opposite: An agency's wooden refusal to factor in reality and such on-point considerations would ordinarily render its decisionmaking arbitrary and capricious. *See Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto Ins. Co.*, 463 U.S. 29, 43 (1983).

All told, the EPA's consideration of already-in-use generation shifting as part of the "best system of emission reduction" does nothing to enlarge the Agency's regulatory domain. "We are not talking about extending EPA jurisdiction over millions of previously unregulated entities," but about a familiar process of cooperative federalism applied to "entities already subject to * * * regulation" to address a recognized form of air pollution that repeatedly has been found to endanger public health and welfare. *See UARG*, 573 U.S. at 332. The major questions doctrine cannot rescue the ACE Rule's mistaken interpretation of Section 7411(d) as categorically confining the best system of emission reduction to physical adjustments made only "at" and "to" the power plant.

C. FEDERALISM

The federalism canon lends no support to the ACE Rule's decision to confine the best system of emission reduction to measures that apply exclusively at and to the source. That canon recognizes that "the States retain substantial sovereign powers under our constitutional scheme, powers with which Congress does not readily interfere." *Gregory v. Ashcroft*, 501 U.S. 452, 460–461 (1991). So as a matter of constitutional avoidance, courts require Congress to "enact exceedingly clear language if it wishes to significantly alter the balance between federal and state power." *United States Forest Serv. v.*

Cowpasture River Pres. Ass'n, 140 S. Ct. 1837, 1849–1850 (2020).

The federalism clear-statement rule prevents direct federal intrusion into areas of traditional state responsibility unless Congress has made its intent to cross that line explicit. For example, courts will not assume that Congress meant to preempt a State's mandatory retirement age for state judges through the passage of a generic age discrimination law, unless it has clearly expressed its intent to police the qualifications of such high-level state officials. *See Gregory*, 501 U.S. at 463–464. Nor will courts lightly assume that Congress intended to claim state-owned land as part of the National Park System, *see Cowpasture River*, 140 S. Ct. at 1849–1850, to transform simple state-law assaults into breaches of international chemical weapons compacts, *see Bond v. United States*, 572 U.S. 844, 862–863 (2014), or to displace the States' traditional authority to regulate the practice of law, *see American Bar Ass'n v. FTC*, 430 F.3d 457, 466, 471–472 (D.C. Cir. 2005). Only when such conflicts between federal and state regulatory domains are plainly joined by Congress itself will the court confront the sensitive constitutional implications of such measures.

That doctrine does not support the EPA's cramped reading of Section 7411. Interstate air pollution is not an area of traditional state regulation. And federalism concerns do not bar the United States government from addressing areas of *federal* concern just because its actions have incidental effects on areas of state power. *Cf. FERC v. Electric Power Supply Ass'n*, 136 S. Ct. 760, 775–778 (2016) (federal regulation of wholesale electricity market did not intrude on traditional state authority over the retail electricity market, even though wholesale market regulation created an incentive for retail consumers to change their behavior in state-regulated markets).

What is more, the Supreme Court has suggested that the federalism clear-statement rule is of limited applicability when a federal regulatory regime is enforced through a statutory cooperative-federalism framework, as Section 7411(d) is. *See AT&T Corp. v. Iowa Util. Board*, 525 U.S. 366, 378 n.6 (1999) (noting appeals to States' rights as "most peculiar" in the context of "a federal program administered by 50 independent state agencies"); *see also Alaska Dep't of Env't Conservation v. EPA*, 540 U.S. 461 (2004) (declining to adopt dissent's proposed clear-statement rule for federal constraints on state implementation decisions in cooperative-federalism program). *See generally* Abbe Gluck, *Intrastatutory Federalism and Statutory Interpretation: State Implementation of Federal Law in Health Reform and Beyond*, 121 YALE L.J. 534, 555–556 (2011).

In any case, the Clean Power Plan's incorporation of generation shifting into its best system of emission reduction fell squarely within an area of the federal government's constitutional competence. The EPA does not dispute the government's authority or its statutory mandate to reduce the emission of pollutants that endanger public health and welfare. 42 U.S.C. § 7411(b)(1)(A), (d)(1). The EPA also agrees that greenhouse gases are among the pollutants properly regulated by the federal government. *See AEP*, 564 U.S. at 416–417, 424; *see also supra* Part I.B.2.

The Clean Power Plan directly regulated only the *amount* of greenhouse gas pollutants that may be emitted into the atmosphere. 80 Fed. Reg. at 64,663–64,664. That is an area of unique federal concern. After all, "[a]ir pollution is transient, heedless of state boundaries," *EME Homer City Generation*, 572 U.S. at 496, particularly where the pollutants are greenhouse gases, which have little if any localized effect but great cumulative impact. The inability of individual States

to redress the problem of interstate air pollution, in fact, was among the very reasons for the enactment of the Clean Air Act. *See* 42 U.S.C. § 7401(a)(1), (4); S. REP. NO. 88-638, at 3 (1963) ("Polluted air is not contained in a specific area but is carried from one political jurisdiction to another. It does not know State lines or city limits. Providing air of good quality * * * is a challenge and an obligation for Government operations on all levels."); *id.* at 5 ("The nationwide character of the air pollution problem requires an adequate Federal program to lend assistance, support, and stimulus to State and community programs.").

To be sure, the federal government's regulation of such an interstate problem can have indirect effects on State energy production and utility regulation decisions. But even when those effects are the fully anticipated "natural consequences" of an agency's policy choice, *Electric Power Supply Ass'n*, 136 S. Ct. at 776, that does not transform a fundamentally federal action in a core federal area of concern into a restriction on state action that triggers the federalism canon.[12]

The EPA protests that the Clean Power Plan breached that divide because it expressly considered generation shifting to

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[12] In the ACE Rule, the EPA suggested that the Clean Power Plan's best system of emission reduction was also impermissible as an encroachment on "measures and subjects exclusively left to FERC[.]" 84 Fed. Reg at 32,530. The EPA has not pressed that argument here. For good reason. The effects of environmental regulations on the power grid do not amount to power regulation statutorily reserved to FERC. And, in any event, the constitutional concerns that require us to patrol the boundaries between federal and state authority with vigilance do not support any similar clear-statement requirement regarding turf battles between federal agencies.

determine the best system of emission reduction and, in so doing, stepped on the States' power to regulate electrical utilities' mix of electricity generation. Reg.

But that argument has nothing to do with the narrow construction of Section 7411 that the EPA adopted. After all, the EPA could have set the same emission guidelines predicated on a best system of emission reduction that exclusively employed technological controls applicable at and to the source, like carbon capture and sequestration. And the EPA must agree that the federalism canon would play no role in determining the appropriateness of that system, since on the Agency's own reading, measures applicable at and to the source are precisely what Section 7411 allows.[13]

Nowhere does the EPA explain why reference to a different mechanism—generation shifting—in its calculation of the best system would raise materially different federalism

[13] While the EPA did not select carbon capture and sequestration as the best system of emission reduction in the ACE Rule, it excluded that process because of cost and feasibility concerns, not federalism interests. *See* 84 Fed. Reg. at 32,547–32,549. That exclusion was a change of position from the Clean Power Plan, where the EPA found that the process was "technically feasible and within price ranges that the EPA has found to be cost effective[.]" 80 Fed. Reg. at 64,727. Carbon capture and sequestration ultimately was not selected as the best system of emission reduction in the Clean Power Plan solely because generation shifting was even more cost-effective. *Id.* at 64,727–64,728. What matters here is that the EPA did not express any concern in either the ACE Rule or the Clean Power Plan that such a system would intrude upon traditional areas of State authority. In the ACE Rule, the EPA permits the use of such technological controls to meet its emission standards, 84 Fed. Reg. at 32,549, 32,555, as it did in the Clean Power Plan, 80 Fed. Reg. at 64,883–64,884.

concerns. Under either system, the only direct obligation imposed on States is the same: a federally set emissions guideline. In both scenarios, the States remain equally free to choose the compliance measures that best fit the needs of their State and industry. And as a practical matter, many if not most States would likely opt for generation shifting over carbon capture and sequestration under *either* rule because the former is cheaper for existing plants. *See* Clean Power Plan, 80 Fed. Reg. at 64,727–64,728; ACE Rule, 84 Fed. Reg. at 32,532 ("Market-based forces have already led to significant generation shifting in the power sector.").

The EPA also suggests that the clear-statement rule operates with particular force here because the Plan imposed uneven regulatory burdens weighted toward States with more high-emitting power plants. But that argument tries to twist principles of federalism into a command of regulatory homogenization that defies on-the-ground reality. Regulations under the Clean Air Act or any environmental law will commonly affect States differently depending on the States' activities. The regulation of pollutants associated with automotive manufacturing affects States with production facilities more than those without. *See, e.g.*, *General Motors Corp. v. United States*, 496 U.S. 530, 534–535 (1990). The regulation of mining-related pollutants imposes greater costs on States with more plentiful mineral resources. *See, e.g.*, *Alaska Dep't of Env't Conservation*, 540 U.S. at 469–470, 474; *Hodel v. Virginia Surface Mining & Reclamation Ass'n*, 452 U.S. 264, 289–290 (1981). The same point applies to industries like petroleum refining, which are concentrated near navigable waters. *See generally* EIA, *U.S. Energy Mapping System* https://www.eia.gov/state/maps.php (last visited Jan. 11, 2021). Indeed, some regulations impose additional regulatory burdens based literally on the direction the wind blows. *See EME Homer City Generation*, 572 U.S. at 520. Likewise,

States with more navigable water necessarily carry more burdens under the Clean Water Act than those with less.

Affected States, of course, could raise statutory challenges to enforce the Clean Air Act's express constraints, such as required consideration of cost, non-air quality health and environmental impact, or energy requirements under Section 7411(a). And they could always challenge any unreasoned or unwarranted distinctions in regulatory coverage as arbitrary or capricious. But in the absence of such an objection, it does not offend—or even implicate—principles of federalism to observe that States whose industries pollute the Nation's air and so harm the public's health more will, in turn, be affected more by emission controls.

For all of those reasons, nothing in the federalism canon supports the EPA's effort to categorically constrict the best system of emission reduction to measures physically applied at and to the individual plant.

III. THE EPA'S AUTHORITY TO REGULATE CARBON DIOXIDE EMISSIONS UNDER SECTION 7411

A. THE COAL PETITIONERS' CHALLENGES

The North American Coal Corporation and Westmoreland Mining Holdings LLC, both coal mine operators (the Coal Petitioners), bring two challenges to the ACE Rule. Both question the EPA's legal authority to enact the rule. First, the Coal Petitioners argue that the EPA failed to make the required endangerment finding—that carbon dioxide emissions from power plants cause or contribute significantly to air pollution that may reasonably be anticipated to endanger public health or welfare—before regulating those emissions. *See* 42 U.S.C. § 7411(b)(1)(A). Second, they claim that the EPA's previous regulation of a different air pollutant (mercury) from power

plants under the Hazardous Air Pollutants provision, 42 U.S.C. § 7412, precludes the EPA from now regulating power plants' emission of greenhouse gases under Section 7411(d).

Both arguments fail. The EPA made the requisite endangerment finding in 2015, and the ACE Rule expressly retained that finding. As for the Section 7412 challenge, the EPA has correctly and consistently read the statute to allow the regulation both of a source's emission of hazardous substances under Section 7412 and of other pollutants emitted by the same source under Section 7411(d). The Coal Petitioners' argument rests not on the enacted statutory language, but instead on their own favored reading of one statutory amendment inserted by codifiers. Reading the statutory text as a whole—that is, all of the relevant language enacted by Congress, including two duly enacted amendments—the Clean Air Act authorizes the EPA to regulate both power plants' emissions of greenhouse gases under Section 7411(d) and hazardous air pollutants under Section 7412. That reading is reinforced by the statutory structure, purpose, and history.

1. Endangerment Finding

a. The Record of Endangerment

The Coal Petitioners argue that the ACE Rule was unlawful right out of the box because the EPA failed to make a statutorily required finding that greenhouse gas emissions from power plants cause air pollution that endangers the public health and welfare. That is wrong.

As a reminder, before the EPA can regulate a category of stationary sources like electricity-generating power plants under Section 7411, the EPA Administrator must first find that the source category "in his judgment * * * causes, or contributes, significantly to, air pollution which may

reasonably be anticipated to endanger the public health or welfare." 42 U.S.C. § 7411(b)(1)(A). A formal pronouncement meeting those criteria is known as an "endangerment finding." New Source Rule, 80 Fed. Reg. at 64,529. And once it is made, the EPA is not just empowered, but obligated, to regulate. *See* 42 U.S.C. § 7411(b)(1)(A); *see also supra* note 8.

After the Administrator makes an endangerment finding, the source category is added to the EPA's Section 7411 list, 42 U.S.C. § 7411(b)(1)(A), and the Administrator must promulgate emissions standards (called "standards of performance") for *new* sources in the category, *id.* § 7411(b)(1)(B). As relevant here, unless those dangerous emissions are regulated under another relevant provision of the Clean Air Act, the Administrator must also set an achievable emission guideline based on the "best system of emission reduction" and provide a process for States to submit a plan setting out standards of performance for *existing* stationary sources in that same category. *Id.* § 7411(d)(1)(A)(ii).

The EPA has for decades been regulating emissions other than carbon dioxide from electricity-generating power plants. In 1971, the EPA listed fossil-fuel-fired electricity-generating units with steam-generating boilers as a new source category under Section 7411(b) and promptly established standards of performance for them. *See* Air Pollution Prevention and Control: List of Categories of Stationary Sources, 36 Fed. Reg. 5931 (March 31, 1971); Standards of Performance for New Stationary Sources, 36 Fed. Reg. 24,876, 24,878–24,880 (Dec. 23, 1971). Then, in 1977, the EPA listed fossil-fuel-fired combustion turbines as a new source category under Section 7411 and set performance standards for them. *See* Air Pollution Prevention and Control: Addition to the List of Categories of Stationary Sources, 42 Fed. Reg. 53,657 (Oct. 3,

1977); New Stationary Sources Performance Standards; Electric Utility Steam Generating Units, 44 Fed. Reg. 33,580 (June 11, 1979). These categories cover the power plants at issue today. *See* New Source Rule, 80 Fed. Reg. at 64,531.

Through the 2015 New Source Rule, the EPA began regulating carbon dioxide emissions from electricity-generating power plants. *See* New Source Rule, 80 Fed. Reg. 64,510. Because power plants had already been listed as a regulated source category, the New Source Rule did not need to take any action to add those plants to the Section 7411 list of regulated sources. It just issued, for the first time, standards of performance for carbon dioxide emitted from new power plants. In so doing, the New Source Rule provided the statutory predicate and corresponding duty for the EPA to establish carbon dioxide emission standards for existing power plants as well. Clean Power Plan, 80 Fed. Reg. at 64,715; *see* 42 U.S.C. § 7411(d)(1). The New Source Rule now serves that same function for the ACE Rule, 84 Fed. Reg. at 32,533.

Because the New Source Rule did not add a new category of pollution sources to the Section 7411 list, the EPA concluded that no new endangerment finding was needed. New Source Rule, 80 Fed. Reg. at 64,529–64,530. The EPA nevertheless went on to explain that it chose to regulate carbon dioxide emissions from electricity-generating plants specifically because greenhouse gas pollution endangers public health and welfare and contributes significantly to air pollution. *See id.* at 64,530–64,531. The EPA found in particular that increased atmospheric levels of greenhouse gases, including carbon dioxide, could lead to, among other things, more frequent extreme weather events and wildfires; threats to mental and physical health, especially for children and the elderly; reduced access to food and safe water; and mass

migrations and displacements as a result of rising sea levels. *Id.* at 64,517–64,520.

b. Timeliness

At the outset, the EPA argues that we must disregard the Coal Petitioners' challenge concerning the endangerment finding because it was not timely filed. This is a close question, but we ultimately conclude that the petition is timely.

The Clean Air Act requires that petitions for review challenging an EPA regulation—including any Section 7411 standard of performance—generally must be filed within 60 days of the regulation's publication in the Federal Register. 42 U.S.C. § 7607(b)(1). The Clean Air Act's timeliness bar is "jurisdictional in nature[.]" *Motor & Equip. Mfrs. Ass'n v. Nichols*, 142 F.3d 449, 460 (D.C. Cir. 1998) (quoting *Edison Elec. Inst. v. EPA*, 996 F.2d 326, 331 (D.C. Cir. 1993)).

Importantly, Congress carved out an exception to that 60-day time limit if the petition "is based solely on grounds arising after [the] sixtieth day[.]" 42 U.S.C. § 7607(b)(1). In that situation, the clock resets, and the petitioner must file within 60 days of the occurrence of the new event that "ripens [the] claim" and thereby triggers the basis for a challenge. *Coalition for Responsible Regulation, Inc. v. EPA*, 684 F.3d 102, 129 (D.C. Cir. 2012), *rev'd in part on other grounds sub nom. Utility Air Regulatory Group v. EPA* (*UARG*), 573 U.S. 302 (2014); *see also Alon Refining Krotz Springs, Inc. v. EPA*, 936 F.3d 628, 646 (D.C. Cir. 2019); *Honeywell Int'l, Inc. v. EPA*, 705 F.3d 470, 472–473 (D.C. Cir. 2013); *Sierra Club de Puerto Rico v. EPA*, 815 F.3d 22, 26 (D.C. Cir. 2016). A claim "ripens" for purposes of the Clean Air Act when "subsequent factual or legal development creat[es] new legal consequences" for the party seeking review. *Sierra Club de Puerto Rico*, 815

F.3d at 28. This type of delayed challenge is commonly referred to as an "after arising" claim.

We agree with the Coal Petitioners that the ACE Rule is an after-arising event that ripened their challenge to the New Source Rule's endangerment finding.

When the EPA promulgated the New Source Rule in 2015, the Coal Petitioners did not challenge that rule's endangerment finding.[14] That is because they did not plan "to build any new facilities affected by the New Source Rule," and so were not directly affected by it. Coal Pet'rs Reply Br. 3. But when the ACE Rule used the New Source Rule as the predicate for regulating existing coal-fired power plants, ACE Rule, 84 Fed. Reg. at 32,533, the Coal Petitioners became concretely aggrieved by the finding.

Under those circumstances, the Coal Petitioners' challenge to the New Source Rule as an insufficient predicate for the ACE Rule is timely. If the Coal Petitioners had filed suit when the New Source Rule was first promulgated in 2015, their standing would have been in doubt because they did not have any, or intend to build any, new power plants. An asserted injury arising from how the New Source Rule might come to

[14] The Coal Petitioners claim that there is no timeliness problem because two trade associations with which the Coal Petitioners are affiliated—the National Mining Association and the United States Chamber of Commerce—challenged the New Source Rule. Coal Pet'rs Reply Br. 3 & n.2. There is no evidence or declaration regarding that relationship in the record, aside from counsel's representation at oral argument. Oral Argument Tr. 131:13–17. Because we hold that the after-arising exception makes the Coal Petitioners' own challenge timely, we do not address the relevance, if any, of a prior trade association challenge.

affect the regulation of their existing plants in the future might well have been too speculative to support judicial review. *See Coalition for Responsible Regulation*, 684 F.3d at 115–116, 129–131 (challenge to preexisting regulations was timely, where regulations first affected petitioners due to the recent promulgation of rule targeting motor vehicle emissions); *see also Sierra Club de Puerto Rico*, 815 F.3d at 27; *Honeywell, Int'l*, 705 F.3d at 473. That is why "this court has assured petitioners with unripe claims that 'they will not be foreclosed from judicial review when the appropriate time comes,' * * * and that they 'need not fear preclusion by reason of the 60-day stipulation barring judicial review,'" as long as they file a petition within 60 days of the injury that ripened their claim. *Coalition for Responsible Regulation*, 684 F.3d at 131 (formatting modified).

The EPA urges that the Coal Petitioners could have pressed a challenge to the New Source Rule in 2015 at the latest, as other coal-related entities did, once the EPA promulgated the Clean Power Plan in reliance on the New Source Rule's endangerment finding. *See North Dakota v. EPA*, No. 15-1381 (and consolidated cases).

Perhaps. *See North American Coal Corp. v. EPA*, No. 15-1451 (D.C. Cir.) (consolidated with *West Virginia v. EPA*, No. 15-1363 (D.C. Cir.)). But that would argue over spilled milk. The Clean Power Plan litigation came to a halt when the EPA reconsidered that rule, and the case was ultimately dismissed as moot after the ACE Rule withdrew the Clean Power Plan. Per Curiam Order, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Sept. 17, 2019), ECF No. 1806952. The Coal Petitioners have raised their claim in the ACE Rule litigation, and it would

seem perverse to say they instead should have litigated the matter in a case that will never be decided.[15]

c. Adequacy of the Endangerment Finding

On the merits, the Coal Petitioners press a two-fold challenge to the EPA's compliance with the endangerment-finding requirement. First, they argue that Section 7411(b) requires the EPA to make a pollutant-specific endangerment finding for each stationary source category newly regulated under that provision. In their view, even though the EPA had already found that carbon dioxide emissions significantly cause or contribute to greenhouse gas air pollution that endanger the public health or welfare, the EPA also separately had to find that carbon dioxide specifically from coal-fired power plants is a significant source of that danger. 2009 Endangerment Finding, 74 Fed. Reg. at 66,499, 66,542 (for motor vehicles). Second, the Coal Petitioners claim that the EPA did not make such a finding, leaving it without authority to enact the ACE Rule.

We need not address the Coal Petitioners' first argument. Even assuming that Section 7411(b) requires a source-specific

[15] There is a second exception to the timeliness bar known as the "reopening rule." *See, e.g.*, *Environmental Def. v. EPA*, 467 F.3d 1329, 1333 (D.C. Cir. 2006). The gist of that rule is that the 60-day jurisdictional review window restarts when an agency, either explicitly or implicitly, reconsiders its former action. *See National Ass'n of Reversionary Prop. Owners v. Surface Transp. Bd.*, 158 F.3d 135, 141 (D.C. Cir. 1998); *National Mining Ass'n v. United States Dep't of Interior*, 70 F.3d 1345, 1351 (D.C. Cir. 1995). Because the after-arising ripeness exception preserves the Coal Petitioners' claim, we need not address the reopening doctrine.

endangerment finding for each pollutant, the EPA made a sufficient finding in the New Source Rule.

i. The New Source Rule

Before making the New Source Rule's endangerment finding keyed to carbon dioxide from new fossil-fuel-fired power plants, the EPA explained its "rational basis" for regulating those sources' emissions of that pollutant under Section 7411. New Source Rule, 80 Fed. Reg. at 64,530. The EPA first outlined why greenhouse gas emissions pose a danger to the public health and welfare, and then explained why it should regulate those emissions from power plants specifically.

For evidence of the harms posed by greenhouse gas air pollution, the EPA first pointed to its 2009 Endangerment Finding, made in connection with the motor vehicle emissions regulation at issue in *Coalition for Responsible Regulation*. New Source Rule, 80 Fed. Reg. at 64,530. There, this court upheld as reasonable the EPA's finding that greenhouse gas emissions threaten public health and welfare. *Id.*; *see also Coalition for Responsible Regulation*, 684 F.3d at 119–126.

In the 2015 New Source Rule, the Agency reviewed substantial scientific evidence, including contemporary studies from the National Research Council, the Intergovernmental Panel on Climate Change, and others that post-dated the record from the 2009 motor vehicle emissions regulation. 80 Fed. Reg. at 64,530–64,531; *see also id.* at 64,517–64,520 (detailing updated developments in scientific evidence). The EPA found that the new studies "len[t] further credence to the validity of the [2009] Endangerment Finding." *Id.* at 64,530. The EPA added that "[n]o information that commentators have presented or that the EPA has reviewed provides a basis for reaching a different conclusion," and that the science at the time had

reaffirmed its understanding of the effects of greenhouse gases on the public health and welfare. *Id.* "The facts," the EPA concluded, "unfortunately, have only grown stronger and the potential adverse consequences to public health and the environment more dire in the interim." *Id.* at 64,531.

The EPA next explained its reasons for regulating greenhouse gases from fossil-fuel-fired power plants specifically, pointing to the exceptionally high levels of emissions from those power plants. *See* New Source Rule, 80 Fed. Reg. at 64,522–64,523, 64,530. To that end, the EPA found that fossil-fuel-fired power plants are the largest stationary sources of greenhouse gas emissions in the United States, accounting for nearly one-third of the United States' greenhouse gas emissions and as much as three times the emissions from the next ten categories of stationary sources combined. *Id.* at 64,530. Coal-fired power plants in particular, the EPA added, are the largest of those large emitters, with just one coal-fired power plant emitting potentially millions of tons of carbon dioxide annually. *Id.* at 64,531. In that way, power plant emissions "far exceed[ed] in magnitude the emissions from motor vehicles," which had been the subject of the endangerment finding upheld in *Coalition for Responsible Regulation*. *Id.*

ii. All Required Findings Were Made

The Coal Petitioners acknowledge the EPA's findings, but argue that Section 7411 requires a two-part endangerment finding—that carbon dioxide from fossil-fuel-fired power plants (1) endangers the public health and welfare, and (2) causes or contributes significantly to greenhouse gas air pollution. *See* 42 U.S.C. § 7411(b)(1)(A) (findings must be for the "category of sources"). The Coal Petitioners do not contest

that carbon dioxide endangers the public health and welfare. *See* Oral Argument Tr. 129:21–22.

Instead, they train their arguments on the second prong, arguing that the New Source Rule did not properly make a finding that fossil-fuel-fired power plants "contribute[] significantly" to greenhouse gas pollution. First, they fault the EPA for relying on the New Source Rule, which provided a rational basis for regulation to support a significant-contribution finding.[16] Second, they argue that the EPA arbitrarily and capriciously failed to define the threshold measure of a "significant" contribution.

To survive those challenges, the EPA needed only to "articulate a satisfactory explanation" for the New Source Rule's endangerment finding, making a "rational connection between the facts found and the choice made." *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.* (*State Farm*), 463 U.S. 29, 43 (1983) (quoting *Burlington Truck Lines v. United States*, 371 U.S. 156, 168 (1962)). For an endangerment

[16] The Coal Petitioners also argue that the EPA was wrong to rely on the 2009 Endangerment Finding because it used the lower "more than a *de minimis or* trivial" contribution standard. Coal Pet'rs Br. (quoting 2009 Endangerment Finding, 74 Fed. Reg. at 66,542). But the New Source Rule relies on the 2009 Endangerment Finding only for part one of the endangerment finding test—that greenhouse gas pollution may reasonably be anticipated to endanger the public health and welfare—which the Coal Petitioners do not contest. *See* New Source Rule, 80 Fed. Reg. at 64,530–64,531. The EPA separately considered the volume of greenhouse gas emissions that motor vehicles contribute to the problem and found it significant. *See* 2009 Endangerment Finding, 74 Fed. Reg. at 66,499, 66,543; *Coalition for Responsible Regulation*, 684 F.3d at 128.

finding, that choice need not include a "precise numerical value" that defines the threshold at which air pollution endangers the public health and welfare. *Coalition for Responsible Regulation*, 684 F.3d at 326. Instead, a "'more qualitative' approach," employing reasoned predictions based on "empirical data and scientific evidence," may suffice. *Id.* at 327 (quoting *Ethyl Corp. v. EPA*, 541 F.2d 1, 56 (D.C. Cir. 1976)). Such an approach "is a function of the precautionary thrust of the [Clean Air Act] and the multivariate and sometimes uncertain nature of climate science, not a sign of arbitrary or capricious decision-making." *Id.* By that measure, both of the Coal Petitioners' objections fail.

For starters, it is perfectly permissible, and commendably efficient, for an agency to re-confirm and build consistently upon such formally made factual determinations. It makes eminent sense, for example, for the EPA to take what it learned in regulating automobiles' greenhouse gas emissions and apply that in evaluating the need for regulation of another source of the same pollutant—fossil-fuel-fired power plants. What matters here is that the EPA did not simply conclude that power plants' greenhouse gas emissions significantly contribute to air pollution and stop there. Instead, the EPA went on to explain *why* that significant-contribution finding was warranted. *See* New Source Rule, 80 Fed. Reg. at 64,530–64,531 (explaining that power plants are the largest stationary sources of domestic greenhouse gas emissions and that each coal-fired plant may emit millions of tons of carbon dioxide per year).

The Coal Petitioners' argument that the EPA failed to articulate a specific threshold measurement for significance fares no better. While the failure to identify the trigger point for significance might prove problematic in cases at the margins, the EPA sensibly found that this one is not even close. Because of their substantial contribution of greenhouse gases,

"under any reasonable threshold or definition," carbon dioxide from fossil-fuel-fired power plants represents "a significant contribution" to air pollution. New Source Rule, 80 Fed. Reg. at 64,531; *cf. Massachusetts v. EPA*, 549 U.S. at 525 (While domestic automobile emissions accounted for less than one-third of the United States' domestic emissions, "[j]udged by any standard, U.S. motor-vehicle emissions make a meaningful contribution to greenhouse gas concentrations and * * * to global warming.").

In that regard, we have already held that nothing in the Clean Air Act "require[s] that [the] EPA set a precise numerical value as part of" a contribution endangerment finding. *Coalition for Responsible Regulation*, 684 F.3d at 122 (applying Section 7521(a)(1) of the Clean Air Act). So the "EPA need not establish a minimum threshold of risk or harm before determining whether an air pollutant endangers." *Id.* at 123.

Nevertheless, the Coal Petitioners insist that, before finding significance, the EPA had to decide whether its inquiry would (1) address domestic or global emissions, (2) be measured by a "simple percentage criterion" or another metric, (3) factor in historical trends and/or future projections, and (4) involve a different process for greenhouse gases than other pollutants. *See* Coal Pet'rs Br. 17. Whether the EPA could reasonably decide to factor in such considerations is not before us. What matters here is that nothing in the Clean Air Act or precedent mandates determinations on each of those factors—at least not in a case in which there is no showing that any of them would have made any difference. Given that the United States, at the time of the endangerment finding, was the second-largest emitter of greenhouse gases in the world, *see* 2009 Endangerment Finding, 74 Fed. Reg. at 66,538, it was not arbitrary or capricious for the EPA to conclude that the source

of close to one-third of those emissions is a significant contributor to air pollution by any measure. The global nature of the air pollution problem means that "[a] country or a source may be a large contributor, in comparison to other countries or sources, even though its percentage contribution may appear relatively small" in the context of total emissions worldwide. *Id.* Looking just at the Coal Petitioners' calculations, power plants contributed a hefty 4.5 percent to global greenhouse gas emissions in 2013. *See* Coal Pet'rs Br. 18. More to the point, a holding that greenhouse gas emissions by fossil-fuel-fired power plants are not significant would make it nigh impossible for any source of greenhouse gas pollution to cross that statutory threshold.[17]

For those reasons, we hold that the New Source Rule's endangerment finding provided a sufficient basis for the EPA's promulgation of the ACE Rule.

2. Section 7411 and Section 7412's Parallel Operation

a. Background on the 1990 Amendments

The Coal Petitioners next argue that the Clean Air Act expressly and unambiguously prohibits the EPA from

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[17] The EPA recently solicited public comment through a proposed rule on the appropriateness of considering such factors when making a significant-contribution finding. *See* Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review, 84 Fed. Reg. 50,244, 50,269 (Sept. 24, 2019). But the EPA explained that the comments on the proposed rule are meant only "to inform the EPA's actions in future rules," *id.* at 50,267, and explicitly declined to consider the merits of the comments or adopt any of the factors in that final rule, *see* Oil and Natural Gas Sector: Emission Standards for New, Reconstructed,

regulating coal-fired power plants' carbon dioxide emissions under Section 7411(d) because those same power plants' mercury emissions are regulated under Section 7412's Hazardous Air Pollutants provision. The relevant statutory text says otherwise.

To set the stage, as relevant here, the Clean Air Act regulates pollutants emitted by stationary sources like power plants under three distinct programs: (1) the National Ambient Air Quality Standards (NAAQS) program that applies to emissions of six common air pollutants, 42 U.S.C. §§ 7408–7410; (2) the regulation of certain specified pollutants under the Hazardous Air Pollutants program, 42 U.S.C. § 7412; and (3) the regulation of all other dangerous pollutants from new and existing sources under Section 7411.

Congress designed the existing source provision in Section 7411(d) to ensure that there were "no gaps in control activities pertaining to stationary source emissions that pose any significant danger to public health or welfare." S. REP. NO. 91-1196, at 20 (1970). So Section 7411(d), in its gap-filling capacity, covers all dangerous pollutants except those already regulated by NAAQS or the Hazardous Air Pollutants provision. *See* Clean Air Act Amendments of 1990 ("1990 Amendments"), Pub. L. No. 101-549, § 108(g), § 302(a), 104 Stat. 2399, 2467, 2574.

From the passage of the Clean Air Act until its amendment in 1990, Congress had left substantially to the EPA the task of building a program to effectively identify and regulate hazardous air pollutants under Section 7412. Specifically, Section 7412(b)(1)(A)—Section 112(b)(1)(A) of the 1970

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and Modified Sources Review, 84 Fed. Reg. 57,018, 57,058 (Sept. 14, 2020).

Public Law—had instructed the EPA to publish a list of hazardous air pollutants that it would then regulate under Section 7412's terms. *See* Clean Air Act Amendments of 1970 ("1970 Amendments"), Pub. L. No. 91-604, sec. 4(a), § 112(b)(1)(A), 84 Stat. 1676, 1685. Section 7411(d), for its part, covered "any air pollutant * * * for which air quality criteria have not been issued or which is not included on a list published under section * * * 112(b)(1)(A)" by the EPA. *Id.*, sec. 4(a), § 111(d)(1)(A), 84 Stat. at 1684.

After two decades, Congress found that Section 7412 had "worked poorly" in that the EPA had regulated only eight hazardous pollutants under Section 7412. S. REP. NO. 102-228, at 128 (1989); *see id.* at 131. Through the 1990 Amendments to Section 7412, Congress forced the EPA's hand by statutorily designating 191 hazardous pollutants that Congress required the EPA to regulate. *See* 1990 Amendments, sec. 301, § 112(b)(1), 104 Stat. at 2532–2535 (codified at 42 U.S.C. § 7412(b)(1)); *see also* S. REP. NO. 102-228, at 133. Congress also called on the EPA to add to the list. 1990 Amendments, sec. 301, § 112(b)(2)–(3), 104 Stat. at 2535–2537 (codified at 42 U.S.C. § 7412(b)(2)–(3)). Neither greenhouse gases in general nor carbon dioxide in particular were on Congress' statutory list. Nor have they ever been added by the EPA.

That change to Section 7412(b) necessitated a corresponding technical change to Section 7411(d)'s carve-out of pollutants already regulated under the Hazardous Air Pollutants program, since the cross-referenced "list published under section * * * 112(b)(1)(A)" no longer existed. Congress' update of the statutory cross-reference is the root of the present dispute. That is because each chamber of Congress articulated

the technical correction differently, and yet both were enacted into law.

The Senate—in a section entitled "Conforming Amendments"—passed a straightforward amendment that struck "112(b)(1)(A)" from the Section 7411(d) exclusion, and replaced it with "112(b)"—which is the provision containing the new statutory list of hazardous pollutants to which the EPA could later add. 1990 Amendments, § 302(a), 104 Stat. at 2574. Just as before the 1990 Amendments, under the Senate Amendment, only hazardous pollutants on the Section 7412 list were excluded from Section 7411(d)'s regulation of existing sources' emissions, while dangerous pollutants not addressed by the Hazardous Air Pollutants or NAAQS programs remained in Section 7411(d)'s domain.

The House, for its part, called its technical amendment of the cross-reference "Miscellaneous Guidance," and it similarly deleted "112(a)(1)(B)[,]" and then excluded any air pollutant that is "emitted from a source category which is regulated under section 112." 1990 Amendments, § 108, 108(g), 104 Stat. at 2465, 2467.

Both of those amendments made it into the Conference Report, H.R. REP. NO. 101-952, at 73, 183 (1990) (Conf. Rep.), and, after being passed by both chambers of Congress and signed by the President, they both became part of the Public Law.

Congress' Office of the Legal Revision Counsel is tasked with compiling and codifying the public law and publishing it in the United States Code. The Counsel, of course, has no authority to alter the substance of the Statutes at Large. *See Ganem v. Heckler*, 746 F.2d 844, 851 (D.C. Cir. 1984) ("[T]he changes made by the codifiers, whose 'choice, made * * * without approval of Congress * * * should be given no weight,'

are of no substantive moment.") (internal quotation marks omitted) (quoting *North Dakota v. United States*, 460 U.S. 300, 310 n.13 (1983)); *see also Positive Law Codification*, OFFICE OF THE LAW REVISION COUNSEL, https://uscode.house.gov/codification/legislation.shtml (last visited Jan. 11, 2021) (For non-positive law titles, such as Title 42, "there are certain technical, although non-substantive, changes made to the text for purposes of inclusion in the Code.").

When faced with the Senate and House Amendments' differing articulations of the cross-reference update, the Counsel chose to publish only the House Amendment in the United States Code.

b. Interpreting the House and Senate Amendments

The Coal Petitioners argue that the House Amendment's technical update of the cross-reference actually worked a major substantive change in the law by categorically and unambiguously excluding from Section 7411 not the hazardous *pollutants* already regulated under Section 7412, but any *stationary sources* of hazardous pollutants regulated under Section 7412. In their view, once a source is subject to regulation under Section 7412 for any single listed hazardous pollutant, all of its other pollution emissions are off limits for regulation under Section 7411(d). More specifically, the Coal Petitioners' position is that, because the EPA regulates one hazardous air pollutant—mercury—emitted from coal-fired power plants, the EPA is powerless to regulate under Section 7411(d) every other non-"hazardous," but still

significantly dangerous, pollutant those same power plants emit, including greenhouse gases.[18]

On the other hand, for thirty years—from the enactment of the 1990 Amendments to the present day—the EPA has read the House's "Miscellaneous Guidance" as just that—a miscellaneous technical amendment that, like the Senate Amendment, simply updated the Section 7411(d) cross-reference to exclude the regulation of a stationary source's emission of pollutants that are already regulated under Section 7412.

For the Coal Petitioners' challenge to succeed, we would have to agree with their ambitious reading of the House Amendment as *precluding* regulation under Section 7411 of even those pollutants that are not covered by Section 7412. We also would have to ignore the duly enacted Senate Amendment entirely. And we would have to reject out of hand the EPA's three-decade-old harmonizing reading of the statutory amendments, the text of Section 7411(d), and the statutory structure. We decline the invitation because that is not how statutory interpretation works.

At the outset, the EPA seeks deference under *Chevron U.S.A. Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837 (1984). If this were an ordinary EPA interpretation of a Clean Air Act provision, we would apply exactly that framework. *See UARG*, 573 U.S. at 315 ("We review EPA's

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[18] *See* National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units, 77 Fed. Reg. 9304 (Feb. 16, 2012) (regulating mercury).

interpretations of the Clean Air Act using the standard set forth in *Chevron*[.]").

But this is no ordinary case. Here, the way in which the codifiers assembled the U.S. Code version of Section 7411(d) by omitting the Senate Amendment conflicts with the Statutes at Large, which is the definitive legal evidence of what the law is. 1 U.S.C. § 112; *see id.* § 204(a) (United States Code provides only *prima facie* evidence of the federal law). So any ambiguity arises from our duty to textually harmonize two duly enacted but differently articulated statutory provisions. In undertaking that task, we need not decide whether *Chevron* supplies the appropriate framework for reconciling conflicting statutory provisions. *Compare Scialabba v. Cuellar de Osorio*, 573 U.S. 41, 64 (2014) (Kagan, J.) (plurality opinion), *with id.* at 76 (Roberts, C.J.) (concurring in the judgment). Instead, we independently reach the same conclusion as the EPA, harmonizing the House and Senate Amendments by giving "full effect" to both. *Id.* at 64.

i. The Consistent Meaning of Both Amendments

In reconciling the Senate and House Amendments, we start with what the mission of the amendments was. The plain purpose of each amendment was to update Section 7411(d)'s outdated cross-reference to a list created by the EPA under Section 7412*(b)(1)(A)*, in light of Congress' publication of its new statutory list under Section 7412*(b)*. That is why the Senate labeled its provision a "[c]onforming [a]mendment," and the House called its version "[m]iscellaneous [g]uidance." *See* 1990 Amendments, § 302(a), 104 Stat. at 2574 (Senate Amendment); *id.* § 108(g), 104 Stat. at 2465, 2467 (House Amendment). Neither amendment was meant to work a major substantive change in the law.

The Senate took the most direct textual path to updating Section 7411(d)'s cross-reference. Using the Public Law section number for Section 7412 (that is, Section 112), the Senate Amendment simply substituted "section 112(b)" for the outdated reference to "section 112(b)(1)(A)." *See* 1990 Amendments, § 302(a), 104 Stat. at 2574. That way, the Senate Amendment maintains the parallelism of the two exclusions in Section 7411(d) for already-regulated pollutants that are either "included on a list published under section 108(a) [NAAQS] or 112(b) [the Hazardous Air Pollutants provision.]" *Id.* § 302(a), 104 Stat. at 2574 (incorporating Senate Amendment into the preexisting 1970 text, *see* 1970 Amendments, sec. 4(a), § 111(d)(1)(A), 84 Stat. at 1684). Both exclusionary clauses continue, as they had before the 1990 Amendments, to refer directly to specific air pollutants listed for regulation under other statutory provisions, and so to prevent duplicate regulation of the same harmful emissions.

The House Amendment was less efficient, but ended up in the same place. It substituted for "section 112(b)(1)(A)" the phrase an air pollutant that is "emitted from a source category which is regulated under section 112[.]" 1990 Amendments, § 108(g), 104 Stat. at 2467 (codified at 42 U.S.C. § 7411(d)(1)(A)(i)). So, with the House Amendment's phrasing, Section 7411(d)'s exclusion reads, as relevant here, that each State shall

> establish[] standards of performance for any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 7408(a) of this title [the NAAQS program] or emitted from a source category which is regulated under section 7412 of this title [the Hazardous Air Pollutant program] but (ii) to which a standard of performance under this section

> would apply if such existing source were a new source[.]

42 U.S.C. § 7411(d)(1)(A).

Reading the House Amendment within Section 7411(d)(1) "in [its] context and with a view to [its] place in the overall statutory scheme" shows that the House Amendment, like the Senate Amendment, just updated the cross-reference to exclude pollutant emissions already regulated for stationary sources under the Hazardous Air Pollutant program. *King v. Burwell*, 576 U.S. 473, 486 (2015) (quoting *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 132, 133 (2000)).

First, the entire point of the text that follows (i)—that is, romanette one—is to modify the phrase "air pollutant." "Air pollutant" is, in fact, the last antecedent to which all of the language in romanette one speaks. And grammatically, the last-antecedent rule means that a limiting phrase is generally read to "modify[] only the noun or phrase that it immediately follows." *Lockhart v. United States*, 136 S. Ct. 958, 962 (2016) (quoting *Barnhart v. Thomas*, 540 U.S. 20, 26 (2003)). In other words, the whole point of romanette one, including the House Amendment language, is to define which "air pollutant[s]" cannot be regulated under Section 7411(d) because those same pollutants are already regulated under the NAAQS or Hazardous Air Pollutants programs.

Second, reading the entirety of romanette one to modify "air pollutant" gives the updated cross-reference to Section 7412 full meaning.[19] *See UARG*, 573 U.S. at 317 (The

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[19] Contrary to the separate opinion's view, *see* Separate Op. 34, use of the term "source category" (rather than "list") leaves open whether the EPA might regulate, in its Section 7411(d) gap-filling

phrase "any air pollutant" in Section 7411 must be given "a reasonable, context-appropriate meaning[.]"). The EPA has regulated over 140 source categories under Section 7412. EPA Br. 180. But it regulates only their emission of hazardous pollutants. In other words, Section 7412's regulatory scheme operates not broadly on the source category, but only on its emissions of the specified air pollutants. So Section 7412 does not and cannot police a source category's every emission, only its emission of "hazardous" air pollutants. That is why it is called the Hazardous Air Pollutants program, not the Hazardous Sources program. Reading Section 7411(d) as excluding only those air pollutants already governed by Section 7412's emissions regulations maps exactly onto romanette one's parallel exclusion of pollutants (not sources) already regulated under NAAQS. *See* 42 U.S.C. § 7411(d)(1)(A)(i). And it fits with Section 7411's gap-filling purpose, which is to capture those dangerous air pollutants not covered by NAAQS or the Hazardous Air Pollutants program. *See* S. REP. NO. 91-1196, at 20.

Third, at the same time that Congress amended Section 7411(d), it also added a savings clause,

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capacity, the emission even of hazardous air pollutants listed under Section 7412 when emitted by sources that Section 7412 does not reach, but to which Section 7411 does apply, *see* 42 U.S.C. § 7412(c)(1), (3)–(6); *see also* Clean Power Plan, 80 Fed. Reg. at 64,714–64,715 (stating that "both the House and Senate amendments should be read individually as having the same meaning in the context presented in this rule," but that "it is reasonable to interpret the House amendment of the Section [7412] Exclusion as only excluding the regulation of [hazardous air pollutant] emissions under [Clean Air Act] section [7411(d)] *and only when that source category is regulated under* [*Clean Air Act*] *section* [*7412.*]") (emphasis added).

Section 7412(d)(7), to the Hazardous Air Pollutants provision. That provision says that "[n]o emission standard or other requirement promulgated under this section shall be interpreted, construed, or applied to diminish or replace * * * applicable requirements established pursuant to section [7411], part C or D[.]" 1990 Amendments, sec. 301, § 112(d)(7), 104 Stat. at 2540–2541 (codified at 42 U.S.C. § 7412(d)(7)). That language requires reading Section 7411(d)'s simultaneously enacted cross-reference to regulation under Section 7412 narrowly and consistently with Section 7411(d)'s complementary role in the statutory scheme. It certainly does not allow courts to read the cross-reference as the major amputation of authority to regulate that the Coal Petitioners propose.

ii. The House Amendment Is Not a Trojan Horse

The Coal Petitioners and the separate opinion eschew reading the House and Senate updates of the cross-reference harmoniously. They prefer to pit the House Amendment against the Senate Amendment and espy in the former a major change in the law that—without a word of warning or explanation—would have significantly curtailed the regulation of air pollutants and broadly insulated stationary sources from regulatory oversight for their non-hazardous but still-dangerously polluting emissions.

There is a litany of problems with that approach.

For starters, recall that the House and Senate Amendments were meant to address an outdated statutory cross-reference. It is not the function of a single chamber's miscellaneous guidance or conforming amendment of a cross-reference to materially overhaul or truncate a statutory provision's operative reach. Instead, reading both amendments together as serving the same purpose of cross-referencing a new statutory

list of air pollutants fits with their legislative purpose and text. To be sure, the Clean Air Act "is far from a *chef d'oeuvre* of legislative draftsmanship," but "we, and EPA, must do our best, bearing in mind the 'fundamental canon of statutory construction that the words of a statute must be read in their context and with a view to their place in the overall statutory scheme.'" *UARG*, 573 U.S. at 320 (quoting *Brown & Williamson*, 529 U.S. at 133).

More to the point, neither the House nor Senate Amendment said anything about changing the EPA's affirmative regulatory obligation under Section 7411(d) to promulgate emissions guidelines for all air pollutants, except those already regulated under the NAAQS or Section 7412. Yet reading the House Amendment as abruptly withdrawing from Section 7411(d)'s reach entire source categories and all of the otherwise-unregulated emissions they spew would put the House Amendment in direct conflict with not only the unambiguous language of the Senate Amendment, but also with the Clean Air Act's gap-filling structure and purpose, as well as with EPA's overarching regulatory obligation. And it would supposedly do all of that contrary to the statutory history, in defiance of the technical and updating nature of the two Amendments, and without a whisper of warning by a single House or Senate member that the miscellaneous guidance would cripple Section 7411's correlative function in the statutory scheme.

At best, the Coal Petitioners' and separate opinion's vision of the House Amendment would have the EPA's regulatory authority under Section 7411(d) turn on a fluke of timing. The Section 7412(d)(7) savings clause mentioned above, by its terms, protects the operation of Section 7411 regulations already in effect. So, too, does the House Amendment, which only excises what already "is regulated" under Section 7412.

Under the Coal Petitioners' approach, then, the Clean Air Act would allow the EPA to regulate sources under both Section 7411(d) and Section 7412 if, and only if, the EPA adopted its Section 7411(d) regulation *before* the Section 7412 regulation. No rational explanation is offered as to why Congress would want the mere sequencing of regulations to render them either lawful or invalid.

More to the point, the Coal Petitioners and the separate opinion point to nothing in the legislative record even *hinting* at a rationale for removing Section 7412 sources entirely from Section 7411's reach. Nothing suggests that Congress intended to veer off in that substantive legislative direction. The Senate certainly had no such intention.

The Coal Petitioners suggest that the EPA could instead regulate carbon dioxide under Section 7412. But they do not really mean it, as they say in the same breath that carbon dioxide would be a "poor fit" for Section 7412. Coal Pet'rs Br. 33 n.8. That is because Section 7412 strictly regulates all sources that emit ten tons per year or more of hazardous pollutants. 42 U.S.C. § 7412(a)(1). Adding carbon dioxide to that list would lead to a massive regulatory expansion of EPA authority to include everything from schools to hospitals and apartment buildings. *Cf. UARG*, 573 U.S. at 328. It would make no sense to conclude that Congress intended an unheralded string of words in a "Miscellaneous Guidance" amendment to hobble the gap-filling function of Section 7411(d) and to disable the EPA from addressing the source of one-third of this country's greenhouse gas emissions.

Nor can the Coal Petitioners hang their hats on the inclusion of the House Amendment in the codified version of Section 7411(d). Putting aside that the two amendments readily can, and so must, be read harmoniously as just updating

the exclusion of already-regulated air pollutants, it is settled that "the Code cannot prevail over the Statutes at Large when the two are inconsistent." *Stephan v. United States*, 319 U.S. 423, 426 (1943); *see also Five Flags Pipe Line Co. v. Department of Transp.*, 854 F.2d 1438, 1440 (D.C. Cir. 1988) ("[W]here the language of the Statutes at Large conflicts with the language in the United States Code that has not been enacted into positive law, the language of the Statutes at Large controls.").

The Coal Petitioners' and the separate opinion's other efforts to cast aside the Senate Amendment all fail.

First, the Coal Petitioners and the separate opinion point to the Chafee-Baucus Statement of Senate Managers, in which Senators Chafee and Baucus addressed the negotiations surrounding the "Miscellaneous Guidance" in the 1990 Amendments. Using this statement, the Coal Petitioners and the separate opinion try to brush off the duly enacted Senate Amendment as a scrivener's or drafter's error. To that end, they stress the Managers' statement that, in the "Conference agreement," the "Senate recedes to the House except * * * with respect to the requirement regarding judicial review of reports * * * and with respect to transportation planning[.]" 136 CONG. REC. 36,007, 36,067 (Oct. 27, 1990).

That argument does not even get out of the starting gate. It should go without saying that two Managers' description of what a report said does not override the Conference Report itself. And it surely cannot erase the Senate Amendment text that was enacted by both the House and the Senate, and signed into law by the President.

In fact, the Managers were wrong about what the Conference Report said. What the Conference Report actually says is that "the Senate recede[s] from its disagreement to the

amendment of the House to the text of the bill and agree to the same *with an amendment as follows*." H.R. REP. NO. 101-952, at 1 (Conf. Rep.) (emphasis added). The "amendment [that] follow[ed]" included the text of the Senate Amendment as well as the House Amendment. *See id.* at 73, 183. So the agreement retained the Senate Amendment language; the Senate plainly did not withdraw it. The accompanying joint explanatory statement of the Conference Committee confirms that the Senate receded to the House subject to this amendment, "which [was] a substitute for the Senate bill and the House amendment" and contained both the House and Senate Amendments at issue here. *See id.* at 335.

Beyond that, the Chafee-Baucus statement cannot bear the weight the Coal Petitioners and the separate opinion need it to carry. At most, as a "statement of managers," it purports to summarize the more than 800-page Conference Report. 136 CONG. REC. at 36,065. We generally do not view such statements as persuasive evidence of congressional intent, let alone an excuse for unceremoniously discarding unambiguous statutory text as a "drafter's error." *See* Separate Op. at 25 *cf. Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1052 n.67 (D.C. Cir. 1978). Not to mention that we have specifically ruled that this very same floor statement carries little weight. *Environmental Def. Fund, Inc. v. EPA*, 82 F.3d 451, 460 n.11 (D.C. Cir. 1996). Simply put, the statement's purpose was to explain the report, not to change the content of the law, to resolve substantive conflicts, or to effect sweeping change in the statute's reach. *See Glossary Term: Statement of Managers*, U.S. SENATE, https://www.senate.gov/reference/glossary_term/statement_of_managers.htm (last visited Jan. 11, 2021).

Second, the Coal Petitioners argue that we should disregard the Senate Amendment because it is a "[c]onforming

[a]mendment." *See* 1990 Amendments, § 302, 104 Stat. at 2574. A conforming amendment can serve to harmonize statutory provisions, which is exactly what the Senate Amendment did by updating the cross-reference. *See Burgess v. United States*, 553 U.S. 124, 135 (2008).

That does not mean that the statutory provision can be ignored. *See Burgess*, 553 U.S. at 135. The Senate Amendment's careful maintenance of the status quo through a cross-reference update evidences a deliberate preservation of the prior regulatory scope of Section 7411.

By the way, if labels were what matters, the House's "Miscellaneous *Guidance*" provides no platform for the major legislative surgery on Section 7411 that the Coal Petitioners and the separate opinion envision.

Third, the Coal Petitioners ask us to defer to the Office of the Law Revision Counsel's decision to codify the House Amendment rather than the Senate Amendment. The separate opinion reasons as well that the Office of Law Revision Counsel is "the leading candidate" for deference. Separate Op. 23.

No such deference is due. While the Office of the Law Revision Counsel has expertise in the technical aspects of the codification process, it has no license, without Congress' approval, to change the substantive meaning of enacted law or to throw away an entire statutory provision. *See Ganem*, 746 F.2d at 851. That is why the Public Law prevails over the United States Code in case of conflict. *See* 1 U.S.C. § 112; *Stephan*, 319 U.S. at 426; *United States v. Welden*, 377 U.S. 95, 98 n.4 (1964).

Fourth, the Coal Petitioners point to Congress' drafting manuals, which suggest that a first-in-time amendment, such as

the House Amendment, supersedes a later-in-the-legislative-process amendment like the Senate Amendment. *See* U.S. SENATE, OFFICE OF LEGISLATIVE COUNSEL, LEGISLATIVE DRAFTING MANUAL ("SENATE MANUAL") § 126(d) (1997) ("If, after a first amendment to a provision is made * * * , the provision is again amended, the assumption is that the earlier (preceding) amendments have been executed."); U.S. HOUSE OF REPRESENTATIVES, OFFICE OF LEGISLATIVE COUNSEL, HOUSE LEGISLATIVE COUNSEL'S MANUAL ON DRAFTING STYLE ("HOUSE MANUAL") § 332(d) (1995) ("The assumption is that the earlier (preceding) amendments have been executed.").

One problem is that the Coal Petitioners provide no evidence that those manuals or their provisions were in place at the time of the 1990 Amendments.

A bigger problem is that it is doubtful that the cited manual provisions even apply in this scenario. These provisions are located in sections for "Cumulative Amendments," in which an amended provision is added onto by later provisions. *See* SENATE MANUAL § 126(d); HOUSE MANUAL § 332(d). Both manuals suggest that language should be added to such a provision to "alert the reader" to the later amendments. SENATE MANUAL § 126(d); *see also, e.g.*, HOUSE MANUAL § 332(d)(1) (suggesting the following language for a cumulative amendment: "Title XX is amended by adding after section 123 (as added by section 802 of this Act) the following new section:"). That alert did not happen here. The House Amendment in Section 108 includes no reference to the Senate Amendment in Section 302, and there is no evidence that Congress believed it was adopting contradictory amendments in the final law.

The biggest problem of all is that nothing in the manuals says that a later but duly enacted amendment that has been signed into law can be cast aside as meaningless. Nor would it make any sense to do so here, when Congress placed the Senate Amendment in the logical statutory position to update a cross-reference to Section 7412. That amendment is located in the Public Law title addressing Hazardous Air Pollutants and is the very first provision (in Section 302 of the Public Law) that follows the many changes to Section 7412's Hazardous Air Pollutants program (in Section 301 of the Public Law). *See* 1990 Amendments, title III, sec. 301, § 112, 104 Stat. at 2531; *id.* sec. § 302(s), 104 Stat. at 2574. The House Amendment, on the other hand, appears as "[m]iscellaneous [g]uidance" in the title of the Public Law pertaining to the NAAQS program, not the Hazardous Air Pollutants program. *See* 1990 Amendments, title I, § 108(g), 104 Stat. at 2467.

Finally, the Coal Petitioners and the separate opinion insist that, by subsuming the Senate Amendment's targeted focus within their much broader reading of the House Amendment, they are somehow giving effect to both. *See* Coal Pet'rs Br. 29–30; Separate Op. 28–30. The separate opinion sees it as no different than if a father did not want to name a child after a president from Virginia, and a mother did not want to name the child after any president. There is no conflict there, as the separate opinion sees it, because the mother's sweeping prohibition includes "every name excluded by the father (and then some)." Separate Op. 29–30.

But, of course, it is the "and then some" that is the problem. By vastly overshooting the technical task of correcting a cross-reference, the separate opinion's and Coal Petitioners' proposed reading of the House Amendment is not "supplement[ing]" the Senate Amendment's exclusion of duplicate regulation. Separate Op. 30. It is supplanting it by

destroying the Senate Amendment's express preservation of Section 7411(d)'s pre-existing regulatory directive. To borrow the analogy, the separate opinion's vision of parental harmony is likely to be entirely lost on the father whose heart was set on naming his child Abraham, Theodore, or Harry.

The Coal Petitioners' and separate opinion's fundamental mistake in claiming to give effect to both Amendments is that the statute cannot mean both what the Senate Amendment says and what they think the House Amendment says: Section 7411(d) as amended in the 1990 Act cannot have simultaneously preserved and eliminated Section 7411(d)'s preexisting reach. As this case shows, the difference is quite material: It determines whether Section 7411(d) allows any regulation of power plants' greenhouse gas emissions or not. Given that, it blinks reality to claim that absorbing the Senate Amendment into the House Amendment in the manner the Coal Petitioners and the separate opinion propose somehow retains the Senate Amendment's independent effect. A mouse swallowed by a snake, while still present in some metaphysical way, hardly feels equally preserved.

At bottom, when confronted with two competing and duly enacted statutory provisions, a court's job is not to pick a winner and a loser. The judicial duty is to read statutory text as a harmonized whole, not to foment irreconcilability. *See Bell Atl. Tel. Cos. v. FCC*, 131 F.3d 1044, 1047 (D.C. Cir. 1997) ("Where, as here, we are charged with understanding the relationship between two different provisions within the same statute, we must analyze the language of each to make sense of the whole."). Reading both amendments consistently "pursue[s] a middle course" that "vitiates neither provision but implements to the fullest extent possible the directives of each[.]" *Citizens to Save Spencer Cnty. v. EPA*, 600 F.2d 844, 871 (D.C. Cir. 1979). Said another way, the better and quite

natural reading of all of the relevant enacted statutory text, structure, context, purpose, and history is one that harmonizes the House and Senate Amendments, avoids determining that one chamber of Congress smuggled dramatic and unlikely changes to the Agency's regulatory authority into the Act through miscellaneous "guidance," and instead faithfully accomplishes the legislative adjustment needed to respond to the changes to Section 7412.

iii. The Harmonized Reading Stands the Test of Time

Reading the two provisions consistently as successfully performing their "conforming" and "miscellaneous" task of updating Section 7411(d)'s cross-reference to continue to exclude air pollutants already regulated under Section 7412 also maps onto the EPA's consistent interpretation of the statute. And that reading has stood the test of time, without congressional correction. The EPA first announced its interpretation of Section 7411(d) as excluding Section 7412's hazardous pollutants, rather than source categories, in the immediate wake of the 1990 Amendments. *See* Standards of Performance for New Stationary Sources and Guidelines for Control of Existing Sources: Municipal Solid Waste Landfills, 56 Fed. Reg. 24,468, 24,469 (May 30, 1991) (explaining that Section 7411(d) requires States to submit plans for standards of performance for pollutants that endanger the public health or welfare but are "not 'hazardous' within the meaning of section 112 of the CAA and [are] not controlled under sections 108 through 110 of the CAA"). The EPA has not deviated from that interpretation in the ensuing decades. Oral Argument Tr. 174:19–22. The EPA's view also gives effect to Section 7411(d)'s gap-filling purpose, *see* S. REP. NO. 91-1196, at 20, by allowing it to continue to regulate dangerous pollutants that are not policed by Section 7412 or NAAQS.

The EPA's interpretation also dovetails with the development of judicial precedent. The Supreme Court has specifically addressed Section 7411(d)'s regulation of carbon dioxide emissions from fossil-fuel-fired power plants. In *American Electric Power Co. v. Connecticut* (*AEP*), the Supreme Court held that the Clean Air Act foreclosed any federal common law right to challenge the regulation (or lack thereof) of carbon dioxide emissions from power plants. 564 U.S. 410, 424–425 (2011). In so ruling, the Supreme Court relied on the displacing force of Section 7411, and specifically Section 7411(d). *Id.* In ruling that "the Clean Air Act and the EPA actions it authorizes displace any federal common-law right to seek abatement of carbon-dioxide emissions from fossil-fuel fired powerplants," the Supreme Court pointed directly to the Section 7411 regulatory scheme, including, "most relevant here, § 7411(d)." *Id.* at 424. The Supreme Court even noted that the "EPA is currently engaged in a § 7411 rulemaking to set standards for greenhouse gas emissions from fossil-fuel fired powerplants." *Id.* at 425. As the Supreme Court explained, Section 7411 "'speaks directly' to emissions of carbon dioxide from * * * [power] plants." *Id.* at 424.

The Coal Petitioners and the separate opinion put all their eggs in a footnote in *AEP* that notes Section 7411(d)'s exclusions. The footnote states that the "EPA may not employ § 7411(d) if existing sources of the pollutant in question are regulated under the national ambient air quality standard program, §§ 7408–7410, or the 'hazardous air pollutants' program, § 7412." *AEP*, 564 U.S. at 424 n.7. That footnote comports with the EPA's harmonized reading of the House and Senate Amendments because it says that Section 7411(d) does not apply when "the pollutant in question" is already regulated under one of the other two programs. *See* EPA Br. 189 (pointing out that the footnote's "use of the phrase 'of the

pollutant in question' suggests that [the Court] understood the regulatory bar to be pollutant-specific, consistent with EPA's interpretation").

The footnote could not mean otherwise. At the time of *AEP*, electricity-generating power plants as sources of different pollutants were already regulated under the NAAQS provisions. *See, e.g., American Trucking Ass'ns, Inc. v. EPA*, 283 F.3d 355, 359 (D.C. Cir. 2002) (considering NAAQS for particulate matter and ozone). So if the footnote did anything more than generally flag a statutory exclusion for already-regulated emissions—if it instead embraced the Coal Petitioners' and separate opinion's claim that Section 7411(d) excludes sources, rather than already-regulated emissions—then the Court could not have ruled as it did. Specifically, it could not have relied on Section 7411(d) to hold that the Clean Air Act displaced the common law by "speak[ing] directly" to the EPA's authority to regulate power plants' emission of greenhouse gases. *See AEP*, 564 U.S. at 424. The footnote certainly did not purport to unravel the central rationale for *AEP*'s holding.

* * *

For all of those reasons, we hold that Section 7411(d) allows the EPA to regulate carbon dioxide emissions from power plants, even though mercury emitted from those same power plants is regulated as a hazardous air pollutant under Section 7412.

B. THE ROBINSON PETITIONERS' CHALLENGES

Another group of petitioners—including the Texas Public Policy Foundation, the Competitive Enterprise Institute, and various businesses that petitioned jointly with a forest-services firm named Robinson Enterprises, Inc. (together, the Robinson

Petitioners)—challenge the ACE Rule as overstepping the EPA's authority. The Robinson Petitioners are the only parties that claim that the ACE Rule impermissibly regulates carbon dioxide emissions using Section 7411 of the Clean Air Act rather than Sections 7408 through 7410, under which the EPA sets NAAQS. Our ability to consider that claim fails due to the Robinson Petitioners' lack of standing.

The Robinson Petitioners assert the organizational standing of the Texas Public Policy Foundation and the Competitive Enterprise Institute, both nonprofit, nonpartisan organizations. Because the Foundation and the Institute seek the same relief on the same claim, only one needs to demonstrate standing. *See American Anti-Vivisection Soc'y v. United States Dep't of Agric.*, 946 F.3d 615, 619–620 (D.C. Cir. 2020). The two organizations argue standing based on harm to their own activities; neither appears to be a membership organization, and they claim no associational, or representational, standing based on harm to members.

To establish standing, an organization, like an individual, must show an actual or imminent injury in fact that is fairly traceable to the challenged action and likely to be redressed by a favorable decision. *See Havens Realty Corp. v. Coleman*, 455 U.S. 363, 378–379 (1982); *see also American Anti-Vivisection Soc'y*, 946 F.3d at 618. Because neither organization is directly subject to the challenged rule, their "standing is 'substantially more difficult to establish[.]'" *Public Citizen, Inc. v. National Highway Traffic Safety Admin.*, 489 F.3d 1279, 1289 (D.C. Cir. 2007) (Kavanaugh, J.) (quoting *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 562 (1992)).

Each organization proffers a distinct ground and theory of standing, so we analyze them in turn. The standing of both the Texas Public Policy Foundation and the Competitive

Enterprise Institute falters on the first factor, injury in fact, so we need not consider the remaining two factors.

The Texas Public Policy Foundation states that its mission is to provide legal counseling and services on a broad swath of matters, including promoting "a balanced approach to environmental regulation" by providing "legal counseling, referral, and advocacy services to individuals and businesses injured by federal, state, or local government overreach[.]" Decl. of Greg Sindelar ¶¶ 5, 7 ("[Its] mission is to promote, defend, and ensure liberty, personal responsibility, property rights, criminal justice reform, greater educational opportunities for all, a balanced approach to environmental regulation, free speech, state's rights under the 10th Amendment, energy sufficiency, and free enterprise[.]"). The Foundation's attorneys litigate cases on a wide range of issues on behalf of clients and refer clients to private counsel when necessary. *Id.* ¶ 8. The Foundation claims that the challenged rule has "caused a drain on [its] resources because [it] has had to divert significant time, effort, and resources from [its] activities in the area of property rights and wetlands regulation, for example," in order to represent clients "who are forced to deal with" the federal regulation of greenhouse gases. *Id.* ¶ 9.

It is well established that injury to an organization's advocacy activities does not establish standing. *See, e.g.*, *Center for Law & Educ. v. Department of Educ.*, 396 F.3d 1152, 1162 n.4 (D.C. Cir. 2005) (citing *Sierra Club v. Morton*, 405 U.S. 727, 739–740 (1972)). That is because "the expenditure of resources on advocacy is not a cognizable Article III injury." *Turlock Irrigation Dist. v. FERC*, 786 F.3d 18, 24 (D.C. Cir. 2015). To hold otherwise "would eviscerate standing doctrine's actual injury requirement" by permitting an interest group to generate its own standing merely by putting an issue in its lawyers' crosshairs. *Id.* (quoting *Center for Law*

& Educ., 396 F.3d at 1162 n.4); *see also National Taxpayers Union, Inc. v. United States*, 68 F.3d 1428, 1434 (D.C. Cir. 1995). The Texas Public Policy Foundation declares only that, since the EPA issued the ACE Rule, it has increased its legal counseling, referral, and advocacy on behalf of clients affected by the regulation of greenhouse gases rather than other clients. That is precisely the kind of injury to advocacy—and expenditure of resources on such efforts—that we have held does not amount to injury in fact.

The Foundation does not show the kind of perceptible impairment to its mission that sufficed for standing in a case like *American Anti-Vivisection Society*. There, we found injury because the agency's inaction—specifically, its failure to promulgate standards regarding the humane treatment of birds—deprived the organization of key information on which its public educational activities depended. *See* 946 F.3d at 619. That inaction compelled the organization to develop guidance for the public that otherwise would have been provided by the agency's standards. *Id.* By contrast, the Foundation fails to allege impairment of any similarly "discrete programmatic concerns" aside from its non-cognizable advocacy activities. *National Taxpayers Union*, 68 F.3d at 1433 (quoting *American Legal Found. v. FCC*, 808 F.2d 84, 92 (D.C. Cir. 1987)).

The Foundation points to *Abigail Alliance for Better Access to Developmental Drugs v. Eschenbach*, 469 F.3d 129 (D.C. Cir. 2006), in arguing that the cost associated with more legal counseling, referral, and advocacy services is a source of injury. But the "counseling, referral, advocacy, and educational services" at issue in *Abigail Alliance* were *medical* services, not legal services, and they directly furthered the plaintiff's mission of providing access to potentially life-saving medical drugs and treatments. *See id.* at 132–133. The Foundation's transplantation of *Abigail Alliance*'s words into

the context of legal representation and counseling cannot change the outcome: the costs of litigation are not a cognizable Article III organizational injury. *See Turlock*, 786 F.3d at 24.

The Competitive Enterprise Institute claims a different injury, which also falls short: the risk that it will face higher electricity bills. The Institute works to counter "economic overregulation in areas ranging from technology and finance to energy and the environment," Decl. of Kent Lassman ¶ 3, and avers that it relies on electricity to power its headquarters in Washington, D.C., *id.* ¶¶ 2, 4. It says that the Regulatory Impact Analysis for the ACE Rule shows that the Rule could increase its electricity costs. That analysis estimated a 0.0% to 0.1% increase in average retail electricity prices nationwide attributable to the Rule between 2025 and 2035. *See* S.A. 220 (projecting baseline prices, in cents per kilowatt-hour, of 10.49 and 10.71 in 2025 and 2030, respectively, as compared to 10.50 and 10.72 under the ACE Rule, and estimating no increase attributable to the ACE Rule by 2035).

The Regulatory Impact Analysis that the Institute cites modeled one "illustrative policy scenario on retail electricity prices[,]" S.A. 220, and included the caveat that the estimates were based on "inadequate and incomplete information[,]" meaning that "costs could be lower[,]" S.A. 222. The analysis acknowledged that "the EPA has not analyzed or modeled a specific standard of performance," and recognized that costs could vary depending on "how states might apply the [best system of emission reduction] taking account of source-specific factors in setting standards of performance, and how sources might comply with those standards." S.A. 221–222. It also identified "several key areas of uncertainty related to the electric power sector[,]" including electricity demand, natural gas supply and demand, and longer-term planning by utilities. S.A. 222.

Even a small injury may suffice to support standing, *see, e.g.*, *Competitive Enter. Inst. v. FCC* (*CEI*), 970 F.3d 372, 384 (D.C. Cir. 2020), but it must be "concrete and particularized and actual or imminent, not conjectural or hypothetical," *id.* at 381 (quoting *Spokeo, Inc. v. Robins*, 136 S. Ct. 1540, 1548 (2016)). "Were all purely speculative increased risks deemed injurious, the entire requirement of actual or imminent injury would be rendered moot, because all hypothesized, nonimminent injuries could be dressed up as increased risk of future injury." *Public Citizen*, 489 F.3d at 1294 (quoting *Natural Res. Def. Council v. EPA*, 464 F.3d 1, 6 (D.C. Cir. 2006)).

In recognition that standing must rest on a concrete injury that is at least imminent, "we have repeatedly held that litigants cannot establish an Article III injury based on the independent actions of some third party not before this court." *Turlock*, 786 F.3d at 25 (formatting modified) (quoting *Florida Audubon Soc'y v. Bentsen*, 94 F.3d 658, 670 (D.C. Cir. 1996) (en banc)). "This is because 'predictions of future events (especially future actions taken by third parties)' are too speculative to support a claim of standing." *Id.* (quoting *United Transp. Union v. ICC*, 891 F.2d 908, 912 (D.C. Cir. 1989)).

The remoteness and contingency of the prospect that the Competitive Enterprise Institute will in the future actually face even the tiny rate increase *tentatively* projected as possibly arising from the challenged ACE Rule renders its claimed injury speculative and thus defeats its standing. In particular, the effect the Institute anticipates on its future electricity rates depends on how third parties—such as electricity generators, electricity providers, public utility commissions, and state pollution control agencies—might react to the ACE Rule. *See* EPA Br. 192. It also turns on the nature of standards that States decide to set, and on the compliance choices of regulated

sources. *Id.* It remains entirely unclear what standards States would develop in response to the "best system of emission reduction," how and whether those standards would have any effect on the costs of generation and transmission of energy, and whether rates will be affected by any offsetting savings through state or federal support for different generation mixes. A theory that "stacks speculation upon hypothetical upon speculation * * * does not establish an 'actual or imminent' injury." *Turlock*, 786 F.3d at 24 (quoting *New York Reg'l Interconnect, Inc. v. FERC*, 634 F.3d 581, 587 (D.C. Cir. 2011)); *see Arpaio v. Obama*, 797 F.3d 11, 20–23 (D.C. Cir. 2015). In asking us to anticipate the future actions of various third parties that are not before us, the Institute does just that.

At oral argument, the Competitive Enterprise Institute identified as its strongest support our decision in *Competitive Enterprise Institute v. FCC*. But the concrete and actual injury claimed there was traceable through "a relatively simple causal chain[,]" 970 F.3d at 383, unlike the harm asserted here, which is based on "inadequate and incomplete information[,]" S.A. 222, and dependent on third parties' unpredictable responses to the ACE Rule. Critically, the plaintiffs there demonstrated that their internet prices in fact had increased since the agency took its challenged action. *CEI*, 970 F.3d at 382–383. This record lacks any such evidence.

Because neither the Texas Public Policy Foundation nor the Competitive Enterprise Institute shows injury in fact to support the Robinson Petitioners' standing, we cannot address the merits of their NAAQS-related challenge to the ACE Rule.

IV. AMENDMENTS TO THE IMPLEMENTING REGULATIONS

When the EPA repealed the Clean Power Plan and finalized the ACE Rule, it also changed the longstanding implementing regulations generally applicable to emission

guidelines promulgated under Section 7411(d) of the Clean Air Act. *See* ACE Rule, 84 Fed. Reg. at 32,564–32,571. The Public Health and Environmental Organization Petitioners (the Public Health Petitioners) challenge the implementing regulations insofar as they adopt new timing requirements that substantially extend the preexisting schedules for state and federal actions and sources' compliance under Section 7411(d). *See* 40 C.F.R. §§ 60.23a(a)(1), 60.27a(b), 60.27a(c), 60.24a(d); *see also* ACE Rule, 84 Fed. Reg. at 32,567. Because the challenged regulations lack reasoned support, they cannot stand.

The new implementing regulations extend the time allowed for States to submit their plans, for the EPA to review those plans, for the Agency to promulgate federal plans where state plans fall short, and for legally enforceable consequences to attach to sources that are slow to comply. Those extended timeframes apply unless the EPA otherwise specifies with respect to particular emission guidelines. *See* ACE Rule, 84 Fed. Reg. at 32,568. The Public Health Petitioners argue that the amendments are arbitrary and capricious because the Agency altogether failed to address the urgency of controlling harmful emissions—especially the greenhouse gas emissions accelerating climate change.

At the threshold, the EPA asserts that the Public Health Petitioners forfeited any challenge to the amended implementing regulations, but we conclude the claim was preserved. The EPA contends that Petitioners "barely mention" this claim in their opening brief, EPA Br. 268–269 (citing *CTS Corp. v. EPA*, 759 F.3d 52, 60 (D.C. Cir. 2014)), but it was adequately, if concisely, set forth, *see* Pub. Health & Env't Orgs. Br. 11–13. The issue is neither particularly complex nor as momentous as others in the case; Petitioners nonetheless clearly stated and supported the claim with

citations to the record and sources of legal authority. *Id.* That relatively abbreviated treatment suffices. *See, e.g.*, *Tribune Co. v. FCC*, 133 F.3d 61, 69 n.8 (D.C. Cir. 1998) (noting one paragraph in a fifty-eight-page brief arguing that the agency's action was arbitrary and capricious sufficed to preserve the claim).

Petitioners' joint comment on this amendment as the EPA proposed it in the rulemaking process, which Petitioners cite in their brief, provides more detail. *See* Pub. Health & Env't Orgs. Br. 13 (citing Comments of Environmental and Public Health Organizations on Proposed Revisions to Emission Guideline Implementing Regulations 26–27, J.A. 973–974). The EPA well understands the nature of the claim, *see* EPA Br. 268–269, and there is no indication the brevity of the discussion in Petitioners' opening brief prejudiced the Agency at all. *Cf. Avia Dynamics, Inc. v. Federal Aviation Admin.*, 641 F.3d 515, 521 (D.C. Cir. 2011) (forfeiture excused where federal agency was placed on notice of arguments by extensive substantive motion practice).

On the merits, the EPA failed to justify substantially extending established compliance timeframes, including deadlines that it has had in place since 1975. *See* State Plans for the Control of Certain Pollutants from Existing Facilities, 40 Fed. Reg. 53,340, 53,345, 53,346–53,348 (Nov. 17, 1975). Before we can sustain agency action as nonarbitrary under the APA, "the agency must * * * articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (quoting *Burlington Truck Lines v. United States*, 371 U.S. 156, 168 (1962)). Petitioners' comments took issue with the tepid justifications the Agency offered, but the heart of their challenge is the EPA's complete failure to say

anything at all about the public health and welfare implications of the extended timeframes.

The Agency principally relied on reviving an argument it had considered and rejected when it first adopted the schedule it now displaces: that timeframes for the regulation of existing sources under Section 7411(d) should necessarily mimic or exceed timeframes for adoption of National Ambient Air Quality Standards (NAAQS) under Section 7410 of the Clean Air Act. *Compare* ACE Rule, 84 Fed. Reg. at 32,568, *with* State Plans for the Control of Certain Pollutants from Existing Facilities, 40 Fed. Reg. at 53,345. Section 7411(d) calls for regulations that "establish a procedure similar to that provided by [S]ection 7410[,]" which, like Section 7411, requires States to submit plans for the EPA's approval and, if those plans are either not submitted or fall short, requires the EPA to itself prescribe a plan. *See* 42 U.S.C. § 7410(a)(1), (c)(1); *id.* § 7411(d)(1)–(2). The two sets of rules accordingly reflect generally similar state-federal interactions.

But it is not evident that the statement that Section 7411(d) would use "a procedure similar" to that employed under Section 7410 even speaks to timing rules. As the Agency recognized when it promulgated the 1975 rule, faster compliance was appropriate under Section 7411(d) because plans under this provision are far simpler. They apply only to a single category of source, whereas state plans for NAAQS under Section 7410 cover multiple types of sources. *See* 40 Fed. Reg. at 53,345 (commenting that "Section [7411](d) plans will be much less complex than the [state implementation plans]" required under Section 7410). The Public Health Petitioners' comment on the 2018 proposed amendments to the implementing regulations explained that "a section [7410 state implementation plan] must ensure that ambient air concentrations of a given pollutant in the state will stay below

the EPA-designated standard." J.A. 971. That goal is "far more complicated to both achieve and demonstrate" than limiting source emissions under Section 7411(d), because "meeting the ambient air quality standards involves air quality monitoring, complex modeling procedures, close attention to such factors as topography, wind patterns, cross-[border] transport of air pollution, and many other considerations." J.A. 971. By the same token, Petitioners commented that the EPA failed to justify giving itself as much time to review the simpler Section 7411(d) plans as it has to review state plans under Section 7410. J.A. 971–972. The EPA failed to engage meaningfully with the different scale of the two types of plans, dismissing Petitioners' comment with the conclusory assertion that Section 7411(d) plans "have their own complexities and realities that take time to address." ACE Rule, 84 Fed. Reg. at 32,568.

The EPA's proposed rule also relied on more general claims that the amended timelines are appropriate because of the amount of work involved in States' plan development and in the EPA's review of those plans. *See* Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guideline Implementing Regulations; Revisions to New Source Review Program: Proposed Rule, 83 Fed. Reg. 44,746, 44,771 (Aug. 31, 2018). In response, Petitioners commented that the EPA did not document any problems during the decades that the existing timelines had been in place. J.A. 972 ("If the agency is truly concerned that the timing provision[s] in the framework regulations are unworkable, it must provide actual evidence of this—which it has not done thus far—and must propose amended provisions that correspond to the actual workload involved in section [7411(d)] rulemakings[.]"). The Final Rule failed to fill that gap. *See, e.g.*, ACE Rule, 84 Fed. Reg. at 32,568. Indeed, the Agency at one point seemed to forget that

it even had a burden of justification under the APA, going so far as to suggest that the obligation was somehow on the *commenters* to show that the various actors do *not* need any additional time. *Id.*

It might be a close call whether, viewed in isolation, the analogy to Section 7410 and the general claim of need for more processing time could supply the "rational connection" the APA requires. *State Farm*, 463 U.S. at 43. But we do not view those reasons in isolation.

The EPA's weak grounds for routinizing additional compliance delays in the amended implementing regulations are overwhelmed by its total disregard of the added environmental and public health damage likely to result from slowing down the entire Section 7411(d) regulatory process. "Normally, an agency rule would be arbitrary and capricious if the agency * * * entirely failed to consider an important aspect of the problem[.]" *State Farm*, 463 U.S. at 43. The extensions of implementation deadlines here give no consideration to the need for speed. Control of emissions from existing sources before they harm people and the environment is the central purpose of Section 7411(d) of the Clean Air Act. Yet when it deferred the compliance deadlines, the EPA did not even mention the need for prompt reduction of those emissions or the human and environmental costs of its substantial new delay.

In their comments, Petitioners emphasized the gravity and urgency of impending harms from unlawfully uncontrolled emissions as a reason the EPA must retain the tighter timeframes in the existing rule, not promulgate a new rule to build in additional years of delay. *See* Comments of Environmental and Public Health Organizations on Proposed Revisions to Emission Guideline Implementing Regulations 26–27, J.A. 973–974. They stressed in particular the broad and

longstanding scientific consensus on the role of carbon dioxide emissions in accelerating climate change, and insisted that "deep emission reductions are needed immediately" in order to avoid "the worst effects of climate change," making time "of the utmost essence." *Id.* They explained how the timing amendments stymie effective control of carbon dioxide emissions:

> [T]he amendments in question would permit up to 60 months to elapse between the time an EPA emission guideline is finalized and the time that affected sources must, at a minimum, begin reducing their emissions through enforceable increments of progress. Assuming EPA issues a final emission guideline for power plant [carbon dioxide] emissions in mid-2019, designated sources can be expected to start reducing emissions in mid-2024. * * * [T]he world has surpassed not only the 350 ppm threshold—that atmospheric concentration of [carbon dioxide] that is considered the maximum safe level—but the 400 ppm threshold as well. If we are to avoid the worst effects of climate change, deep emission reductions are needed immediately: time is simply of the utmost essence. For EPA to inject even *further* delay into the process * * * flouts the agency's Clean Air Act obligation to require emission reductions to prevent this endangerment to public health and welfare.

Comments of Environmental and Public Health Organizations 27, J.A. 974.

Not all source categories or types of emissions subject to Section 7411(d) present problems of the magnitude and urgency of those posed by unregulated carbon dioxide

emissions from power plants. But the Public Health Petitioners' comments on the Agency's proposed amendments to the implementing regulations squarely called on the EPA to explain how slowing the regulatory timeframe with respect to *any* covered emissions or source category might be justified and consistent with the Act's objective. *See* Comments of Environmental and Public Health Organizations 23, J.A. 970.

In response to Petitioners' concrete objections, the final rule neither changed nor better justified the timing provisions. In fact, upon reading the rule's explanation of the deadline extensions, one would have no idea that the EPA actually recognized that greenhouse gas pollution was causing a global climate crisis requiring urgent remediation. In finalizing the proposed extensions to key deadlines, the EPA tersely reiterated its stated interest in giving itself, States, and regulated parties more time to comply—despite no showing of need—and, contrary to its explanation of the rule it displaced, stated that it was important after all to align the timing of the Section 7411(d) state-plan process with the compliance schedule under Section 7410. *See* ACE Rule, 84 Fed. Reg. at 32,564, 32,568.

The EPA did not even hint at how or whether it determined that prolonging public exposure to ongoing harms from pollutants emitted by existing source categories could be justified consistent with the core objectives of the Clean Air Act. That failure is irrational, especially in the face of the EPA's continued adherence to its 2015 finding of an urgent need to counteract the threats posed by unregulated carbon dioxide emissions from coal-fired power plants. The EPA made no mention whatsoever of the harms that Petitioners warned would result if the Agency slackened the pace of state and federal action to mitigate the harms Section 7411(d) targets. In relation to the timing amendments, pollution

control—whether in the context of carbon dioxide and the ACE Rule or air pollution more generally—was simply not on the EPA's agenda. In short, Petitioners called the EPA's attention to an important aspect of the regulatory problem, and the EPA looked away.

The EPA offered what is at best a radically incomplete explanation for extending the compliance timeline. It offered undeveloped reasons of administrative convenience and regulatory symmetry, even as it ignored the environmental and public health effects of the Rule's compliance slowdown. The EPA thus "failed to consider an important aspect of the problem," *State Farm*, 463 U.S. at 43—indeed, arguably the most important aspect. We accordingly vacate the implementing regulations' extensions of the Section 7411(d) compliance periods.

V. VACATUR AND REMAND

The ACE Rule expressly rests on the incorrect conclusion that the plain statutory text clearly foreclosed the Clean Power Plan, so that complete repeal was "the only permissible interpretation of the scope of the EPA's authority under [Section 7411]." ACE Rule, 84 Fed. Reg. at 32,534; *see also id.* at 32,532. "[T]hat error prevented it from a full consideration of the statutory question here presented." *Negusie v. Holder*, 555 U.S. 511, 521 (2009). "Where a statute grants an agency discretion but the agency erroneously believes it is bound to a specific decision, we [cannot] uphold the result as an exercise of the discretion that the agency disavows," *United States v. Ross*, 848 F.3d 1129, 1134 (D.C. Cir. 2017), and the "regulation must be declared invalid, even though the agency might be able to adopt the regulation in the exercise of its discretion," *Prill v. NLRB*, 755 F.2d 941, 948 (D.C. Cir. 1985) (quoting *Planned Parenthood Federation of America,*

Inc. v. Heckler, 712 F.2d 650, 666 (D.C. Cir. 1983) (Bork, J., concurring in part and dissenting in part)); *accord Arizona v. Thompson*, 281 F.3d 248, 259 (D.C. Cir. 2002) (quoting *Prill*, 755 F.2d at 948).

Because the ACE Rule rests squarely on the erroneous legal premise that the statutory text expressly foreclosed consideration of measures other than those that apply at and to the individual source, we conclude that the EPA fundamentally "has misconceived the law," such that its conclusion "may not stand." *SEC v. Chenery Corp.*, 318 U.S. 80, 94 (1943). Accordingly, we hold that the ACE Rule must be vacated and remanded to the EPA so that the Agency may "consider the question afresh in light of the ambiguity we see." *Negusie*, 555 U.S. at 523 (quoting *Cajun Elec. Power Coop., Inc. v. FERC*, 924 F.2d 1132, 1136 (D.C. Cir. 1991)); *accord Peter Pan Bus Lines, Inc. v. Federal Motor Carrier Safety Admin.*, 471 F.3d 1350, 1354 (D.C. Cir. 2006); *Prill*, 755 F.2d at 948.

VI. CONCLUSION

Because promulgation of the ACE Rule and its embedded repeal of the Clean Power Plan rested critically on a mistaken reading of the Clean Air Act, we vacate the ACE Rule and remand to the Agency. We also vacate the amendments to the implementing regulations that extend the compliance timeline. Because the objections of the Coal Petitioners are without merit, we deny their petitions. And because the Robinson Petitioners lack standing, their petition is dismissed.

So Ordered.

WALKER, *Circuit Judge*, concurring in part, concurring in the judgment in part, and dissenting in part: This case concerns two rules related to climate change. The EPA promulgated both rules under § 111 of the Clean Air Act.[1]

A major milestone in climate regulation, the first rule set caps for carbon emissions. Those caps would have likely forced shifts in power generation from higher-polluting energy sources (such as coal-fired power plants) to lower-emitting

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[1] When this opinion refers to § 111, it is specifically referring to § 111(d). The codified version of § 111(d) is titled "Standards of performance for existing sources; remaining useful life of source." 42 U.S.C. § 7411(d). The first part reads:

> (1) The Administrator shall prescribe regulations which shall establish a procedure similar to that provided by section 7410 of this title under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 7408(a) of this title or emitted from a source category which is regulated under section 7412 of this title but (ii) to which a standard of performance under this section would apply if such existing source were a new source, and (B) provides for the implementation and enforcement of such standards of performance. Regulations of the Administrator under this paragraph shall permit the State in applying a standard of performance to any particular source under a plan submitted under this paragraph to take into consideration, among other factors, the remaining useful life of the existing source to which such standard applies.

Id.

sources (such as natural gas or renewable energy sources).[2] That policy is called generation shifting.

Hardly any party in this case makes a serious and sustained argument that § 111 includes a clear statement unambiguously authorizing the EPA to consider off-site solutions like generation shifting. And because the rule implicates "decisions of vast economic and political significance," Congress's failure to clearly authorize the rule means the EPA lacked the authority to promulgate it.[3]

The second rule repealed the first and partially replaced it with different regulations of coal-fired power plants. Dozens of parties have challenged both the repeal and the provisions replacing it.

In my view, the EPA was required to repeal the first rule and wrong to replace it with provisions promulgated under § 111. That's because coal-fired power plants are already regulated under § 112, and § 111 excludes from its scope any power plants regulated under § 112. Thus, the EPA has no authority to regulate coal-fired power plants under § 111.

I.

When the Constitution's ratifiers empowered Congress to legislate on certain matters of national importance,[4] they understood that federal regulation came with risks. For example, Congress might impose widely disbursed costs to

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[2] For ease of reading, this opinion refers to the technical term "coal-fired electric utility generating units" by the slightly less precise but lay-friendlier term "coal-fired power plants."

[3] *Utility Air Regulatory Group v. EPA*, 573 U.S. 302, 324 (2014) (quoting *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 160 (2000)).

[4] U.S. CONST. art. I, § 8.

benefit insular groups in a nation of diverse economic and political interests. The framers called those groups factions.[5]

To guard against factions, legislation requires something approaching a national consensus. While a single state's simple majority can often subject that state to "novel social and economic experiments,"[6] federal legislation must survive bicameralism and presentment.[7] Only through that process can ideologically aligned states use federal power to impose their will on the unwilling.[8] So too for ideologically aligned environmentalists. Or polluters. Or big tech. Or big labor. Or free traders. Or fair traders. Or farmers. Or fishers. Or butchers. Or bakers.

In that process, each political institution probes legislative proposals from the perspective of different constituencies.[9] The House speaks for the people. The Senate, among other roles, guards the interests of small states. The Electoral College, with representation just short of proportional, strikes a balance between the two. And by staggering elections over two-, four-, and six-year cycles, we further impede fleeting factions from ganging up on small states and unpopular political minorities. The point is: It's difficult to pass laws — on purpose.

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[5] *See* The FEDERALIST No. 10, at 56-65 (J. Madison) (J. Cooke ed., 1961).

[6] *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting).

[7] U.S. CONST. art. I, §§ 1, 7; *see INS v. Chadha*, 462 U.S. 919, 951 (1983).

[8] Of course, even then, a legislative coalition cannot regulate outside Congress's enumerated powers. *See* U.S. CONST. art. I, § 8.

[9] *See Department of Transportation v. Association of American Railroads*, 575 U.S. 43, 61 (2015) (Alito, J., concurring) ("Our Constitution, by careful design, prescribes a process for making law, and within that process there are many accountability checkpoints.").

This legislative gauntlet sometimes produces unfortunate, even tragic, consequences. Between the 1870s and 1960s, it foreclosed desperately needed civil rights laws. For budget hawks who predict a fiscal crisis, it has blocked entitlement reform. And for those who fear a climate crisis, it has prevented clear congressional guidance on how to cool the planet and who will foot the bill.[10]

That, however, is the price we pay for bicameralism and presentment. Major regulations and reforms either reflect a broad political consensus, or they do not become law.

In its clearest provisions, the Clean Air Act evinces a political consensus. For example, according to *Massachusetts v. EPA*, carbon dioxide is clearly a pollutant, and the Act's § 202 unambiguously directs the EPA to curb pollution from new cars.[11]

But for every carbon question answered in that case, many more were not even presented.[12] For example, does the Clean Air Act force the electric-power industry to shift from fossil fuels to renewable resources? If so, by how much? And who will pay for it? Even if Congress could delegate those decisions, *Massachusetts v. EPA* does not say where in the Clean Air Act Congress clearly did so.

In 2009, Congress tried to supply that clarity through new legislation.

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[10] *Cf. Bowsher v. Synar*, 478 U.S. 714, 722 (1986) ("That this system of division and separation of powers produces conflicts, confusion, and discordance at times is inherent, but it was deliberately so structured to assure full, vigorous, and open debate on the great issues affecting the people and to provide avenues for the operation of checks on the exercise of governmental power.").

[11] 549 U.S. 497, 532-35 (2007).

[12] In this opinion, "carbon" is used as shorthand for carbon dioxide and other greenhouse gases.

The House succeeded.[13]

The President supported it.[14]

But that effort stalled in the Senate.[15]

Since climate change is real, man-made, and important, Congress's failure to act was, to many, a disappointment. But the *process* worked as it was designed.[16] In general, Senators from small states blocked legislation they viewed as adverse to their voters.[17] And because small states have outsized influence in the Senate,[18] no bill arrived on the President's

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[13] American Clean Energy and Security Act, H.R. 2454, 111th Cong. (2009).

[14] *See Interview with President Obama on Climate Bill*, N.Y. TIMES (June 28, 2009), https://www.nytimes.com/2009/06/29/us/politics/29climate-text.html.

[15] *See* Richard Cowan & Thomas Ferraro, *Senator Graham Calls Cap-and-Trade Plan Dead*, REUTERS (Mar. 2, 2010, 2:26 PM), https://www.reuters.com/article/us-climate-usa-congress/senator-graham-calls-cap-and-trade-plan-dead-idUKTRE62142T20100302.

[16] *Cf. Association of American Railroads*, 575 U.S. at 61 (Alito, J., concurring) ("Bicameralism and presentment make lawmaking difficult *by design*[.]") (cleaned up).

[17] Due to opposition to the 2009 climate bill, it never received a Senate vote. The closest analogue is the 2008 climate bill, which received a cloture vote. And of the states with no Senator voting for the 2008 bill, most of those states have populations smaller than 1/50 of the nation. *Roll Call Vote 110th Congress – 2nd Session,* U.S. SENATE, https://www.senate.gov/legislative/LIS/roll_call_lists/roll_call_vote_cfm.cfm?congress=110&session=2&vote=00145#state (all internet materials last visited Jan. 10, 2021).

[18] In 2008, *see supra*, for twenty-four state delegations, there was no Senate opposition to the climate bill. That's short of a majority of state delegations, and well short of the 3/5 necessary to break a

desk. Nor have dozens of other climate-related bills introduced since then.[19]

So President Obama ordered the EPA to do what Congress wouldn't.[20] In 2015, after "years of unprecedented outreach

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filibuster. But those twenty-four states equal 60% of the population. So the Senate's equal-state representation was critical. If representation were proportional to population, the climate bill would have been more likely to pass. *Roll Call Vote 110th Congress – 2nd Session,* U.S. SENATE, https://www.senate.gov/legislative/LIS/roll_call_lists/roll_call_vote_cfm.cfm?congress=110&session=2&vote=00145#state.

[19] *See, e.g.*, American Clean Energy and Security Act, H.R. 2454, 111th Cong. (2009); Integrated Energy Systems Act, S. 2702, 116th Cong. (2019); Clean Industrial Technology Act, S. 2300, 116th Cong. (2019); Advancing Grid Storage Act, H.R. 7313, 115th Cong. (2018); Climate Risk Disclosure Act, S. 3481, 115th Cong. (2018); American Energy and Conservation Act, S. 3110, 114th Cong. (2016); Climate Solutions Commission Act, H.R. 6240, 114th Cong. (2016); Super Pollutants Act, S. 2911, 113th Cong. (2014); American Renewable Energy and Efficiency Act, H.R. 5301, 113th Cong. (2014); End Polluter Welfare Act, S. 3080, 112th Cong. (2012); Save Our Climate Act, H.R. 3242, 112th Cong. (2011); Carbon Dioxide Capture Technology Prize Act, S. 757, 112th Cong. (2011); Clean Energy Standard Act, S. 20, 111th Cong. (2010).

[20] Evan Lehmann & Nathanael Massey, *Obama Warns Congress to Act on Climate Change, or He Will*, SCIENTIFIC AMERICAN (Feb. 13, 2013), https://www.scientificamerican.com/article/obama-warns-congress-to-act-on-climate-change-or-he-will/ ("'But if Congress won't act soon to protect future generations, I will,' Obama said. 'I will direct my Cabinet to come up with executive actions we can take, now and in the future, to reduce pollution, prepare our communities for the consequences of climate change, and speed the transition to more sustainable sources of energy.'").

and public engagement"[21] — including 4.3 million public comments[22] (about 4.25 million more than in *Massachusetts v. EPA*)[23] — the EPA promulgated a rule aimed at "leading global efforts to address climate change."[24]

Entitled the Clean Power Plan, the EPA's rule used the Clean Air Act's § 111 to set limits for carbon emissions that would likely be impossible to achieve at individual coal-fired power plants because of costs, unavailable technologies, or a need to severely reduce usage.[25] In that sense, the limits required generation shifting: shifting production from coal-fired power plants to facilities that use natural gas or renewable resources.

To be clear, the 2015 Rule did not expressly say, "Power plants must adopt off-site solutions." But it did set strict emission limits in part by considering off-site solutions. And those emission limits would likely have been unachievable or too costly to meet if off-site solutions were off the table.

A political faction opposed generation shifting. It challenged the 2015 Rule in this Court, arguing that § 111 does not allow the EPA to consider off-site solutions when determining the best system of emission reduction. The faction included about twenty-four states, represented by many

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[21] *FACT SHEET: Overview of the Clean Power Plan*, EPA, https://archive.epa.gov/epa/cleanpowerplan/fact-sheet-overview-clean-power-plan.html.
[22] *Id.*
[23] 549 U.S. at 511.
[24] *FACT SHEET: Overview of the Clean Power Plan*, EPA, https://archive.epa.gov/epa/cleanpowerplan/fact-sheet-overview-clean-power-plan.html.
[25] Respondents' Br. at 32-37. For the codified text of § 111(d), see the first footnote of this opinion.

Senators who opposed the 2009 legislation.[26] Conversely, a political faction of about eighteen states defended the rule. Many of their Senators had supported the stymied legislation.[27]

At that litigation's outset, our Court refused to stay the rule's implementation.[28] But in an unprecedented intervention, the Supreme Court did what this Court would not.[29] And through its stay, the Supreme Court implied that the challengers would likely succeed on the case's merits.[30]

Taking the Supreme Court's not-so-subtle hint, in 2019 President Trump's EPA repealed the 2015 Rule and issued the Affordable Clean Energy Rule. Like the rule it replaced, the 2019 Rule relies on the Clean Air Act's § 111 to reduce carbon emissions. But unlike its predecessor, the 2019 Rule did not include generation shifting in its final determination of the best system of emission reduction.

A new faction then challenged the 2019 Rule. It looked a lot like the faction that had defended the 2015 Rule. Arrayed against that faction were many states and groups that had opposed the old rule. And so once again, politically diverse

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[26] *See* Legislative Hearing on S. 1733, Clean Energy Jobs and American Power Act Before the Committee on Environment and Public Works, 111th Cong. (2009) (For example, Senators from Oklahoma, Ohio, Wyoming, and Louisiana expressed opposition or concern about the legislation.).

[27] *See id.* (For example, Senators from California, Massachusetts, Minnesota, New Mexico, Oregon, Rhode Island, Vermont, and Maryland expressed support for the legislation.).

[28] *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Jan. 21, 2016) (per curiam) (order).

[29] *West Virginia v. EPA*, 136 S. Ct. 1000 (2016) (mem.).

[30] *See Winter v. Natural Resources Defense Council*, 555 U.S. 7, 20 (2008).

states and politically adverse special interest groups brought their political brawl into a judiciary designed to be apolitical.

In this latest round, the briefing's word count exceeded a quarter of a million words. The oral argument lasted roughly nine hours. The case's caption alone runs beyond a dozen pages. And yet, in all that analysis, hardly any of the dozens of petitioners or intervenors defending the 2015 Rule make a serious and sustained argument that § 111 includes a clear statement unambiguously authorizing the EPA to consider a system of emission reduction that includes off-site solutions or that § 111 otherwise satisfies the major-rules doctrine's clear-statement requirement. Neither does the EPA.

In light of that,[31] I doubt § 111 authorizes the 2015 Rule — arguably one of the most consequential rules ever proposed by an administrative agency:

- It required a "more aggressive transformation in the domestic energy industry," marking for President Obama a "major milestone for his presidency."[32]
- It aspired to reduce that industry's carbon emissions by 32 percent — "equal to the annual emissions from more than 166 million cars."[33]

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[31] *Cf.* ARTHUR CONAN DOYLE, *Silver Blaze*, *in* THE COMPLETE SHERLOCK HOLMES 312, 325 (2009) ("Before deciding that question I had grasped the significance of the silence of the dog, for one true inference invariably suggests others.").

[32] J.A. 2076 (White House Fact Sheet).

[33] *FACT SHEET: Clean Power Plan By The Numbers*, EPA, https://archive.epa.gov/epa/cleanpowerplan/fact-sheet-clean-power-plan-numbers.html; *What Is the Clean Power Plan?*, NATIONAL RESOURCES DEFENSE COUNCIL, INC. (Sept. 29, 2017), https://www.nrdc.org/stories/how-clean-power-plan-works-and-why-it-

- Leaders of the environmental movement considered the rule "groundbreaking,"[34] called its announcement "historic,"[35] and labeled it a "critically important catalyst."[36]

The potential costs and benefits of the 2015 Rule are almost unfathomable. Industry analysts expected wholesale electricity's cost to rise by $214 billion.[37] The cost to replace shuttered capacity? Another $64 billion.[38] ("A billion here, a billion there, and pretty soon you're talking real money."[39])

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matters#:~:text=According%20to%20EPA%20projections%2C%20by,nationally%2C%20relative%20to%202005%20levels.&text=The%20shift%20to%20energy%20efficiency,its%20electricity%20bills%20in%202030 ("According to EPA projections, by 2030, the Clean Power Plan would cut the electric sector's carbon pollution by 32 percent nationally, relative to 2005 levels.").

[34] *Save the Clean Power Plan*, NATIONAL RESOURCES DEFENSE COUNCIL, INC., https://www.nrdc.org/save-clean-power-plan.

[35] *The Clean Power Plan*, ENVIRONMENTAL DEFENSE FUND, https://www.edf.org/clean-power-plan-resources.

[36] Press Release, Michael Brune, Sierra Club Executive Director, *Repealing the Clean Power Plan Will Threaten Thousands of Lives* (Oct. 9, 2017), https://www.sierraclub.org/press-releases/2017/10/repealing-clean-power-plan-will-threaten-thousands-lives.

[37] *EPA's Clean Power Plan An Economic Impact Analysis*, NMA, 2, http://nma.org/attachments/article/2368/11.13.15%20NMA_EPAs%20Clean%20Power%20Plan%20%20An%20Economic%20Impact%20Analysis.pdf.

[38] *Id.*

[39] *Senator Everett McKinley Dirksen Dies*, U.S. SENATE (Sept. 7, 1969), https://www.senate.gov/artandhistory/history/minute/Senator_Everett_Mckinley_Dirksen_Dies.htm; *cf. id.* ("Researchers have been unable to track down the quotation most commonly associated with

True, you can dismiss that research as industry-funded. But the EPA itself predicted its rule would cost billions of dollars and eliminate thousands of jobs.[40]

On the benefits side of the ledger, the White House labeled the 2015 Rule a "Landmark,"[41] and the President called it "the single most important step America has ever taken in the fight against global climate change."[42] With that in mind, calculating the rule's benefits requires a sober appraisal of that fight's high stakes. According to the rule's advocates, victory over climate change will lower ocean levels; preserve glaciers; reduce asthma; make hearts healthier; slow tropical diseases; abate hurricanes; temper wildfires; reduce droughts; stop many floods; rescue whole ecosystems; and save from extinction up to "half the species on earth."[43]

Dirksen. Perhaps he never said it, but the comment would have been entirely in character.").

[40] J.A. 336; *see, e.g.*, *Regulatory Impact Analysis for the Clean Power Plan Final Rule*, EPA, 6-25 (Oct. 23, 2015), https://19january2017snapshot.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf.

[41] Fact Sheet: President Obama to Announce Historic Carbon Pollution Standards for Power Plants, THE WHITE HOUSE (Aug. 3, 2015), https://obamawhitehouse.archives.gov/the-press-office/2015/08/03/fact-sheet-president-obama-announce-historic-carbon-pollution-standards.

[42] Andrew Rafferty, *Obama Unveils Ambitious Plan to Combat Climate Change*, NBC NEWS (Aug. 3, 2015, 3:05 PM), https://www.nbcnews.com/politics/barack-obama/obama-unveils-ambitious-plan-combat-climate-change-n403296.

[43] *FACT SHEET: Overview of the Clean Power Plan*, EPA, https://archive.epa.gov/epa/cleanpowerplan/fact-sheet-overview-clean-power-plan.html; Al Gore, *Al Gore: The Climate Crisis Is the Battle of Our Time, and We Can Win*, N.Y. TIMES (Sept. 20, 2019), https://www.nytimes.com/2019/09/20/opinion/al-gore-

These are, to put it mildly, serious issues. Lives are at stake. And even though it's hard to put a dollar figure on the net value on what many understandably consider invaluable, the EPA tried: $36 billion, it said, give or take about a $10-billion margin of error.[44]

So say what you will about the cost-benefit analysis behind generation shifting, it's hardly a minor question. Minor questions do not forestall consequences comparable to "the extinction event that wiped out the dinosaurs 65 million years ago."[45] Minor questions are not analogous to "Thermopylae, Agincourt, Trafalgar, Lexington and Concord, Dunkirk, Pearl Harbor, the Battle of the Bulge, Midway and Sept. 11."[46] Minor rules do not inspire "years of unprecedented outreach and public engagement."[47] Minor rules are not "the single most

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climate-change.html; *Effects of Climate Change*, WORLD WILDLIFE FUND, https://www.worldwildlife.org/threats/effects-of-climate-change.

[44] *FACT SHEET: Overview of the Clean Power Plan*, EPA, https://archive.epa.gov/epa/cleanpowerplan/fact-sheet-overview-clean-power-plan.html.

[45] AN INCONVENIENT TRUTH (Lawrence Bender Productions, 2006) ("Global warming, along with the cutting and burning of forests and other critical habitats, is causing the loss of living species at a level comparable to the extinction event that wiped out the dinosaurs 65 million years ago. That event was believed to have been caused by a giant asteroid. This time it is not an asteroid colliding with the Earth and wreaking havoc: it is us.").

[46] Al Gore, *Al Gore: The Climate Crisis Is the Battle of Our Time, and We Can Win*, N.Y. TIMES (Sept. 20, 2019), https://www.nytimes.com/2019/09/20/opinion/al-gore-climate-change.html; *see id.* ("This is our generation's life-or-death challenge.").

[47] *FACT SHEET: Overview of the Clean Power Plan*, EPA, https://archive.epa.gov/epa/cleanpowerplan/fact-sheet-overview-clean-power-plan.html.

important step America has ever taken in the fight against global climate change."[48] Minor rules do not put thousands of men and women out of work.[49] And minor rules do not calculate $10 billion in net benefits as their margin of error.[50]

Rather, the question of how to make this "the moment when the rise of the oceans began to slow and our planet began to heal"[51] — and who should pay for it — requires a "decision[] of vast economic and political significance."[52] That standard is not mine. It is the Supreme Court's. And no cocktail of factors informing the major-rules doctrine can obscure its ultimate inquiry: Does the rule implicate a "decision[] of vast economic and political significance"?

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[48] Andrew Rafferty, *Obama Unveils Ambitious Plan to Combat Climate Change*, NBC NEWS (Aug. 3, 2015, 3:05 PM), https://www.nbcnews.com/politics/barack-obama/obama-unveils-ambitious-plan-combat-climate-change-n403296.

[49] *See, e.g.*, *Regulatory Impact Analysis for the Clean Power Plan Final Rule*, EPA, 6-25 (Oct. 23, 2015), https://19january2017snapshot.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf.

[50] *FACT SHEET: Overview of the Clean Power Plan*, EPA, https://archive.epa.gov/epa/cleanpowerplan/fact-sheet-overview-clean-power-plan.html.

[51] Barack Obama, *Barack Obama's Remarks in St. Paul*, N.Y. TIMES (June 3, 2008), https://www.nytimes.com/2008/06/03/us/politics/03text-obama.html.

[52] *Utility Air Regulatory Group*, 573 U.S. at 324 (quoting *Brown & Williamson Tobacco*, 529 U.S. at 160) (cleaned up); *see Gonzales v. Oregon*, 546 U.S. 243, 267 (2006) (quoting *Brown & Williamson Tobacco*, 529 U.S. at 160) (cleaned up).

Proponents of the 2015 Rule say it doesn't.[53] They have to. If it did, it's invalid — because a clear statement is missing.[54] And according to the Supreme Court, that is exactly what a major rule requires.

To be sure, if we frame a question broadly enough, Congress will have always answered it. Does the Clean Air Act direct the EPA to make our air cleaner? Clearly yes. Does it require at least some carbon reduction? According to *Massachusetts v. EPA*, again yes.

But *how* should the EPA reduce carbon emissions from power plants? And *who* should pay for it? To those major questions, the Clean Air Act's answers are far from clear.

I admit the Supreme Court has proceeded with baby steps toward a standard for its major-rules doctrine. But "big things have small beginnings."[55] And even though its guidance has been neither sweeping nor precise, the Supreme Court has at least drawn this line in the sand: Either a statute clearly endorses a major rule, or there can be no major rule.[56]

Moreover, if Congress merely *allowed* generation shifting (it didn't), but did not clearly *require* it, I doubt doing so was constitutional. For example, imagine a Congress that says, "The EPA *may* choose to consider off-site solutions for its best system of emission reduction, but the EPA may choose *not* to consider off-site solutions." In that instance, Congress has

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[53] *See* Oral Arg. Tr. at 23 (Counsel for State and Municipal Petitioners on the 2015 Rule: "We do not think it implicates the Major Questions Doctrine here for a couple of reasons.").

[54] *See supra* p. 9.

[55] LAWRENCE OF ARABIA (Columbia Pictures, 1962).

[56] *MCI Telecommunications Corp. v. American Telephone & Telegraph Co.*, 512 U.S. 218, 230-31 (1994); *Brown & Williamson Tobacco*, 529 U.S. at 126-27, 133; *Gonzales*, 546 U.S. at 267; *Utility Air Regulatory Group*, 573 U.S. at 322-25.

clearly delegated to the EPA its legislative power to determine whether generation shifting should be part of the best system of emission reduction — a "decision[] of vast economic and political significance."[57]

Such delegation might pass muster under a constitution amended by "moments" rather than the "reflection and choice" prescribed by Article V.[58] But if ever there was an era when an agency's good sense was alone enough to make its rules good law, that era is over.[59]

Congress decides what major rules make good sense. The Constitution's First Article begins, "All legislative Powers herein granted shall be vested in a Congress of the United States, which shall consist of a Senate and House of Representatives."[60] And every "law" must "pass[] the House of Representatives and the Senate" and "be presented to the President."[61] Thus, whatever multi-billion-dollar regulatory

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[57] *Utility Air Regulatory Group*, 573 U.S. at 324 (2014) (quoting *Brown & Williamson Tobacco*, 529 U.S. at 160) (cleaned up); *see also Gonzales*, 546 U.S. at 267 (quoting *Brown & Williamson Tobacco*, 529 U.S. at 160).

[58] *See* U.S. CONST. art. V; *compare* BRUCE ACKERMAN, *We the People: Foundations* 22 (1991) ("moments") *with* MICHAEL S. GREVE, *The Upside-Down Constitution* 13 (2012) ("reflection and choice") (quoting The FEDERALIST No. 1, at 3-7 (A. Hamilton) (J. Cooke ed., 1961)).

[59] *See, e.g.*, *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348, 1358-59 (2018) ("The Director may (today) think his approach makes for better policy, but policy considerations cannot create an ambiguity when the words on the page are clear. Neither may we defer to an agency official's preferences because we imagine some hypothetical reasonable legislator would have favored that approach. Our duty is to give effect to the text that *actual* legislators (plus one President) enacted into law.") (cleaned up).

[60] U.S. CONST. art. I, § 1.

[61] *Id.* § 7.

power the federal government might enjoy, it's found on the open floor of an accountable Congress, not in the impenetrable halls of an administrative agency — even if that agency is an overflowing font of good sense.[62]

Over time, the Supreme Court will further illuminate the nature of major questions and the limits of delegation. And under that caselaw, federal regulation will undoubtedly endure. So will federal regulators. Administrative agencies are constitutional, and they're here to stay.[63]

Beyond that, I leave it for others to predict what the Supreme Court's emerging jurisprudence may imply for those agencies' profiles. Here, regardless of deference and delegation doctrines, the regulation of coal-fired power plants under § 111 is invalid for a more mundane reason: A 1990 amendment to the Clean Air Act forbids it.

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[62] *See id.*; *id.* § 1; *A.L.A. Schechter Poultry Corp. v. United States*, 295 U.S. 495 (1935); *Marshall Field & Co. v. Clark*, 143 U.S. 649, 692 (1892); *Gundy v. United States*, 139 S. Ct. 2116, 2130-31 (2019) (Alito, J., concurring in the judgment); *see generally* MIKE LEE, *Our Lost Constitution* (2015); PHILIP HAMBURGER, *Is Administrative Law Unlawful?* (2014); Cody Ray Milner, Comment, *Into the Multiverse: Replacing the Intelligible Principle Standard With a Modern Multi-Theory of Nondelegation*, 28 GEO. MASON L. REV. 395 (2020); *cf. Talk America, Inc. v. Michigan Bell Telephone Co.*, 564 U.S. 50, 68 (2011) (Scalia, J., concurring) ("When the legislative and executive powers are united in the same person, or in the same body of magistrates, there can be no liberty . . . .") (quoting MONTESQUIEU, *Spirit of the Laws* bk. XI, ch. 6, pp. 151-52 (O. Piest ed., T. Nugent transl. 1949)); *In re Aiken County*, 725 F.3d 255, 264 (D.C. Cir. 2013) (same).

[63] *Gundy*, 139 S. Ct. at 2145 (Gorsuch, J., dissenting) ("Nor would enforcing the Constitution's demands spell doom for what some call the administrative state.") (cleaned up).

II.

The Clean Air Act Amendments of 1990 prohibit the EPA from subjecting power plants to regulation under § 111 if they are already regulated under § 112. The 2015 Rule and the 2019 Rule rely on § 111 for the authority to regulate coal-fired power plants. Because the EPA already regulates those coal-fired power plants under § 112, the rules are invalid.

A.

Before 1990, the Clean Air Act's § 112 told the EPA to create a list of hazardous air pollutants. Section 112 directed the EPA to regulate the pollutants on that list. And § 111 provided authorization to regulate pollutants *not* on that list.

Carbon is not on the § 112 list. So, under the pre-1990 scheme, the EPA could regulate carbon under § 111.

But Congress amended § 112 in 1990. Rather than just telling the EPA to make a § 112 list of pollutants, Congress created its own § 112 list.

That same year, Congress also amended § 111. As a result, the codified version of § 111 prohibits the regulation of pollutants "emitted from a *source category* which is regulated under [§ 112]."[64]

Coal-fired power plants are a source regulated under § 112.[65] Therefore, under the codified version of the Clean Air Act, coal plants cannot be regulated under § 111. And since the 2015 Rule and the 2019 Rule use § 111 to regulate carbon emitted from coal plants, those rules purport to do what the codified version of § 111 says the EPA cannot.

But that is not the whole story. Congress's Office of the Law Revision Counsel codifies statutes. And when it

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[64] 42 U.S.C. § 7411(d) (emphasis added).

[65] Their mercury emissions are regulated under § 112.

mistakenly codifies text different from the Statutes at Large, the Statutes at Large controls.[66] And the Statutes at Large differs from the codified text here.

The question concerns two amendments, one from each house of Congress, which both ended up in the final bill.[67]

Under the House Amendment:

> *The Administrator shall prescribe regulations . . . under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 7408(a) of this title or* ***emitted from a source category which is regulated under section 112*** *[of the Clean Air Act.]*[68]

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[66] *Cheney Railroad Co. v. Railroad Retirement Board*, 50 F.3d 1071, 1076 (D.C. Cir. 1995); *see also United States National Bank of Oregon v. Independent Insurance Agents of America, Inc.*, 508 U.S. 439, 448 & n.3 (1993).

[67] The section, before the 1990 Amendments, read:

> The Administrator shall prescribe regulations which shall establish a procedure . . . under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 7408(a) or *7412(b)(1)(A) of this title . . . .*

42 U.S.C. § 7411(d)(1) (1988) (emphasis added).

[68] Pub. L. No. 101-549, § 108(g), 104 Stat. 2399, 2467 (1990) (emphasis added); 42 U.S.C. § 7411(d)(1).

Under the Senate Amendment:

> *The Administrator shall prescribe regulations . . . under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 7408(a) of this title or* ***112(b)*** *[of the Clean Air Act.]*[69]

Let's compare those two versions with the most relevant text bolded, the divergent text underlined, and the other text struck through.

House Version:

> ***The Administrator shall prescribe regulations*** ~~*. . . under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source*~~ ***for any air pollutant*** ~~*(i) for which air quality criteria have not been issued or*~~ ***which is not*** ~~*included on a list published under section 7408(a) of this title or*~~ ***<u>emitted from a source category which is regulated under section 112</u>*** . . . .

Senate Version:

> ***The Administrator shall prescribe regulations*** ~~*. . . under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source*~~ ***for any air pollutant*** ~~*(i) for*~~

[69] Pub. L. No. 101-549, § 302(a), 104 Stat. 2399, 2574 (1990) (emphasis added).

> ~~*which air quality criteria have not been issued or*~~ ***which is not included on a list published under*** ~~*section 7408(a) of this title or*~~ ***112(b)*** . . . .

Finally, let's look at only the most relevant text.

House:

> ***The Administrator shall prescribe regulations for any air pollutant which is not emitted from a source category which is regulated under section 112.***

Senate:

> ***The Administrator shall prescribe regulations for any air pollutant which is not included on a list published under 112(b).***

To sum up so far, in my view:

- **The House** said the EPA can't use § 111 to regulate pollutants emitted from a source category regulated under § 112.[70]
    - **Coal-fired power plants** are a source category regulated under § 112.
- **The Senate** said the EPA can't use § 111 to regulate pollutants published under § 112.
    - **Carbon** is not a pollutant published under § 112.

Some parties argue the House and Senate Amendments conflict with each other or otherwise produce an absurd result. Others say they don't. In my view, it doesn't matter. If there's

[70] The EPA adopts a different interpretation of the House Amendment. That interpretation is addressed below in Part II.C.

a conflict, the House Amendment controls. And if there's no conflict, the Senate Amendment takes nothing away from the House Amendment. In *either* scenario — conflict or no conflict — regulation of coal-fired power plants under § 111 is invalid.

B.

Let's start with the first scenario: Assume the two amendments conflict.[71] If that creates an absurd result, "a mistake of expression (rather than of legislative wisdom) [may have] been made."[72] Such a mistake of expression — a "scrivener's error" — is typically viewed as a typo.[73] Where the reading "makes entire sense grammatically but produces a disposition that makes no substantive sense," a "drafter's error" may exist.[74] That said, the distinction between a scrivener's error and a drafter's error "is generally not a principled one."[75] Here, the Senate and House Amendments do not have obvious typos or mistakes, but some may think that including both in the statute "makes no substantive sense" — in the same way

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[71] *Cf.* 70 Fed. Reg. 15,994, 16,030-32 (Mar. 29, 2005) ("EPA is therefore confronted with the highly unusual situation of an enacted bill signed by the President that contains two different and inconsistent amendments to the same statutory provision.").

[72] Antonin Scalia, *Common-Law Courts in a Civil-Law System: The Role of United States Federal Courts in Interpreting the Constitution and Laws, in* A MATTER OF INTERPRETATION: FEDERAL COURTS AND THE LAW 3, 20 (Amy Gutmann ed., 1997); *see also West Virginia v. EPA*, No. 15-1363, Oral Arg. Tr. at 111 (Kavanaugh, J.) ("When [a conflict] happens[,] you [may] have a scrivener's error.").

[73] *See* ANTONIN SCALIA & BRYAN A. GARNER, *Reading Law: The Interpretation of Legal Texts* 234 (2012) (quoting Daniel A. Farber, *Statutory Interpretation and Legislative Supremacy*, 78 Geo. L.J. 281, 289 (1989)).

[74] *Id.* at 235.

[75] *Id.*

that a single order to "always drive fast" and "never drive fast" makes no substantive sense.

In these rare circumstances, judges may read the text in a way that accounts for these errors. In doing so, "we are not revising the apparent meaning of the text."[76] Instead, we give the text "the meaning that it would convey to a reasonable person, who would understand that misprints had occurred."[77] But the "meaning genuinely intended but inadequately expressed must be absolutely clear; otherwise we might be rewriting the statute rather than correcting a technical mistake."[78]

How then to discover the "meaning genuinely intended"?

Some might say "defer to the EPA" because of the text's ambiguity. But unintentional ambiguity from a drafter's error is nothing like the intentional ambiguity that typically receives *Chevron* deference. *Chevron* applies to deliberate gaps for an

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[76] *Id.*; *see also id.* at 234 (quoting *Grey v. Pearson*, [1857] 6 H.L. Cas. 61, 106 (per Lord Wensleydale)) (cleaned up).
[77] *Id.* at 235.
[78] *United States v. X-Citement Video, Inc.*, 513 U.S. 64, 82 (1994) (Scalia, J., dissenting).

agency to fill.[79] So deference is arguably faithful to a statute's meaning — at least in theory.[80]

In contrast, drafter's errors are accidents. So there's no reason to believe deference was "genuinely intended." And to the extent an office or agency with expertise is entitled to deference here — none is[81] — Congress's Office of the Law Revision Counsel is the leading candidate. Its whole job is to produce the United States Code, and it dismissed the Senate Amendment as a drafter's error.

Others might say the default should be freedom from regulation when a drafter's error creates ambiguity over an agency's authority to promulgate a major rule. After all, if Congress doesn't clearly endorse a major regulation, there can be no major regulation.[82]

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[79] *Chevron, U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 862 (1984); *cf. Pereira v. Sessions*, 138 S. Ct. 2105, 2121 (2018) (Kennedy, J., concurring) ("Given the concerns raised by some Members of this Court it seems necessary and appropriate to reconsider, in an appropriate case, the premises that underlie *Chevron* and how courts have implemented that decision. The proper rules for interpreting statutes and determining agency jurisdiction and substantive agency powers should accord with constitutional separation-of-powers principles and the function and province of the Judiciary.") (cleaned up).

[80] *But see Gutierrez-Brizuela v. Lynch*, 834 F.3d 1142, 1153 (10th Cir. 2016) (Gorsuch, J., concurring) ("The fact is, *Chevron*'s claim about legislative intentions is no more than a fiction — and one that requires a pretty hefty suspension of disbelief at that.").

[81] *Ganem v. Heckler*, 746 F.2d 844, 851 (D.C. Cir. 1984) ("[T]he changes made by the codifiers, whose choice, made without the approval of Congress[,] should be given no weight, are of no substantive moment.") (cleaned up).

[82] *See MCI Telecommunications*, 512 U.S. at 230-31; *Brown & Williamson Tobacco*, 529 U.S. at 126-27, 133; *Gonzales*, 546 U.S. at 267; *Utility Air Regulatory Group*, 573 U.S. at 322-25.

But as with *Chevron*, the major-rules doctrine draws *meaning* from ambiguity: Because Congress does not hide elephants in mouseholes, we presume the absence of clarity means Congress intentionally chose not to endorse a major regulation. So as with *Chevron*'s premise, the premise of the major-rules doctrine is inapplicable to a drafter's error. Here, to the extent an elephant's in a mousehole, we don't know whether the misprint is the mousehole or the elephant.

That leaves us with a third option: inquiring into legislative history. True, as a general matter, courts should reject any significant reliance on legislative history. Hamilton did.[83] So did Marshall.[84] And Madison.[85] And Story.[86] "From the beginnings of the republic, American law followed what is known as the 'no-recourse doctrine' — that in the interpretation of a text, no recourse may be had to legislative history."[87] And although many judges abandoned the no-recourse doctrine by the second half of the twentieth century,[88] leading textualists like Justice Scalia have made important progress in reviving it.

But "[w]hen you have a scrivener's error[,] everyone, including Justice Scalia, would look at the legislative history."[89] Indeed, he "believed that the *only* time it was

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[83] ANTONIN SCALIA & BRYAN A. GARNER, *Reading Law: The Interpretation of Legal Texts* 370 (2012).
[84] *Id.* at 370-71.
[85] *Id.* at 371.
[86] *Id.* at 371-72.
[87] *Id.* at 369.
[88] *Id.* at 388.
[89] *West Virginia v. EPA*, No. 15-1363, Oral Arg. Tr. at 111 (Kavanaugh, J.); *see also* John Copeland Nagle, *CERCLA's Mistakes*, 38 WM. & MARY L. REV. 1405, 1414 (1997) ("[E]ven textualists like Justice Scalia acknowledge that the courts can remedy a 'scrivener's error' notwithstanding plain statutory language.").

appropriate for a court to use legislative history was when there was a credible claim of scrivener's error."[90] For example, concurring in the judgment in *Green v. Bock Laundry Machine Co.*, Justice Scalia considered "it entirely appropriate to consult . . . legislative history . . . to verify that what seems . . . an unthinkable disposition . . . was indeed unthought of, and thus to justify a departure from the ordinary meaning of the word" at issue.[91]

So, to recap: (1) The House and Senate Amendments may conflict; (2) if they do, there may have been a drafter's error; and (3) legislative history can illuminate a drafter's error.

What then, if anything, does the legislative history tell us? (Buckle up.)

In 1990, the House passed a bill with many amendments to the Clean Air Act. The Senate passed a different bill. A Conference Committee reconciled them. But it made (at least) *two* drafter's errors — assuming again our two amendments conflict.

First, the Conference Committee put both the House and Senate Amendments in the Conference Report, which became the final bill.[92]

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[90] Megan McDermott, *Justice Scalia's Bankruptcy Jurisprudence: The Right Judicial Philosophy for the Modern Bankruptcy Code?*, 2017 UTAH L. REV. 939, 974 (2017) (emphasis added).

[91] 490 U.S. 504, 527 (1989) (Scalia, J., concurring in the judgment).

[92] The Conference Report says "[t]hat the Senate recede[s] from its disagreement to the amendment of the House to the text of the bill and agree[s] to the same with an amendment as follows: In lieu of the matter proposed to be inserted by the House amendment insert the following: . . . Sec. 108. Miscellaneous provisions." H.R. Rep. No. 101-952, 101st Cong., at 1 (1990) (cleaned up). Section 108(g) under "Miscellaneous provisions" was the House Amendment that

Second, the Conference Committee botched the "Joint Explanatory Statement of the Committee of Conference."[93]

The Joint Statement said, "The House amendment to the text of the bill struck out all of the Senate bill after the enacting clause and inserted a substitute text."[94] That "amendment" refers to the House's entire set of amendments to the Clean Air Act. Clear enough so far.

The Joint Statement then said, "The Senate recedes from its disagreement to the amendment of the House . . . ."[95] Again, that seems straightforward.

But the Joint Statement didn't stop there. The full sentence excerpted just above says:

> *The Senate recedes from its disagreement to the amendment of the House with an amendment which is a substitute for the Senate bill and the House amendment.*[96]

That is drivel. The Senate recedes with an amendment? What amendment? And how is that receding? And did the House recede to the Senate's amendment to the House's amendment that the Senate receded to?

The next day, the bill's Senate Managers issued a statement attempting to clarify the previous day's materials.

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struck "or 112(b)(1)(A)" and inserted "or emitted from a source category which is regulated under section 112." *Id.* at 73. But later in the report we find the Senate's original proposed amendment — replacing "112(b)(1)(A)" with "112(b)." *Id.* at 183. So the Senate says it receded to the House, and yet we still see the Senate's original language in the document.

[93] *Id.* at 335-55.

[94] *Id.* at 335.

[95] *Id.*

[96] *Id.*

The statement notes that for two unrelated portions of the § 111 amendments, the House receded to the Senate.[97] But it said the Senate receded to the House regarding all other § 111 changes, including the change at issue in this case.[98]

To the extent a statement by Senate Managers can ever clear up a question of statutory meaning — count me skeptical[99] — theirs did.

Here's where that leaves me. I'm frankly *not* convinced the House and Senate Amendments are the product of a drafter's error. But *if* they are, the most lucid piece of legislative history says the Senate intended to recede to the House.

That would leave the House Amendment as the last man standing. And under the House Amendment, the EPA can't regulate air pollutants from coal-fired power plants under § 111 when the plants are already regulated under § 112. Therefore, if the House and Senate Amendments conflict, the 2015 Rule and the 2019 Rule are invalid.[100]

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[97] *Chafee-Baucus Statement of Senate Managers, S. 1630, the Clean Air Act Amendments of 1990*, 136 Cong. Rec. 36007, 36067 (Oct. 27, 1990).

[98] *Id.* The full sentence about the two amendments at issue here reads: "*Conference agreement*. The Senate recedes to the House except that with respect to the requirement regarding judicial review of reports, the House recedes to the Senate and with respect to transportation planning, the House recedes to the Senate with certain modifications." In other words, except for judicial review of reports (immaterial here) and transportation planning (immaterial here), the Senate receded to the House.

[99] *Environmental Defense Fund, Inc. v. EPA*, 82 F.3d 451, 460 n.11 (D.C. Cir. 1996).

[100] The EPA doesn't like that result. For thirty years it has either ignored or misconstrued the House Amendment. But the EPA's

C.

As for the second (and more likely) of the two scenarios: Assume the House and Senate Amendments do *not* conflict. In that case, we don't strike the Senate Amendment as a drafter's error.[101] But even then, the House Amendment retains its full effect.

Recall that each amendment does two things. First, it creates a category of air pollutants. And second, it excludes that category from regulations authorized under § 111.

For the House Amendment, that category covers any pollutant "emitted from a source category which is regulated under section 112." And for the Senate Amendment, that category covers any pollutant "published under section . . . 112(b)."

So to see what's in the House Amendment's category, you'd start by making a list of every source regulated under § 112. As far as § 111 regulation goes, any air pollutants from those sources — including coal-fired power plants — are forbidden fruit under the House Amendment.

To create the Senate Amendment's list, you'd simply pull the 180 or so pollutants from § 112(b), as modified by the EPA since 1990. As far as § 111 regulation goes, those pollutants

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long-running error is no reason to ignore plain text. To the extent I glean anything from the EPA's thirty-year mistake, it's that the EPA might be entitled to less deference than it thinks it deserves.

[101] For the reader's convenience, here again is the codified version of § 111(d): "The Administrator shall prescribe regulations which shall establish a procedure . . . under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source for **any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under [§ 108(a)] or emitted from a source category which is regulated under [§ 112]** . . . ." (emphasis added).

— mercury compounds, asbestos, and more than 180 others — are forbidden fruit under the Senate Amendment.[102]

In general, the House Amendment sweeps more broadly than the Senate Amendment. For example, the House Amendment's list includes pollution from coal-fired power plants, since they are regulated for mercury. So under the House Amendment, § 111 cannot be used to regulate coal-fired power plants at all.

In contrast, the Senate Amendment's list includes mercury, but it does not include *all* other pollution from sources that emit mercury. So under the Senate Amendment, § 111 cannot be used to regulate coal-fired power plants' emissions of mercury. But the Senate Amendment does not by itself stop the EPA from using § 111 to regulate coal-fired power plants' emissions of pollutants like carbon, since carbon isn't on the Senate Amendment's list.

That the House Amendment generally sweeps more broadly than the Senate Amendment, however, does not mean that fidelity to the House Amendment fails to give full effect to the Senate Amendment. For example, imagine two parents choosing a name for their child. The father says, "There's no way we're naming our baby after a president from Virginia." And the mother says, "There's no way we're naming our baby after *any* president."

Just like the House and the Senate each took certain regulations off § 111's table, the mother and father have each taken certain names off the table. And just as the House Amendment excludes from § 111 every regulation excluded by

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[102] *Initial List of Hazardous Air Pollutants with Modifications*, EPA, https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications.

the Senate Amendment (and then some), the mother has said no way to every name excluded by the father (and then some).

When you give full effect to the mother's no-way list, you are not ignoring the father's no-way list — because the father's list only *excludes* names and thus does not require the *inclusion* of any names. And for the same reason, when you give full effect to the father's list, you are not ignoring the mother's — because the mother's no-way list does not require the inclusion of names excluded by the father.

Like the father's list, the Senate Amendment has a lot to say about what's *excluded* from § 111. But like the father's list, the Senate Amendment says nothing about what's *included*. So when the House Amendment excludes coal-fired power plants from § 111's scope, it doesn't ignore the Senate Amendment. It supplements it — by excluding from § 111's scope a category of regulations not already excluded by the Senate Amendment.

That's the situation that will occur most often — air pollutants excluded from § 111 regulation because they're on the Senate Amendment's list will also be excluded from § 111 regulation because they're on the House Amendment's list.

But there may exist situations, at least in theory, when only the Senate Amendment does any work.

For example, consider a hazardous air pollutant listed under § 112 but "emitted by sources that Section [112] does not reach."[103] That pollutant is barred from § 111 regulation by the Senate Amendment (because it's a *pollutant* listed under § 112), but it is arguably not barred by the House Amendment (because it's emitted from a *source* not regulated under § 112).

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[103] Majority Op. at 119-20 n.19.

In that scenario, it's possible only the Senate Amendment would bar § 111 regulation.[104]

In other words, these § 111 exclusions might form a Venn diagram: Some air pollutants are excluded from § 111 regulation only because of the House Amendment (like carbon from coal-fired power plants), some pollutants are only excluded because of the Senate Amendment (as in the hypothetical I just described), and some pollutants are excluded because of both amendments (like mercury from coal-fired power plants). Recognizing *both* amendments as operative gives "maximum possible effect" to each.[105]

The EPA says *Chevron* applies to this question. Even so, the outcome is the same. At *Chevron* step one, the plain text of the Senate Amendment takes nothing away from the plain text of the House Amendment and vice versa. And because the House Amendment expressly precludes the regulation of coal-fired power plants under § 111, the plain text precludes the 2015 Rule and the 2019 Rule — both of which depended on § 111 to regulate coal-fired power plants.

In *American Electric Power Co. v. Connecticut*, the Supreme Court agreed with this reading. It said the "EPA may not employ § [111(d)] if existing stationary sources of the pollutant in question are regulated under the national ambient

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[104] As another theoretical example, consider a source that emits a pollutant on § 112's list and assume the EPA is *required* to regulate that source based on § 112's parameters. But now imagine that, notwithstanding that requirement, the EPA has not *yet* regulated the source. After all, sometimes these things take time. In that situation too, the Senate Amendment might exclude from § 111 regulation pollutants that the House Amendment might not (yet).

[105] *Citizens to Save Spencer County v. EPA*, 600 F.2d 844, 870 (D.C. Cir. 1979).

air quality standard program . . . or the 'hazardous air pollutants' program, § [112]."[106]

The EPA adopts a different approach to the House Amendment. In "any air pollutant . . . emitted from a source category which is regulated under section 112," the EPA reads the phrase "which is regulated under section 112" to modify "air pollutant," rather than "source category." So it would exclude from § 111's scope only an "air pollutant . . . which is regulated under § 112":

[106] *American Electric Power Co. v. Connecticut*, 564 U.S. 410, 424 n.7 (2011) (citing § 7411(d)(1)). The EPA notes that this footnote was dicta and that it conflicted with national ambient air quality standard regulations at the time. But the EPA can't have it both ways: It can't dismiss an inconvenient part of *American Electric Power* that is directly on point and then *rely* on other parts of that case where the precise meaning and contours of § 111(d) were not at issue.

As for *American Electric Power*'s holding, it depended on the Supreme Court's understanding that § 111(d) "speaks directly" to carbon emissions from fossil-fuel plants. *Id.* at 424. I agree that § 111(d) "speaks directly" to whether the EPA can or cannot regulate carbon from coal-fired power plants: The provision directly says that the EPA can regulate pollutants from existing sources *unless* the EPA already regulates those sources under § 112. *Compare id. with id.* at 424 n.7.

> ***The Administrator shall prescribe regulations*** ~~*. . . under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source*~~ ***for any air pollutant*** ~~*(i) for which air quality criteria have not been issued or which is not included on a list published under section 108(a) or emitted from a source category*~~ ***which is regulated under section 112*** . . . .

To get to the EPA's preferred reading — to make "which is regulated by section 112" modify "air pollutant" — the EPA needs to read into § 111(d)(1)(A)(i) a triplet of three whiches:[107]

> *The Administrator shall prescribe regulations . . . under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source for* <u>*any air pollutant*</u> *[1]* ***for which*** *air quality criteria have not been issued* ***or*** *[2]* ***which*** *is not included on a list published under § 108(a) or emitted from a source category [3]* ***which*** *is [not] regulated under § 112 . . . .*

My alterations — including [1], [2], [3], and [not] — reflect the tripartite division implied by the EPA. But of course the alterations were not in the original. If they were, the EPA's grammatically unconventional reading might work. They're not, so it doesn't.

For four reasons, the EPA's approach is not persuasive.

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[107] *Cf.* WILLIAM SHAKESPEARE, MACBETH act 1, sc. 1.

First, "ordinarily, and within reason, modifiers and qualifying phrases attach to the terms that are nearest."[108] Under that canon, a modifying phrase, such as "which is regulated under section 112," should apply to the closest noun possible — "source category," not "air pollutant."

Second, the EPA all but reads out of § 111 the following words: "emitted from a source category." To be sure, Congress will sometimes "include words that add nothing of substance," so the canon against surplusage has limits.[109] That's why "a court may well prefer ordinary meaning to an unusual meaning that will avoid surplusage."[110] But amputating the words "emitted from a source category" does not clarify § 111's "ordinary meaning." Instead, doing so transforms that meaning.

Third, and most importantly, Congress put a conjunction (**"or"**) between parts one and two of the imagined triplet, but not between parts two and three. If the EPA's triplet exists, Congress's approach to English was, to put it kindly, novel.

In formal English, you usually separate a triplet with a conjunction between the second and third parts. (Life, liberty, **or** property.) Informal English sometimes puts a conjunction between the first and second, *and* between the second and third. (Life **or** liberty **or** property.) Sometimes you see a triplet with no conjunction. (Life, liberty, property.) But you rarely if ever see a triplet's conjunction separate the first and second parts

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[108] *Grecian Magnesite Mining, Industrial & Shipping Co., SA v. Commissioner*, 926 F.3d 819, 824 (D.C. Cir. 2019); *see also Lockhart v. United States*, 136 S. Ct. 958, 962 (2016); ANTONIN SCALIA & BRYAN A. GARNER, *Reading Law: The Interpretation of Legal Texts* 144-46 (2012).

[109] ANTONIN SCALIA & BRYAN A. GARNER, *Reading Law: The Interpretation of Legal Texts* 176 (2012).

[110] *Id.*

without also separating the second and third parts. (Life **or** liberty property). That's why it's not:

- Stop and drop roll; or
- Red and white blue; or
- Reduce and reuse recycle; or
- Blood and sweat tears; or
- Huey and Dewey Louie.

Thus, the EPA would require us to read into § 111 a triplet written in a way no one writes.[111]

Fourth and finally, the EPA says a plain-text reading of the House Amendment would leave § 111 almost no work to do.

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[111] Whatever else the savings clause in § 112(d)(7) might save, it can't save *that*. *Cf.* 42 U.S.C. § 7412(d)(7) ("No emission standard or other requirement promulgated under this section shall be interpreted, construed or applied to diminish or replace the requirements of a more stringent emission limitation or other applicable requirement established pursuant to section 7411 of this title, part C or D, or other authority of this chapter or a standard issued under State authority.").

Note that § 112(d)(7) applies only to requirements "established pursuant to" § 111. And even the EPA says regulations cannot be established pursuant to § 111 if they target pollutants already regulated under § 112. *See also American Electric Power*, 564 U.S. at 424 n.7. So everyone agrees the § 111 amendments exclude *something* from § 111 based on § 112. And § 112(d)(7) does not cover whatever is excluded.

What's more, § 111(d)'s exclusion is more specific than § 112(d)(7)'s generalities, and the specific usually controls the general. *See* ANTONIN SCALIA & BRYAN A. GARNER, *Reading Law: The Interpretation of Legal Texts* 183 (2012).

But if so, that was a choice for Congress. After all, the 1990 Clean Air Act Amendments added more than one hundred pollutants to § 112's scope, with a mechanism for the EPA to add even more later.[112] Maybe Congress thought § 111(d) shouldn't be much more than a rarely used gap-filler in light of a beefed up § 112 — at least until Congress passed another law saying otherwise.

Of course, in the end, it doesn't matter what Congress was *thinking*.[113] "It is the *law* that governs, not the intent of the lawgiver."[114] That's because, among other reasons, "it is simply incompatible with democratic government, or indeed, even with fair government, to have the meaning of a law determined by what the lawgiver meant, rather than by what the lawgiver promulgated."[115]

Thus, an oddity of timing doesn't trigger *Chevron* deference.[116] Nor does ambiguity arise every time an agency wishes a statutory provision did more work than it does. When statutory text informed by structure and context is clear, "that is the end of the matter."[117]

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[112] Pub. L. No. 101-549, § 301, 104 Stat. 2399, 2532-37 (1990).

[113] *Cf. Gutierrez-Brizuela*, 834 F.3d at 1153 (Gorsuch, J., concurring) ("Trying to infer the intentions of an institution composed of 535 members is a notoriously doubtful business under the best of circumstances.").

[114] Antonin Scalia, *Common-Law Courts in a Civil-Law System: The Role of United States Federal Courts in Interpreting the Constitution and Laws, in* A MATTER OF INTERPRETATION: FEDERAL COURTS AND THE LAW 3, 17 (Amy Gutmann ed., 1997).

[115] *Id.*

[116] *Cf.* Public Health & Environmental Respondent-Intervenors' Br. at 10-11.

[117] *Chevron*, 467 U.S. at 842.

* * *

This case touches on some of administrative law's most consequential, unresolved issues. What is the reach of *Massachusetts v. EPA*? What is the meaning of a major question? What are the limits of congressional delegation?

Each of those issues — and a dozen or two more — might have mattered if the EPA had relied on a section of the Clean Air Act other than § 111 to promulgate both rules at issue in this case. But a 1990 amendment to § 111 excluded a category of regulations from § 111's scope. And because that category covers the regulations challenged today, those other legal questions are academic.

Both houses of Congress voted that amendment — the House Amendment — into law. And as explained above, if it conflicts with the Senate-proposed amendment to § 111, the Senate Amendment was a drafter's error.

On the other hand, if the House and Senate Amendments can coexist, the House Amendment simply excludes from § 111's scope a category of regulations in addition to the regulations excluded by the Senate Amendment.

Either way, the law precludes what the House Amendment precludes. And the House Amendment precludes § 111 regulations of coal-fired power plants already covered by § 112.

Therefore, the EPA correctly repealed the 2015 Rule, but its replacement rule improperly applied § 111 to coal-fired power plants already regulated under § 112.

Those conclusions lead to this respectful concurrence in part, concurrence in the judgment in part, and dissent in part.[118]

[118] The majority's thoughtful opinion (I) describes this case's regulatory and procedural history; (II) vacates the 2019 Rule; (III.A) rejects most of the Coal Petitioners' arguments, including their contention that the EPA cannot use § 111 to regulate carbon emissions from power plants already regulated under § 112; (III.B) dismisses the Robinson Petitioners' challenge for lack of standing; (IV) vacates the EPA's implementing regulations for emission guidelines promulgated under § 111(d); (V) describes the remedy; and (VI) concludes. I concur in part of the judgment with respect to Part II, concur with respect to Part III.B, and concur in the judgment with respect to Part IV.

Message

From: Goffman, Joseph [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23474D598E8D4EDFA9214A5991F2935B-GOFFMAN, JO]
Sent: 11/23/2021 1:26:59 PM
To: Campbell, Ann [Campbell.Ann@epa.gov]; Rakosnik, Delaney [rakosnik.delaney@epa.gov]
CC: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
Subject: FW: APPA Meeting Request
Attachments: APPA Letter to Joe Goffman 11.22.2021.pdf

Usual drill. I'm inclined to take this meeting since we are thinking that we will be entering the outreach phase of our power plant work in January, but please do check with OAQPS. Thanks.

Joseph Goffman
Principal Deputy Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

From: Carolyn Slaughter <cslaughter@publicpower.org>
Sent: Monday, November 22, 2021 10:04 AM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>
Subject: APPA Meeting Request

Dear Mr. Goffman:
The American Public Power Association (APPA) and its member utilities support the leadership and coordination that your dedicated staff has shown to public power. We would appreciate the opportunity to meet with you in December or January 2021 to discuss our ongoing partnership and public power's environmental and climate-related priorities.

I look forward to hearing from you at your earliest convenience regarding this meeting request.

Best regards,
Carolyn Slaughter
Director, Environmental Policy
American Public Power Association
Email: cslaughter@publicpower.org
Direct: 202-467-2943
Mobile: 202-957-8997

Appointment

From: Goffman, Joseph [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23474D598E8D4EDFA9214A5991F2935B-GOFFMAN, JO]
Sent: 11/23/2021 8:34:33 PM
To: Johnson, Antoinette [Johnson.Antoinette@epa.gov]

Subject: Accepted: CPAD Check-in Meeting for Mercury Salts
Location: Microsoft Teams Meeting

Start: 12/21/2021 9:00:00 PM
End: 12/21/2021 9:30:00 PM

Recurrence: (none)

Message

From: Goffman, Joseph [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23474D598E8D4EDFA9214A5991F2935B-GOFFMAN, JO]
Sent: 11/30/2021 3:59:20 AM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
Subject: Re: AGs call

Looks good. Thanks, Tomas.

Sent from my iPhone

On Nov 29, 2021, at 10:48 PM, Carbonell, Tomas <Carbonell.Tomas@epa.gov> wrote:

Hi Joe, based on our discussion last week, here's a rough agenda for the call with the AGs tomorrow:

Ex. 5 Deliberative Process (DP)

Best,

Tomás

Message

From: Goffman, Joseph [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23474D598E8D4EDFA9214A5991F2935B-GOFFMAN, JO]
Sent: 12/1/2021 11:12:08 PM
To: Kim, Eunjung [Kim.Eun@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]
Subject: RE: REVIEW - Administrator Materials for Power Plant Strategy Outreach
Attachments: 2021 12 07 OAR Outreach on Climate Rules for the Power Sector - Briefing Memo jg.docx; 2021 12 07 OAR Outreach on Climate Rules for the Power Sector - Slides jg.pptx

With a couple of tweaks. Please check font on slide 3, where I added a new third bullet. Thanks.

Joseph Goffman
Principal Deputy Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

From: Kim, Eunjung <Kim.Eun@epa.gov>
Sent: Wednesday, December 1, 2021 4:02 PM
To: Carbonell, Tomas <Carbonell.Tomas@epa.gov>; Goffman, Joseph <Goffman.Joseph@epa.gov>
Cc: Campbell, Ann <Campbell.Ann@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Subject: REVIEW - Administrator Materials for Power Plant Strategy Outreach

Hey Joe and Tomas,
Attached are the materials for the upcoming Administrator briefing on the power plant strategy outreach. OAQPS wanted me to relay to you that there is one additional update to the slides. On slide 8, they replaced the timeline table with a simplified bulleted list. They think it will be easier to present this way and more conducive to good discussion with the Administrator.

Please review by 9am tomorrow.

Thanks!

Eunjung Kim
Special Assistant
Office of Air and Radiation
Environmental Protection Agency
(202) 815-7252

Message

From: Goffman, Joseph [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23474D598E8D4EDFA9214A5991F2935B-GOFFMAN, JO]
Sent: 12/16/2021 1:28:15 PM
To: Campbell, Ann [Campbell.Ann@epa.gov]
CC: Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]
Subject: RE: FOR YOUR SIGNATURE: NPRM Primary Copper SAN 7522
Attachments: Primary Copper NPRM Action Memo Signed.doc

Joseph Goffman
Principal Deputy Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Thursday, December 16, 2021 7:17 AM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>
Cc: Carbonell, Tomas <Carbonell.Tomas@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR YOUR SIGNATURE: NPRM Primary Copper SAN 7522
Importance: High

Joe, the attached is ready for your review and signature on the action memo. Tomas has reviewed and concurred (attached). The Final for this action is court ordered for April 1, 2022.

Thank you,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Morgan, Ruthw <morgan.ruthw@epa.gov>
Sent: Tuesday, December 14, 2021 8:13 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Cc: OAQPSREGPROCESSING <OAQPSREGPROCESSING@epa.gov>; Lubetsky, Jonathan <Lubetsky.Jonathan@epa.gov>; Mcquilkin, Wendy <Mcquilkin.Wendy@epa.gov>; Olson, Heather <Olson.Heather@epa.gov>; Morgan, Ruthw <morgan.ruthw@epa.gov>; Iglesias, Amber <Iglesias.Amber@epa.gov>; Culligan, Kevin <Culligan.Kevin@epa.gov>; Chang, Alice <Chang.Alice@epa.gov>
Subject: For Signature: NPRM Primary Copper SAN 7522
Importance: High

To: Immediate Office for review on signature package.

Attached is the signature package for the proposed National Emission Standards for Hazardous Air Pollutants: Primary Copper Smelting Residual Risk and Technology Review and Primary Copper Smelting Area Source Technology Review (SAN 7522). I will have a CMS number shortly and will send when available. This package has a consent decree of 4/1/2022 for the final action.

POC: Amber Iglesias
202-564-3175

Thanks!

Ruthw Morgan – 202 564-1326

Message

From: Goffman, Joseph [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23474D598E8D4EDFA9214A5991F2935B-GOFFMAN, JO]
Sent: 11/23/2021 12:32:00 AM
To: Peter Tsirigotis (Tsirigotis.Peter@epa.gov) [Tsirigotis.Peter@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Koerber, Mike [Koerber.Mike@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]
Subject: FW: Draft for OAR - Draft Proposal: FIP Addressing Regional Ozone Transport for 2015 NAAQS
Attachments: DRAFT Preamble_FIP Adressing Regional Ozone Transport for 2015 Ozone NAAQS_v3.docx

Importance: High

Let me start by apologizing if I already committed to this, but is "**review by 11/26/2021"** a prank? My recollection such as it is is that we would at least get the entire weekend, not 2 already heavily scheduled business days and a family holiday. Please advise. Thanks.

Joseph Goffman
Principal Deputy Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

From: Lin, Walter <lin.walter@epa.gov>
Sent: Monday, November 22, 2021 1:13 PM
To: Hooper, Daniel <hooper.daniel@epa.gov>
Cc: Campbell, Ann <Campbell.Ann@epa.gov>; Koerber, Mike <Koerber.Mike@epa.gov>
Subject: FW: Draft for OAR - Draft Proposal: FIP Addressing Regional Ozone Transport for 2015 NAAQS

Hey Dan,

Please add the attached document into Joe's reading folder for **review by 11/26/2021** in advance of FAR.

Thanks,
Walter

From: Long, Pam <Long.Pam@epa.gov>
Sent: Monday, November 22, 2021 9:40 AM
To: Koerber, Mike <Koerber.Mike@epa.gov>; Lin, Walter <lin.walter@epa.gov>
Cc: Selbst, Elizabeth <selbst.elizabeth@epa.gov>; Mathias, Scott <Mathias.Scott@epa.gov>; Johnson, Yvonne W <Johnson.Yvonnew@epa.gov>; Palma, Elizabeth <Palma.Elizabeth@epa.gov>
Subject: Draft for OAR - Draft Proposal: FIP Addressing Regional Ozone Transport for 2015 NAAQS

Attached is the draft preamble for the 2015 Ozone Transport FIP to forward to **OAR for review by 11/26/2021** in advance of FAR. The attached document incorporates comments from cross-office division directors (OAQPS, OAP, OGC, Regional Offices) and office directors (OAQPS, OAP). The document also includes some placeholder language primarily referencing underlying support documents that the team continues to develop. Let us know if you have any questions. Thanks.

Message

From: Goffman, Joseph [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23474D598E8D4EDFA9214A5991F2935B-GOFFMAN, JO]
Sent: 12/8/2021 2:35:03 AM
To: Koerber, Mike [Koerber.Mike@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Peter Tsirigotis (Tsirigotis.Peter@epa.gov) [Tsirigotis.Peter@epa.gov]
CC: Kim, Eunjung [Kim.Eun@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]
Subject: FW: Administrator Visit Briefing Memo, Slide Deck, and Attendee list
Attachments: Total_Air_Exposure_Ax briefing_120221.pptx; Attendee List for the Administrators visit to RTP 12102021.docx; Briefing memo Risk from Total Air Toxics Identifcation and Solutions.docx

The last two slides deliver a lot of good thinking on concrete actions that can be taken in the near term. Do you think we could add a slide to 2 or 3 slides at the beginning that previews in short form what is on the last two slides so that we can give him a flavor right away of the fact that we're focused on meaningful near-term concrete actions? Thanks.

Joseph Goffman
Principal Deputy Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

From: Lin, Walter <lin.walter@epa.gov>
Sent: Tuesday, December 7, 2021 6:01 PM
To: Hooper, Daniel <hooper.daniel@epa.gov>
Cc: Koerber, Mike <Koerber.Mike@epa.gov>; Kim, Eunjung <Kim.Eun@epa.gov>
Subject: Administrator Visit Briefing Memo, Slide Deck, and Attendee list

Hey Dan,

Please see attached briefing memo, slide deck and attendee list for the Administrator's visit to RTP.

Thanks,
Walter

Message

From: Goffman, Joseph [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23474D598E8D4EDFA9214A5991F2935B-GOFFMAN, JO]
Sent: 1/10/2022 1:08:06 PM
To: Campbell, Ann [Campbell.Ann@epa.gov]
CC: Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]
Subject: RE: FOR YOUR CONCURRENCE: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

I concur in sending this forward to initiate OMB review. Thanks.

Joseph Goffman
Principal Deputy Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, January 4, 2022 4:23 PM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>
Cc: Carbonell, Tomas <Carbonell.Tomas@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR YOUR CONCURRENCE: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Joe, the attached (clean and RLSO versions) is ready for your review and concurrence to send to OP to initiate OMB review. Tomás has reviewed and concurred (below). This action is court ordered for May 2.

Thank you,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Sent: Tuesday, January 4, 2022 3:53 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: RE: FOR YOUR CONCURRENCE: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Great, thanks. I concur in sending this forward to Joe. Best,

Tomás

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, January 4, 2022 3:37 PM
To: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR YOUR CONCURRENCE: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Tomas, the program concurs with your latest edit(s). Shall I move this forward to Joe?

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Chang, Alice <Chang.Alice@epa.gov>
Sent: Tuesday, January 4, 2022 3:02 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Mcquilkin, Wendy <Mcquilkin.Wendy@epa.gov>; Iglesias, Amber <Iglesias.Amber@epa.gov>
Subject: FW: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Good to go with these, Ann. Please see attached!

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, January 4, 2022 12:25 PM
To: Chang, Alice <Chang.Alice@epa.gov>
Cc: Iglesias, Amber <Iglesias.Amber@epa.gov>
Subject: FW: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Alice, one last change in the attached. Please let me know if the program concurs and we'll move this forward to Joe. Thank you.

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Sent: Tuesday, January 4, 2022 12:22 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: RE: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Thanks Ann, I really appreciate the team's patience in iterating on this. The latest changes look good. In reviewing the summary of our rationale for the final action, Ex. 5 Deliberative Process (DP) Ex. 5 Deliberative Process (DP) Ex. 5 Deliberative Process (DP) h. Hopefully this will be last round! Best,

Tomás

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, January 4, 2022 7:59 AM
To: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Tomas, the program has responded to your last round of edits in the attached. Please let me know if you concur.

Thank you.

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Chang, Alice <Chang.Alice@epa.gov>
Sent: Tuesday, January 4, 2022 7:52 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>; Culligan, Kevin <Culligan.Kevin@epa.gov>; Iglesias, Amber <Iglesias.Amber@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: RE: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Ann – please see revised document. Thanks!

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, December 21, 2021 4:14 PM
To: Culligan, Kevin <Culligan.Kevin@epa.gov>; Chang, Alice <Chang.Alice@epa.gov>; Iglesias, Amber <Iglesias.Amber@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: Fwd: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Few more edits from Tomas. Please let me know if you all are comfortable with these and we'll move it along to Joe. Thanks.

Ann (Campbell) Ferrio
Chief of Staff
Office of Air and Radiation
(202) 566-1370

Begin forwarded message:

From: "Carbonell, Tomas" <Carbonell.Tomas@epa.gov>
Date: December 21, 2021 at 3:57:01 PM EST
To: "Campbell, Ann" <Campbell.Ann@epa.gov>
Cc: "Hooper, Daniel" <hooper.daniel@epa.gov>
Subject: RE: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Thanks so much Ann. Have suggested a few more edits to the discussion of Minamata in the attached – assuming the program is good to go with these, I concur with sending this forward to Joe. Best,

Tomás

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, December 21, 2021 11:02 AM
To: Carbonell, Tomas <Carbonell.Tomas@epa.gov>

Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Tomas, the attached has been revised pursuant to your comments and is ready for your re-review and concurrence to initiate OMB review.

Thank you,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Chang, Alice <Chang.Alice@epa.gov>
Sent: Tuesday, December 21, 2021 10:28 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Olson, Heather <Olson.Heather@epa.gov>; Iglesias, Amber <Iglesias.Amber@epa.gov>; Culligan, Kevin <Culligan.Kevin@epa.gov>
Subject: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Ann – please see revised document with Tomas' comments addressed. RLSO and clean versions attached.

Let me know if you have any questions.

From: French, Chuck <French.Chuck@epa.gov>
Sent: Tuesday, December 21, 2021 10:02 AM
To: Joseph, Wanda <joseph.wanda@epa.gov>; Mulrine, Phil <Mulrine.Phil@epa.gov>
Cc: Gates, Adrian <gates.adrian@epa.gov>; Cozzie, David <Cozzie.David@epa.gov>; South, Peter <South.Peter@epa.gov>
Subject: RE: EDITS NEEDED: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Hi Adrian and Wanda,

Yes. We addressed the OAR edits. And OGC approves of this going forward. Attached is a mark-up version that shows all the edits, and a new clean version with all edits accepted.

Let us know if you have questions.

Thank You!

Chuck
Phone: Ex. 6 Personal Privacy (PP)

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Sunday, December 12, 2021 5:04 PM
To: Iglesias, Amber <Iglesias.Amber@epa.gov>; Chang, Alice <Chang.Alice@epa.gov>
Cc: Morgan, Ruthw <morgan.ruthw@epa.gov>; Olson, Heather <Olson.Heather@epa.gov>; Lubetsky, Jonathan <Lubetsky.Jonathan@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>

Subject: EDITS NEEDED: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Please find attached edits/comments from Tomas. Please be sure to send an RLSO back up when completed for ease of review. Thank you!

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Sent: Saturday, December 11, 2021 12:31 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: RE: FOR YOUR REVIEW: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Hi Ann, thanks for this. Here are my comments on the preamble – there are several areas where I've called for clarification or otherwise recommended substantive changes. I'd be happy to take a look at a new version when ready. Best,

Tomás

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, December 7, 2021 8:47 AM
To: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR YOUR REVIEW: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Tomás, the attached is ready for your review and concurrence for sending to OMB. As with the GHGRP rule yesterday, the program hopes to upload this to OMB NLT 12/17.

Thank you,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Mcquilkin, Wendy <Mcquilkin.Wendy@epa.gov>
Sent: Tuesday, December 7, 2021 8:34 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Cc: OAQPSREGPROCESSING <OAQPSREGPROCESSING@epa.gov>
Subject: SAN7546 OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

SAN 7546 - OMB

TO: THE IMMEDIATE OFFICE FOR REVIEW AND TRANSMITTAL FOR OMB

Attached is the OMB package for Mercury Cell Chlor-Alkali RTR final rule. This is a "non-significant" tier 2 action with a court-ordered signature date of May 2, 2022. The signature date for this package is 3/31/21 and we would like to ensure OMB receives this rule by the Dec 17th cut off to upload new projects into ROCIS.

POC: Amber Iglesias
202-564-3175

Wendy

Message

From: Kim, Eunjung [Kim.Eun@epa.gov]
Sent: 10/27/2021 1:02:35 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]; Millett, John [Millett.John@epa.gov]; DeLuca, Isabel [DeLuca.Isabel@epa.gov]
Subject: REVIEW - Weekly Cabinet Report

Hello – please review this week's Cabinet Report by 11:30 today. Thanks!

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Eunjung Kim
Special Assistant
Office of Air and Radiation
Environmental Protection Agency
(202) 815-7252

Message

From: Gibson, Neshawne [Gibson.Neshawne@epa.gov]
Sent: 10/27/2021 7:22:25 PM
To: Gibson, Neshawne [Gibson.Neshawne@epa.gov]
Subject: Administrator's Weekly Report for 10/27/21
Attachments: Administrator Weekly Report 10.27.21 FINAL.pdf; Administrator Weekly Report 10.27.21 FINAL.docx

Hello Administrator Regan and colleagues,

Attached, please find the Administrator's Weekly Report (in both PDF and Word), which includes programs and regional office updates for the week ending October 27, 2021.

Sincerely,

Neshawne Gibson
Office of the Administrator
US Environmental Protection Agency
Phone: (202) 566-1957
Mobile: (202) 603-7617

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 10/27/2021 9:59:24 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Thursday, October 28th, 2021
Attachments: OAR BC Rescission Final Rule Options Select-102621-FINAL.docx; Agenda, Fall 2021 ADD, Final.pdf; 10.28.21 Fall 2021 ADD TPs - Regions and Climate Change.docx; 2021 10 28 PreBrief for Options Selection 2 LDV FRM - Slides.pptx; 2021 10 28 PreBrief for Options Selection 2 LDV FRM- Briefing Memo.docx; 2021 10 28 Call w Cummins - Call Sheet.docx; RE: Materials for PTFCEH Principals Meeting Pre-briefing (Monday, October 25th at 1 PM); Briefing Material - 2015 Ozone Transport Rule: Options Selection OAR Pre-Briefing; 10.28.21 Latest TPs on OAR Activities.docx

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Thursday, October 28, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

October 2021

Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Busy | Tentative | Free
Out of Office | Working Elsewhere | Outside of Working Hours

October 2021

Thu, Oct 28

	All Day	ADD Fall Meeting (1 doc - agenda)
	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Comms weekly
	10:00 AM – 11:00 AM	2015 Ozone Transport Rule: Options Selection OAR Pre-Briefing (email attachment; includes 2 docs and 1 ptt)
	11:00 AM – 11:30 AM	Provide Remarks at ADD Fall Meeting (1 doc – talkers for Joe)

■	11:30 AM – 11:50 AM	Video-call: Tom Linebarger and Jennifer Rumsey, Cummins (1 doc)
□	**11:50 AM – 12:00 PM**	**Free**
■	12:00 PM – 1:00 PM	Rejoin ADD Fall Meeting: Climate Change Session (1 doc – talkers for Joe)
■	1:00 PM – 2:00 PM	President's Task Force on Environmental Health Risks and Safety Risks to Children (email attachment; includes 2 docs and things to note)
■	2:00 PM – 2:30 PM	One-on-One with Chris Grundler
▨	2:00 PM – 3:00 PM	Lead Strategy Team Monthly Meeting
■	2:30 PM – 3:00 PM	Video-call: Prebrief with OAR on Second Options Selection Meeting for Revised Light-Duty Vehicle GHG Emissions Standards FRM (1 doc, 1 ppt)
■	3:00 PM – 4:00 PM	Management Time
□	**4:00 PM – 4:15 PM**	**Free**
■	4:15 PM – 5:00 PM	BC Rescission Final Rule Options Selection (1 doc)
□	**After 5:00 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 10/28/2021 10:10:34 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: Fwd: Scheduling regular OAR/NGO meetings
Attachments: Participants.xlsx

FYI, the NGOs proposed agenda is below. Will raise tomorrow during RT re any adjustments to the agenda and preparation.

Ann (Campbell) Ferrio
Chief of Staff
Office of Air and Radiation
(202) 566-1370

Begin forwarded message:

From: Paul Billings <Paul.Billings@lung.org>
Date: October 28, 2021 at 5:49:42 PM EDT
To: "Campbell, Ann" <Campbell.Ann@epa.gov>
Cc: "Hooper, Daniel" <hooper.daniel@epa.gov>, "Rakosnik, Delaney" <rakosnik.delaney@epa.gov>
Subject: RE: Scheduling regular OAR/NGO meetings

Ann
Attached is our participant list

We like to try to cover this list of topics
NAAQS – Ozone reconsideration
Methane
Power plants
    MATS
    111
    Transport
    SCRs
Mobile Sources
Cars - preemption and 2023-6
Trucks
Haze
NSR and Guidance Documents
SO2 Modeling
SSM
Air Toxics

In response to your questions – I offer the following thoughts. I am sure my colleagues will have additional perspectives

Purpose and objectives – to provide the opportunity to discuss issues of concern and share our perspectives on such issues
Frequency – Monthly
Duration – I think 90 minutes for future meetings might allow for more discussion on more topics

Paul Billings
National Senior Vice President, Public Policy
American Lung Association
Direct 202-785-3988

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Thursday, October 28, 2021 12:11 PM
To: Paul Billings <Paul.Billings@lung.org>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>; Rakosnik, Delaney <rakosnik.delaney@epa.gov>
Subject: RE: Scheduling regular OAR/NGO meetings

Thanks Paul. I expect we'll cover at a high level OAR Updates (15 min). I think it would be good to discuss the purpose and objectives of convening the group and close will further discussion on the frequency and duration of the meetings. If you have thoughts in this regard in advance, I'd love to hear them. I think the rest of the time is yours. If you would send me by the end of today an additions to the agenda and the list of participants, their emails and organizations, that would be great. Thanks!

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Paul Billings <Paul.Billings@lung.org>
Sent: Thursday, October 28, 2021 11:45 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>; Rakosnik, Delaney <rakosnik.delaney@epa.gov>
Subject: RE: Scheduling regular OAR/NGO meetings

Hi Ann
Do you have a list of topics for the agenda to share?

Paul Billings
National Senior Vice President, Public Policy
American Lung Association
Direct 202-785-3988

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Monday, October 25, 2021 8:23 AM
To: Paul Billings <Paul.Billings@lung.org>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>; Rakosnik, Delaney <rakosnik.delaney@epa.gov>
Subject: RE: Scheduling regular OAR/NGO meetings

Good morning Paul. I'll be checking with my folks to see if there are any topics for next Tuesday's agenda to share with you by Wednesday COB. My hope is we can finalize the agenda and participants by COB Thursday in anticipation of Tuesday's kickoff meeting. Does this work on your end?

Best,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation

Office: 202 566 1370

From: Paul Billings <Paul.Billings@lung.org>
Sent: Wednesday, October 20, 2021 12:57 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>; Rakosnik, Delaney <rakosnik.delaney@epa.gov>
Subject: RE: Scheduling regular OAR/NGO meetings

Hi Ann
I'd like to confirm the meeting for Tuesday November 2 at 12 noon.
I will follow up with the list of participants and topics.

Please let me know if you have any questions.

Thanks
Paul

Paul Billings
National Senior Vice President, Public Policy
American Lung Association
Direct 202-785-3988

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Monday, October 18, 2021 1:19 PM
To: Paul Billings <Paul.Billings@lung.org>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>; Rakosnik, Delaney <rakosnik.delaney@epa.gov>
Subject: RE: Scheduling regular OAR/NGO meetings

Great, thanks for your quick reply, Paul. My schedule frees up a bit around 3:30. What's the best number to reach you at?

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Paul Billings <Paul.Billings@lung.org>
Sent: Monday, October 18, 2021 12:52 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>; Rakosnik, Delaney <rakosnik.delaney@epa.gov>
Subject: RE: Scheduling regular OAR/NGO meetings

Hi Ann
Yes I am very interested in these meetings and happy to assist.
I am available today to speak by phone 1-2 or 3-4:30, if you have any availability in these windows or we can at later this week.

Thanks
Paul

Paul Billings
National Senior Vice President, Public Policy
American Lung Association

Direct 202-785-3988

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Monday, October 18, 2021 12:49 PM
To: Paul Billings <Paul.Billings@lung.org>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>; Rakosnik, Delaney <rakosnik.delaney@epa.gov>
Subject: Scheduling regular OAR/NGO meetings

Paul, not sure if we have formerly connected, so allow me to introduce myself. I am OAR's Chief of Staff, Ann Ferrio. I had previously been discussing with John Walke, the idea of scheduling standing meetings between OAR and the key environmental NGOs to further communication. I understand you might be in a better position to work with me to land these meetings. Is this something you would be interested in taking up?

Thank you for your consideration.

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: Patrick Drupp [patrick.drupp@sierraclub.org]
Sent: 10/28/2021 8:09:27 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Regan, Michael [Regan.Michael@epa.gov]
CC: Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Enobakhare, Rosemary [Enobakhare.Rosemary@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Lindsay Beebe [lindsay.beebe@sierraclub.org]; Gloria Smith [gloria.smith@sierraclub.org]
Subject: Sierra Club collection of public comments on haze pollution
Attachments: UtahRegionalHaze_PersonalComments_forEPA_October2021.docx; UtahRegionalHaze_Commenters_forEPA_October2021.docx; PublicComments_RegionalHazeRule_forEPA_October2021 (1).csv

Good afternoon,

On behalf Sierra Club and our 3.8 million members, I am sharing this letter (below) from Lindsay Beebe, Senior Campaign Representative for the Beyond Coal Campaign, and a collection of public comments, requesting action on haze pollution. Please share with any appropriate members of your teams.

Please do not hesitate to reach out if you would like to follow up with us.

Thank you for considering our views and input.

Patrick

Patrick Drupp, PhD
Deputy Legislative Director
Climate and Clean Air
50 F St NW, 8th Floor, Washington DC, 20001
Cell: 717-586-7084
www.sierraclub.org

October 28, 2021

Dear Administrator Regan & Acting Assistant Administrator Goffman,

The Sierra Club respectfully submits this collection of more than 2,000 public comments requesting EPA action to reduce haze-causing pollution from two Utah coal plants. Collectively, we call on EPA to reconsider and withdraw its November 27, 2020 approval of the state's BART SIP, and promptly reinstate the agency's 2016 FIP requiring selective catalytic reduction ("SCR") at Hunter units 1 and 2 and Huntington units 1 and 2.

EPA's November 2020 approval of the Utah BART SIP would not require any new emission reductions at all. The 2016 FIP required 4 SCRs at PacifiCorp's Hunter and Huntington coal plants. The NOx reductions under

the 2016 FIP would have protected all of Utah's iconic national parks, including Arches, Canyonlands, Zion, and Capitol Reef, as well as numerous other national parks and wilderness areas beyond Utah's borders, including the Grand Canyon. And, the Hunter plant ranks second among all pollution sources in the nation, not just coal plants, in its contribution to haze pollution in national parks, while the Huntington plant ranks eighteenth, according to a National Parks Conservation Association emissions analysis. Sierra Club and conservation partners submitted a letter to EPA on June 8, 2021 detailing the technical analysis that supports a reinstatement of the 2016 FIP.

Public engagement on this issue has been through the roof: robust and longstanding. Since 2016, Sierra Club members and supporters have submitted more than 106,600 individual comments to state and federal agencies requesting stronger nitrogen oxide pollution controls be installed on Hunter and Huntington. Additionally, a coalition of more than 200 businesses from Utah, Colorado, and Arizona recognized the regional impact of uncontrolled NOx emissions from Hunter and Huntington and called on EPA to act to ensure pollution reduction. In 2015, The National Park Service, including Superintendents from all five of Utah's National Parks, identified Hunter and Huntington as the two largest contributors to visibility impairment in regional Class I areas and called on EPA to require NOx reductions. Local municipal and county elected officials from Moab, Castle Valley, and Grand County, Utah have made personal appeals to EPA leadership to require pollution controls and clean up the skies and views their communities rely on for economic development.

To this day, Hunter and Huntington remain uncontrolled for NOx emissions. We ask that you listen to these united voices from past and present calling for EPA action, and commit to holding these two massive polluters accountable to federal clean air standards.

Thank you for your consideration.

Sincerely,

Lindsay Beebe
Senior Campaign Representative
Sierra Club Beyond Coal Campaign

Oct. 27, 2021

Dear Mr. Regan and Mr. Goffman,

Thank you for your work at EPA to improve our air quality and for agreeing to serve the American people in the Biden/Harris Administration. I write to you as a proud resident of the West to ask you to please move forward to require pollution cuts from the Hunter and Huntington coal plants, two of the largest sources of haze pollution still uncontrolled for nitrous oxides.

In 2016, the Environmental Protection Agency found that Utah's pollution reduction plan under "Round 1" of the regional haze rules was inadequate because it did not require best available pollution reductions from the Hunter and Huntington power plants in Emery County. These neighboring plants in central Utah are two of the largest sources of sulfur dioxide and nitrogen oxides pollution in the West and are responsible for haze pollution in all of Utah's iconic national parks, including Arches, Bryce Canyon, Canyonlands, Zion, and Capitol Reef, and nearly 100 national parks and wilderness areas beyond Utah's borders. With its 2016 decision, the EPA finally required modern pollution control upgrades for the two plants that would have reduced nearly 10,000 tons of nitrogen oxide pollution.

Unfortunately, last October, the EPA reversed itself and accepted a previously rejected plan from the State that eliminated the need for modern pollution controls or any reductions in emissions at Hunter and Huntington. EPA's about-face approval of Utah's "alternative" to best available controls did nothing to reduce harmful pollution from the Hunter and Huntington plants. EPA's 2020 decision will allow these plants to continue pollution at current levels indefinitely — despite congressional mandates to reduce pollution "as expeditiously as practicable" at such outdated plants.

When states and utilities fail to follow basic federal requirements, EPA has a choice. The agency can hold states accountable and require them to create plans that reduce pollution for the benefit of the people, and if necessary, EPA can create a federal plan that reduces emissions. The alternative is that EPA allows the plant owner Rocky Mountain Power to benefit at the public's expense.

I am asking EPA to rethink its last-minute action in 2020, and to return to its 2016 decision that required these two massive haze-causing coal plants to do their part to reduce air pollution problems across our entire region.

Signed with additional comment from:

I have visited these Utah's parks in previous years and have fond memories of them. It pains me to think they are now suffering from haze pollution. They are so beautiful; please do what you can to remove this hazard and blight from Utah's parks.

Leslie Gelman

Falls Church, VA, 22043

As an emergency physician, I see the effects of air pollution on a daily basis. These pollutants are having their largest effects on children and young people and saddling them with respiratory problems that

they will endure for the rest of their lives. In addition these plants are most likely to be in lower income areas where health care is less readily available, further increasing their risk for morbidities and death.

We should clearly be moving towards the goal of ending the use of coal, however the very least that should be done immediately is to reinstate the 2016 decision to decrease the pollutants released from these plants.

Ellen Leng

Walnut Creek, CA, 94597

I live in Utah and we have the worst air in the country during the winter. We have coal mines/plants, fuel plants that add to the pollution to our air. I am 64 yrs old and have had asthma whole live along with several generations in my family it would be nice to be able to go outside and not cough up a lung ie have a Asthma attack. I'm required to have my car tested every year for Emissions in order to license it so these companies should be required to live up to the regulations required of them.

The air in Utah is becoming bad even in the summer months due to Wildfires in my state and smoke from other states along with the problems from air pollution from fuel plants and coal mines. Enforcement of regulations should be done on these plants/companies. I'm tired of the ones with money being able to buy off the ones in power!!

Cindi Field

Ogden, UT, 84403

We are allowing our National Parks to not only become polluted but to be loved to death. Covid drove many people outdoors and they learned to love nature. It was a problem before but at least we used to have some safety nets. However, under Donald Trump so many safety measures were removed and we are failing to protect our heritage for our children. Even my local parks' areas are becoming severely damaged. So many people are ignorant on how they need to take care of the spaces that they love. Instead we are loving our parks to death. Please, please, Protect Our National Parks for our future generations.

Carol Engle

Phoenix, AZ, 85028

As a Palliative nurse practitioner specializing in serious illness and advanced disease, I have seen first hand the impact of life limiting and quality of life impact in Utah due the pollution thru out the state.

Pulmonary diseases that increase due to outdated coal plants emissions impact all of us with loss of loved ones in life or their inability to be an active member of our communities.

Given all the challenges healthcare has endured these COVID times,

Please take the preventative path and give our Parks and our People a SIGH of relief and impact our healthcare

Meg Randle

Slc, UT, 84105

Your mission is to protect the environment, not the polluters.

Scott Spencer

Philadelphia, PA, 19128

For nearly 40 years i have lived in the shadow of these polluters, documenting the impaired air quality and agitating for action as a federal employee and as a citizen activist defending public lands in Southern Utah. It is past time to get these polluters to clean up their mess, particularly in the wake of Pacificorp and Rocky Mountain Power aggressively working to limit citizen's ability to be compensated for their renewable energy contributions to the grid.

Dan Kent

Moab, UT, 84532

We visit National Parks to escape pollution, not drive through it (fracking being the worst offender by far). It's disheartening to see corporations wanting to mine right next door to Wilderness areas. We need to learn how to produce necessities without polluting the planet we live on.

Lisanne Freese

Chicago, IL, 60646

We the people own the National Parks and need to protect them from corporations that prefer to amass wealth for themselves than to take care of the planet, the environment, and those living on the planet.

Berry Dilley

Athens, OH, 45701

We should be able to see clearly from our National Parks, and the EPA should help see to the helping to restore the grand views everyone should be able to see when they visit our grand National Parks.

Thomas Rogers

Eagle, ID, 83616

The urgency of protecting our environment is now. What better place to start then our National Parks that are supporting wildlife and plant communities. These parks also supply much need outdoor experiences in nature for our citizens and people from other countries. Protect our Parks from pollution of all kinds.

Thomas & Linda Jenkins

Dallas, OR, 97338

We put you in the White House to stop Trump's agenda. We don't want him coming back in 2024, and we don't want our national parks or the environment in general polluted.

John Steiner

Taylorsville, UT, 84123

Your job is to protect life on planet Earth. Get to work!

Vickie Mcalister

Springfield, OR, 97477

RMP plans to continue to operate these plants until 2036-2045. Please make sure they clean up the emissions now!

Joan Entwistle

Kamas, UT, 84036

You must keep polluters in check.

Mike Kutilek

San Jose, CA, 95112

You MUST get rid of fossil fuels in any way possible. We need a world to live in.

Nancy Morgan

Salem, MA, 1970

You have the power to stop putting profit over health and environment. I have asthma and I spend a lot of time in forest and wilderness areas, including our national parks. I love to hike and backpack in these areas and depend on the 'clean' air our parks are supposedly known for. Climate change and the resulting massive fires have caused code reds in our parks and surrounding areas, making it even more critical to stop corporate and industrial pollution in these areas. Corporate pollution is something we can control and must stop, not just for the growing number of those diagnosed with asthma but for everyone.

Heidi Juhl

Juno Beach, FL, 33408

You have the power to help stop the Climate Crisis. You must act!

Kathleen Dolson

Saint Louis, MO, 63121

You don?t know my granddaughter. She is 11 years old. I?m very concerned about the world she is going to be living in. I won?t be here, but what about her, and the hundred of millions of other young people and the air they breathe?

Susan Homer

Albuquerque, NM, 87120

You can't create wilderness you can only destroy it.

Kathleen Van Sandt

North Bend, OR, 97459

You are in a position to put an end to coal generated electricity and to create the circumstances to build the infrastructure necessary to make the switch to cleaner forms of energy. You understand the science of climate change and the consequences of continuing to rely on fossil fuels for energy. Protect the planet and build a sustainable future for future generations.

Scott Mato

State College, PA, 16801

Wr all need clean air to breathe and right now, that?s a freedom not given to everyone. We can do better and must do better.

April Lang

Trumbull, CT, 6611

Wow! When is this country going to do the right thing for our planet and it's occupants!

Pam Abirached

Ocala, FL, 34481

With Senator Manchin putting the brakes on a clean energy plan, we need the EPA to step up and support/enforce stricter clean air regulations. My son is an asthmatic, like nearly 25% of Americans. Poor air quality days can put them in the hospital. If we can't seem to eliminate coal plants then we have to do everything possible to reduce their environmental and societal damage. We must make it uneconomical for them to pursue production. It may be the only way to get to the clean environment we need to exist.

Karen Dye

Chatham, NJ, 7928

Why were the Trump administration's vandalism of the EPA not reversed during month one of the Biden administration? These power-plant polluters should be told to clean up their acts without delay.

Ronald Martin

Fresno, CA, 93726

Why is this important to me? What could be more important than the ability to breath? If there is no effort made to limit/stop the pollutants that these corporations are spewing into the air, then soon we will all lose the ability to breathe. Maybe not today, for you, but definitely in many place already and for many many humans, not to mention plants and animals

Diana Gould

Seattle, WA, 98116

Why are we using coal when there are clean, safe alternatives that don?t pollute our environment? Let?s leave our kids with a better option.

Kimberly Hughes

Mill Valley, CA, 94941

Who doesn?t need clean air to breathe?

Ellen Blum

Tarzana, CA, 91356

When I moved to Ogden, Utah with my Utah-born husband in 11.2004, I had no idea how bad the Air Quality fo the Wasatch Front, in all 7 non attainment counties, was.

By Jan 2013 I started working, pro bono, with many of Utah's CLEAN AIR groups, using my strategic marketing skills to help them educate the general public.

While Methane emissions continue to pollute the Wasatch Front, it is methane pollution and coal burning emission that create regional haze where all of Utah best parks are located in the 4 corners area of S Utah.

The battle to get RMP to close all their coal fired plants and convert them to SOLAR will continue until we succeed. THAT is why I sell SOLAR, mostly residential, to make my living.

Eleanor Thompson

Ogden, UT, 84405

What's the point of profit if there'll be no place to enjoy it? What about those who benefit from parks and not from coal companies?

Jacob Pederson

Los Angeles, CA, 90043

What the Hell!!! Protect our public lands. They aren't disposable for private greed. Protect America! We didn't elect you to squander our heritage. Do the right thing or resign and leave office.

Huntman Vicki

Phoenix, AZ, 85013

What is my vision for the generations of grandchildren that follow me? I swing between despair and hope. I remember the brilliant blue skies of my childhood (1950s). When I talk to younger adults about those memories, they are mystified. They look up and see blue skies, but they do not see the almost turquoise blue I remember. Each succeeding generation loses something.

Pamela Stewart

Skaneateles, NY, 13152

What do you want Your Family to breath, eat or drink?

Mary Rojeski

Santa Monica, CA, 90405

What do they gain when their action endangers their grandchildren?

Al Maze

Plymouth, MA, 2360

What can be more important than the air we breathe? Greed has got to take a back seat to environmental dangers.

Judith Looby

North Fork, CA, 93643

What's my favorite part about planet Earth? You can breath the air!

Charles Robinson

Piedmont, CA, 94611

We?ve solar in our roof. I?m looking at replacing our gas heat with heat pumps. Our 12 year old granddaughter is worried about the world she will live in.

Stuart Knappmiller

Saint Paul, MN, 55106

We?ve done our part by installing solar PV panels on our roof ghat supply our electricity. We break even with Pacific Power. Now it?s past time for you to do your job!

William Fischer

Medford, OR, 97504

We will be held accountable for all of God?s creation. Hebrews 4:13

Janice Fredericks

Wayne, NJ, 7470

We only have this one EARTH!!!

Adriana Crisan

Clayton, NC, 27527

We need to try to reduce and get off of this traditional form of producing power and get into, even more, things such as solar and wind power and hydroelectric and things that are renewable such as that -- because that would help our planet as well as our society and the air quality, which is important, it would help it so, so much and it's what we really need to be doing in the long run and also in the short run, thank you.

Carmen Rodriguez

Union City, CA, 94587

We need to stop using fossil fuels as fast as possible and move to sustainable fuels. Please stop using plastics in our parks and also protect them from bad air by stopping pollution at its source: fossil fuel facilities wherever they are!

Lisa Williams

Jacksonville, FL, 32210

We need to stop relying on coal and other fossil fuels.

Rashmika Kommidi

San Jose, CA, 95135

We need to stop depending on unclean, polluting energy. You have to see the damage being done. Enforce the stricter laws of safety and encourage more renewable energy.

Seems like China is going to be a head of USA in this matter. C. Shunk

Constance Shunk

Ypsilanti, MI, 48197

We need to protect our parks and not allow any business in that will destroy the parks.

We need to keep all the animals that use the park as their home to stay there. Some are fearful of the wolf. He has an important part in our balance of nature. We tried to get rid of him and the grass eating animals thrived eating all the vegetation and leaving the land barren. They had no predator's. We need to have all the animals in the forest to remain. If we find them in our yard that ask yourself, who was there first? We must protect all the animals. We can not use the parks for businesses to make money. Our parks should educate the world and show how to use renewable energies.

Patricia Bradfuhrer

Lake View, NY, 14085

We need to protect Americans from the ravages of lung disease. This pollution from fossil fuels, especially coal, has got to STOP.

John Ulaszek

Mesa, AZ, 85205

We need to preserve our precious National Parks as much as possible.

Tina Lundell

Portland, OR, 97211

We need to move away from coal plants. Mining for coal destroys critical habitat and trees that we need to help in cleaning the air and limiting climate change. We need to stop the air pollution which affects all of us adversely, but especially those with asthma and COPD. Please enforce the laws and regulations we have, and if possible get them strengthened. Thank you for your consideration.

Craig Collins

Winston Salem, NC, 27127

We need to make sure all coal power plants are held to highest standards to prevent human and environmental harm. They should not be allowed to pollute more than other power plants!

Andrew Houlik-Ritchey

Houston, TX, 77092

We need to leave a livable planet for our children and future generations.

Martha Simon

Burlington, MA, 1803

We need to keep the environment preserved for future generations

Diana Young

Portland, OR, 97211

We need to get rid of coal plants. Coal is damaging our environment. That is the best control I can think of for coal plants.

Georgia & John Locker

Fort Collins, CO, 80525

We need to do what we can to have clean air where we live and where enjoy the beauty of nature. Coal and other dirty forms of energy harm our health and destroy our natural world. Cancer and asthma rates continue to rise. Cutting fossil fuel emissions will contribute to lower health care costs and save endangered nature.

Charlotte Bobay

Westerville, OH, 43081

We need to do all we can to help the climate and we need to act now. For the future of our children.

L Huggins

Lansing, KS, 66043

We need to be protecting public lands and parks, as well as people. Good air quality is necessary for all.

Brian Flaherty

Shoreline, WA, 98133

We need to adjust how we get our energy, it is time to move forward and retire coal powerplants and build up non-fossil fuel sources.

Don Patterson

Arnold, MD, 21012

We need the Clean Air Act restored.

Laurie Roddick

Telluride, CO, 81435

We need our national parks free of pollution, and we need the EPA to make this possible. Please work to clean up haze and polluters!

Jessica Fleming

Chicago, IL, 60647

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we need our leaders to stand with US for what is right. what we dont need is our leaders to stand with polluters who care only about profits.

Shelly Running

Winslow, AZ, 86047

We need clean sustainable energy! It is time to stop the big polluters!

Donna Fiser

Georgetown, TX, 78633

We need clean air to breathe and so do trees and all vegetation. It's reciprocal.

Jo Anne Warren

Bellevue, KY, 41073

We must transition from pollution to save ourselves, animals, and insure that the planet survives. How stupid are humans?

Greta Aul

Lancaster, PA, 17603

We must stop taking from the land and start living with the earth. You have the power to make that happen by stopping the pollution of these coal fired plants.

Lee Boggs

Johnston, SC, 29832

We must start to take climate change seriously here in our country and around the world. Let's start by cleaning up our most polluting plants, especially those still using coal. If it's "too expensive" to do so, they need to be shut down. We should not be allowing major pollution to occur!

Mary and Doug Wylie

Arvada, CO, 80004

We MUST save these special places for future generations!

Elaine Fischer

Roanoke, VA, 24018

We must protect the air quality and our climate from the pollution coal plants.

Erwina Peterson

Yakima, WA, 98902

We must protect our national parks from polluters. We're talking about life on this planet so we can breathe healthy air, drink healthy water, and provide for our grand children's life. Do not trade money, greed, or ego for the health of our country.

Ron Collins

Saugatuck, MI, 49453

We must protect our national parks for future generations to enjoy! Polluters can?t be tolerated.

Daniel Swerbilov

Portland, OR, 97213

We must protect our national parks, from being polluted by corporations. We had record numbers of people going to our one of a kind national Park system since Covid. Americans value our national parks

tremendously & we must keep the air quality pristine to attract more visitors both within our borders and in our world. We all need to be awed And feel a sense of wonder that some of the most spectacular scenery in the world.

Kristin Faulkner

Portland, OR, 97206

We must protect our beautiful National Parks from the negative effect of polluters.

Ellen Stevens

Lehigh Acres, FL, 33973

We must protect nature!!

Cristina Vazquez

Waynesville, NC, 28786

We must preserve the environment for future generations. We must address climate change now!

Anne Crossway

Placerville, CA, 95667

We must preserve our protected lands from greedy polluters for the good of all mankind and the future of this planet.

Christi Nash

Arcata, CA, 95521

WE MUST PAY ATTENTION NOW MORE THEN EVER OF THIS CLIMATE MASSACRE ABOUT TO OCCURS!!!!

April Denton

Boca Raton, FL, 33433

We must enforce the strictest controls on all Coal Fired Plants and eventually force them to change over to more environmental safe sources of energy in order to preserve our planet, have clean air to breathe, and begin to control climate change. There is not an option if we wish to have a livable planet for the

future and for our grandchildren. Please reinstate the controls and move toward better options for the future good of the country and the planet.

Margaret Boles

Mitchellville, MD, 20721

We must do everything we can to hold dirty fossil fuel companies accountable and stop climate change if we are to save the planet

Carina Campobasso

Winthrop, MA, 2152

We must do everything possible to mitigate the horrific results of our using coal and fossil fuels. There are alternative sources that can get us back on track and save our planet.

Lorrie Drogin

Altadena, CA, 91001

We must build back better, and protect our national monuments, refuges and forests from devastating fossil fuels drilling and fracking. The environmental protections that were dismantled by the Trump administration must be reinstated. Fossil fuels are fading into the past. We need clean, renewable energy sources as we look to the future.

Eric Aberle

Drexel Hill, PA, 19026

Well, because nobody wants to breath toxic fumes from burning coal. It really is that simple.

Earl Grove

East Canton, OH, 44730

We live in OK and all but one of our lakes had mercury levels so high from the pollution from coal fire power plants that it is unsafe to eat the fish. We need to shut down coal plants.

Susan Schmidt

Oklahoma City, OK, 73112

We hurt ourselves when we pollute the earth.

Rhonda Parsons

Rockford, IL, 61114

WE HAVE VERY LITTLE TIME TO SAVE OUR PLANET! YOU MUST HOLD THESE GREEDY COMPANIES ACCOUNTABLE NOW!

Janice Solektefft

Underhill, VT, 5489

We have to stop the coal production. We have to save our planet for our descendants!

Linelle Diggs

Hornbrook, CA, 96044

We have to end coal before it ends the human race on our mother earth...!!!

Stephen Hackney

Virginia Beach, VA, 23454

We have to do something now to correct Climate Change. We may already be over the threshold of no return.

Charlotte Cook

Cincinnati, OH, 45238

We have to be able to breathe fresh air, no brainer.

Sarah Hamilton

Canastota, NY, 13032

We have the technology to improve our air quality and reduce the harmful impacts of such pollution. This needs to be a priority.

Kathy Sabatini

Fair Oaks, CA, 95628

We have the opportunity to protect some of the cleanest air in the world coming off the Pacific Ocean. By putting filters on these emission points, we can preserve our clean air and produce power. clean air, clean living.

Nadine Chapdelaine

Garberville, CA, 95542

We have plenty of energy material, so what becomes more important, the park or coal production? An easy choice. Leave it in the ground.

John Webster

Dublin, OH, 43017

We have ONLY ONE planet to live on

Terry Sailer

Pattison, TX, 77423

We have one chance to get this right. Thank you.

Sandy Floyd

Yakima, WA, 98902

We have one beautiful earth! It belongs to all of us, not just mega companies. It is not yours to use as you want. Please change the destructive practices. Protect Mother Earth!

Thank you

Marilyn Altenbach

Lawrenceburg, IN, 47025

We have little time left to mitigate the worst of climate disruption. Please, for the health and well being of all species, human and animal, do what is right?.cease the pollution in public spaces and beyond. We cannot afford to not pay attention. Thank you for paying attention and taking care of our planet.

Emily Sloan

Worcester, VT, 5682

We have a duty to keep people and the environment safe for now and for future generations.

Marion Barnes

Maplewood, NJ, 7040

We can?t wait any longer! Tell the coal plants to clean up their act now.

Kimberley Jackson

Orinda, CA, 94563

We can?t drag our feet any longer! It is time to take meaningful full action to transition from fossil fuels, first step is to restore the environmental regulations rolled back by the previous president!

Joel Hurd

West Linn, OR, 97068

We can replace these two dirty, obsolete power plants with solar energy. At the very least, make them clean up their act.

Patrick Bosold

Fairfield, IA, 52556

We cannot keep poisoning ourselves--foul air travels and affects everyone on some level--if we expect to survive.

Sandra Danu

Chevy Chase, MD, 20815

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we cannot even begin to address the climate crisis if you don't at least enforce the most stringent controls possible on the most polluting coal plants in the West.

Nancy Empson

Olathe, KS, 66061

We cannot continue to kick the can down the road on clean air and climate change

John Warfel

Block Island, RI, 2807

We cannot allow these unbridled polluters to foul our air, water, and land-we and all other animals have no other place to live but here on earth, and we all MUST take care of our home!

Emery Goff

Portland, ME, 4101

We can get fuel from other sources, we can't get natural lands anywhere else- they take centuries if not millennia to grow, and once destroyed we can't get some of these habitats back.

Serena Bolliger

Washington, DC, 20003

We breathe to live. You pollute our air, foul our water, poison our foods, we become sick and die. Our children, your children have a right to a cleaner environment than we are led to believe is necessary. It isn't. There is a better way. Help us survive and we all benefit.

Brian Nolan

Stroudsburg, PA, 18360

We as a nation have allowed pollution of air and water to go unchecked for far too long and it needs to stop. Regulations are not going far enough to give us back clean air.

Julie Peckham

Austin, TX, 78757

We are stewards of our earth. It?s up to us to protect our natural resources for generations to come. In the face of worsening climate change it?s now more important than ever to make healthful environmental decisions. Nothing is more important than clean air, soil, and water. Not even profits.

Donna Hansen

Grants Pass, OR, 97527

We are stewards for the earth

Neil Michael Cloyd

Montrose, CO, 81401

We are out of time to do something about carbon emissions. We need bold action to maintain a livable climate and planet, and this action is a no-brainer.

Leana Zang-Rosetti

Oakland, CA, 94602

We are killing our environment and people with pollution!

Peggy Meyer

Baltimore, MD, 21201

We are in a race for survival - including the survival and health of future generations of humans on earth. Why would we want to perpetuate the problems we have already created by allowing companies and utilities to pollute our air and water? Are we lemmings? or are we the intelligent folk we say we are? Please take a stand for our future!

Mary Ellen Snyder

Zionsville, PA, 18092

We are asking you to end the use of fossil fuels as soon as possible. The evidence for climate change is impossible to ignore and we trust you to make the right decisions to help reduce pollution and improve air quality. This is a huge problem in the state of Utah and requires your support now. Thanking you in advance of your positive action

Colin Thacker

Salt Lake City, UT, 84102

We are all connected. Us on the East coast already have more gray mornings than ever do to wildfires. Let's at least save western national parks, which belong to us all!

Ann Palmer

Hyattsville, MD, 20781

We ALL need to work together in order to SAVE and protect OUR Environment, Wilderness and Wildlife that live there!!!

Tracey Bonner

Arlington, TX, 76014

We ALL need clean air! I urge you to do the right thing and regulate the coal plants!

Rachel Katz

Berkeley, CA, 94703

We all know coal burning is a major contaminant of our air and atmosphere. We all know there is money in this game and that money will be made despite all the negatives. We know we have to take away the ability of those who make money off our environment by controlling their behaviour. What I don't understand is why we are so invested in the wrong form of capitalism that allows us to ruin our air, lands and water so that we avoid looking beyond our noses. Why are we allowing these wrong policies to continue? We must stop this incredibly short term way of viewing our current lifestyles. Please, please, put your integrity before your politics and do what is right.

Manjula Menon

New York, NY, 10013

We all have a right to clean air

Sandra Bsylis

Munger, MI, 48747

We all deserve to live in a pollution free environment. Now is the best chance we have to take substantial action by to assure a pollution free environment. Clean up or, even better, start to eliminate coal plants.

Diane Fuchs

Philadelphia, PA, 19146

We've got to STOP supporting our current harmful and unsustainable energy practices. It is a matter of survival. PLEASE phase out coal production ASAP. We cannot afford to wait!

Christina Farnsworth

Pacific Grove, CA, 93950

We've already started down the road to making our Plant Uninhabitable.

If we continue with the all polluting what will the Future Hold ?

Do you want to Really Cook US ALL to DEATH when we loose our OZONE LAYER ? Or not be able to Breathe because we've Polluted the Air So Bad ?

Stop the Polluting, PLEASE if Not for Our Sake, then Our CHILDREN and OUR CHILDRENS CHILDREN.

Scott Hottinger

Heath, OH, 43056

Undo the damage Trump did!

Mark Francis Glessner

Casper, WY, 82601

Under sane governance it would be unthinkable to knowingly allow things that cause measurable harm to people and to the world we're inexplicably intertwined with. Please take us one step further into sanity.

Tara Strand

North Hollywood, CA, 91601

Uh, duh....I am not an environmental scientist, but I can see the brown layer of pollution over the Salt Lake Valley, today, October 21, 2021, on a day NPR/KUED said we are 'GREEN' air quality!!!

Nancy Weiser

Midvale, UT, 84047

TRUMP IS SATANISM

Richard Spratley

Broomfield, CO, 80020

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trump is a thug and a moron. lock him up.

Kenneth Cross

Washington, UT, 84780

Trump did nothing to help with the climate change situation. We need to do something NOW, the coal industry is part of the problem.

Renie Olson

Timnath, CO, 80547

Trump and his ill-picked administration were a fiasco. None, including Trump, were fit for their respective posts.

EPA, please do the job your were meant to do...protect us, protect the environment.

Thank you.

Keith Crudgington

Fairfield, CT, 6825

Trump's EPA took us at least 50 years backward in protecting our air and water. It is time to fully restore these protections. Thank you.

Lucas Hatton

Davis, CA, 95616

Trump's Environmental Protection Agency (EPA) allowed some of the West's largest polluters to avoid Clean Air Act rules. Now Biden's EPA has a chance to hold these companies accountable for their unchecked air pollution, cleaning up the air we breathe and clearing up the views at our national parks.

Russell Symonds

Costa Mesa, CA, 92627

Trump's Environmental Protection Agency (EPA) allowed some of the West's largest polluters to avoid Clean Air Act rules. Biden's EPA must hold these companies accountable for their unchecked air pollution, cleaning up the air we breathe and clearing up the views at our national parks. It's our air, there are no excuses. Holding these two coal plants accountable is one of the most immediate and

impactful actions the EPA can take anywhere in the country to protect our air quality and our climate from polluting coal plants. Act immediately.

Kathleen Corby

Pine Plains, NY, 12567

Too many spots were damaged in trump's time. They need to be fixed AND protected. And for climate change we need to stop all fossil fuels, not allow them to fowl our air and atmosphere.

Marilyn Britton

Peterborough, NH, 3458

To breathe clean air

Denise Sprague

Wall Township, NJ, 7719

Time is running out for making the changes needed to save the environment for future generations.

Susan B O'connor

Cookeville, TN, 38506

Thousands of Americans of all backgrounds love our National Parks. A no brainer. We should be able to visit without pollution from coal.

Susan Strauss

Bend, OR, 97703

This pollution is killing us. It must stop.

Mahalo,

Barbara Barry

Barbara Barry

Haiku, HI, 96708

This planet is currently the solely one that humankind needs to survive. Care it well.

JYH Lay

Kearny, NJ, 7032

This petition is truly personal to me. Pollution from coal power plants is not only responsible for harmful haze and nitrous oxides in our atmosphere. It is one of the most potent contributors of the greenhouse gas Carbon Dioxide, the main source of global climate change heating up the planet, responsible for exponentially increased risk of drought and wildfires in the West. We should do anything we can do to mitigate that risk.

Peter Volz

Canoga Park, CA, 91303

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this must be done to protect all of us !!!!

Joan Hunt

Edmonds, WA, 98026

This matters to me because it impacts the health of everything being that lives in America

Jeffrey Blackman

Tucson, AZ, 85717

This matters because we deserve to have our National Parks free from pollution; they are sacred and they belong to all of us!

Sharon Goodremote

Hamburg, NY, 14075

This matters because I know that we cannot have it both ways- our cake and eat it too, waffling and dancing with life and with money too. It doesn't work this way.

Can't we do one thing right- the planet in which we inhabit. THEN we can get down to other business- because then we can breathe, have a better quality of life and really learn to care for one another.

Margaret Sherwin

Alamosa, CO, 81101

This matter because our ability to live on this earth matters

Kathryn Knowlton

Portland, OR, 97213

This is your chance to get us back on track.

So get us back on track! Protect our planet's resources so that our generation and the next may enjoy this wonderful Earth.

Savannah Dali

Denton, TX, 76210

This issue matters to me because, pollution is a problem. I believe we need to take care of the earth! It is in the best interest of the citizens of the world take a stand, & take care of these problems as quick as possible. So that the world we live in will be a better place.

Rainy McCain

Bloomingdale, OH, 43910

This is a Two-fer . . We must protect our parks AND greatly reduce dependence on and drilling / mining for fosil fuels.

Richard Robinson

Waterford, CT, 6385

This is an EMERGENCY! Please do your job!

Laura Langham

Sacramento, CA, 95827

This is an antiquated and unsustainable source of energy that needs to be changed immediately

Susanne Hesse

Alachua, FL, 32615

This is a known critical issue helping fuel climate change! Time to use better, cleaner solutions. We are a breaking point and tipping over can not be our choice. Shut them down!

Elizabeth Meyers

Hallandale Beach, FL, 33009

This is a huge issue for the welfare of everyone in the world and our Earth!

Debbra Smith

Salt Lake City, UT, 84158

This Earth can't take anymore! Keep your promises to Green energy for her. Applause for the Bear's Ears and Grand staircase Escalante.

Dawn Donivan

OGDEN, UT, 84401

This, like numerous other issues (climate change, gun safety, immigration reform, prison reform, education reform, short-term lending regulation, healthcare reform, banking regulation, opioid regulation) remains a vexing problem primarily due to corporations' ability to curry favor with elected officials. The corrupting influence of money in our political system is undermining our democratic traditions and discouraging Americans from voting and/or running for office. This ominous development may well end our experiment in representative democracy unless we alter this decades-long trend. For the sake of the republic, we must amend the US Constitution to state that corporations are not people (and do not have constitutional rights) and money is not speech (and thus can be regulated by state and/or federal campaign finance laws). Short of accomplishing this, no other reform of significance will be achieved.

James Klein

Corpus Christi, TX, 78411

The world needs to go off coal, and the U.S. needs to show the way. Thank you. Our kids and their kids depend on you.

Lisa Hand

Rochester, NY, 14618

The use of coal needs to end. Everything about coal is bad. From the mining, which often entails mountaintop removal, underground fires, black lung disease, to tons of carbon in the atmosphere when burned. It ruins animals habitats and causes asthma and cancer in man. And when it is mined and burned, it leaves behind toxic coal ash which blows into the air and sits in sludge ponds which have broken and spilled onto the land and into our streams, rivers and lakes. The time to switch to clean energy is mandatory for a clean, healthy planet.

Mary Junek

Mukwonago, WI, 53149

The time for coal and fossil fuels is over. The SCIENCE has PROVEN that these forms of energy have done nothing except degrade the environment, and we're fast approaching the tipping point. You were elected to represent your numerous constituents, NOT THE FEW WEALTHY who focus on profits above all else! And I'm aware that these same few wealthy donate heavily to your campaign -- have you no conscience? Will your children and grandchildren be proud of what you have done? And will they be able to thrive in an environment becoming increasingly hostile to human life?

Do the job you were put into office to do -- represent your constituents! We will remember your actions, and actions have consequences when election time comes.

edward krausnick

Ocala, FL, 34474

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the time for action is now

mark juergens

Chelsea, MI, 48118

These parks are the legacy we leave for future generations. Science is real!

Savannah Marker

Mapleton, UT, 84664

These parks are our nation's jewels.

Celeste Rogers

Kapolei, HI, 96707

These parks are a natural treasure. I want my children and grandchildren to be able to enjoy them in their pristine state.

Lisa King

Sarasota, FL, 34237

These National Parks are replaceable and need more protection. Please do the right thing

James Doyle

Seattle, WA, 98115

These large plants that emit sulfur dioxide and nitrogen oxides are likely adding to greenhouse gas emissions as well. Everything that can be done to reduce air pollutants must be done as soon as possible. Every action adds up. We must act on all fronts to stop climate change.

Jane Kwiatkowski

Eugene, OR, 97405

These companies are getting away with devastating our environment and then making taxpayers foot the huge bills for cleanup, excpet nothing can claenup the dirty air they are creating which is burning up our planet.

Bill Woodbridge

Goleta, CA, 93111

These coal plants pollute some of the most important public lands in our country. Please help stop this travesty.

Stephen Bannister

Salt Lake City, UT, 84101

These coal plants must be held accountable!

Julian Yerena Jr

Parlier, CA, 93648

These coal plants create enormous pollution that are the source of debilitating asthma in children and others and increase health care costs enormously. They spew GHGs that move us closer and closer to climate disaster. There can be no question that the haze rules need to be revised!

L Wharton

Bethesda, MD, 20816

These beautiful natural parks are priceless wonders that must be protected and preserved.

John Stout

Boston, MA, 2130

These are our public wild places and they must be protected from the greed of private industry.

Doris Mendez-DeMaio

PALM BEACH GARDENS, FL, 33412

These areas must be kept pristine.

James Aldrich

Tallahassee, FL, 32317

The science doesn't lie coal is the worst of the fossil fuels regards total pollution. The more we cut coal use the better off we'll be in the future. Our best idea is our National Parks to sacrifice them for planetary destruction is beyond insane.

Richard Van Aken

Churchville, PA, 18966

There?s no denying it. The earth is in trouble. Please put back into place the controls we need to stop pollution especially for The Hunter and Huntington coal plants, two of the biggest sources of pollution.

Ann Houston

Brooklyn, NY, 11222

The Republicans are terrorists and the Democratic Party is nothing more than a bowl of cooked spaghetti. I have been a Democrat all my life and as of now I'm embarrassed to call myself a Democrat.

Two Senators are holding up President Biden's agenda and it is a shame. Democrats will you ever grow a spine?

Paul Comtois

Ludlow, MA, 1056

There is no time to waste on enacting essential pollution cuts for a healthier environment and to stem the forces of climate change. Please act quickly to require the necessary updates to these plants.

Colleen Devlin

Monterey, CA, 93940

There is no time to lose to reduce the impact of climate change and the health efficts of air pollution Out children and grandchildren depend on us taking action NOW!

Sharon Piekarski

Pleasanton, CA, 94588

There is no planet B. Thank you very much.

John Oda

San Francisco, CA, 94115

There is no Planet B

Linda Wing

Chicago, IL, 60614

There is no more time to wait to act. We must do all we can to build a better world to leave to our children and grandchildren.

James Patterson

Avondale Estates, GA, 30002

There is no excuse for knowingly abusing the natural environment which has put our one and only planet in crisis mode ? any more.

No planet, no people. If you are aware your emissions are harmful, STOP !!

Dana Bachman

Sonora, CA, 95370

There is just no excuse to use coal. The federal government needs to lead the conversion to renewable energy

Mary Ann Sward

Corvallis, OR, 97330

There is asthma in my family. Please don?t contribute to their health problems.

Paige Temple

Chicago, IL, 60645

There is a better way with geothermal and $18B is being pumped into exploring that avenue?coal is so last century! Yuck!

Laura Coleman Siddons

Portland, OR, 97211

There are other viable alternatives that don?t impact the environment in a negative way.

Patricia Nugaris

Bend, OR, 97701

There are around 100,000 premature deaths attributable to air pollution, much of which comes from the burning of coal. Much more stringent controls are need on coal burning power plants.

Richard Taylor

Temperance, MI, 48182

There are already sign in National Parks detailing what we could see if the air were clear. Not to mention that we have to breathe that polluted air all the time. Please do everything you can to clean up the air and help us breathe.

Becky Yih

Park City, UT, 84098

The quality of our air affects all forms of life on this planet. Please listen to our requests to stop polluting the air when there are many safer alternatives!

S Lynn Lake

Brownsburg, IN, 46112

The quality of air we breathe impacts everything. I want my kids to be able to breathe clean air without the need to wear mask or worry about asthma attacks. As your social responsibility please act appropriately for the better good.

Ania Borto

Stoneham, MA, 2180

The pollution that these plants discharge into the atmosphere does not remain within the borders of the state of Utah. The prevailing winds carry that harmful pollution eastward. People across most of our nation must suffer the consequences.

Royal Chamberlain

Rochester, NY, 14619

The pollution from these companies affects all life, humans included! How can the EPA continues to allow higher levels of pollution ? Our planet has a delicate balance between life death for countless species of plants, animals and humans. We have the technology to reduce pollution?it?s the EPA?s job to protect life in this country?you have to be the leaders and examples for other countries to follow suit in reducing pollution and maintaining quality of life of the planet.

Martha Nikas

Ipswich, MA, 1938

The past decade of wildfires has made us hyper aware of the poor air quality we experience both during the wildfire smoke event and the enduring ozone and other small particulate poisoning our environment.

We must end this tolerance of poisoning many so that a few profit.

Dona Wallace

Golden, CO, 80401

The parks of the west are what brought me back my happiness and my sanity, and after guiding in the area for years I switched to taking my family there every spring to enjoy the beauty, quiet, and expanse. Our world will suffer enough from climate change even if we could stop all pollution now. Additional pollutants on the land, in the water, and in the air are not the legacy I want to leave to my grandchildren.

CD Shrack

Corvallis, OR, 97333

The parks belong to everyone, not industry only. Stop polluting in the name of the 'dollar'.

Jodi Escalante

Port Washington, WI, 53074

The parks belong to all of us and to all the living creatures who make the park the place it is and the place we value so deeply. It is utterly unethical and unconscionable to allow these places to be polluted, contaminated and desecrated by those who see them as mere exploitable resources. It is imperative that we cease to cater to such a base and myopic mentality and instead commit to conserving and managing these last places of wilderness and beauty for all time.

Marya Bradley

Milwaukee, WI, 53202

The outdoor lifestyle is what elevates Utah and brought us here! I want my nieces to be able to experience clean air and water here as they grow up!

Leila Schey

Park City, UT, 84098

The national parks belong to all Americans and must be protected from the pollution caused by fossil fuel production and use.

Edward Temple

Brooklyn, NY, 11215

The National Parks are our crown jewels of public lands, meant to exemplify unique habitats and ecosystems. But they do not exist as islands unaffected by the surrounding land, air and water and air pollution standards which were weakened under Trump's EPA must be restored and enforced if we are to not only protect our Parks as they were meant to be but also the air we breath and our health both in and out of the Parks.

Todd Davis

Boise, ID, 83703

The national parks are for the people, nature and wildlife, not for corporations for resources that pollute and deface the environment.

Cynthia Carley

San Mateo, CA, 94401

The longer we wait to undo Trump's disasters, the harder it will be to make a difference. The time to act is NOW!

Elizabeth Struthers Malbon

Blacksburg, VA, 24060

THe last areas of wilderness need protection.

Judy Burnam

Springfield, VA, 22152

The IPPC has given us a clear message: CODE RED EMERGENCY ! That means we need to stop using dirty pollutants like coal NOW! It is crucial that we do that and that we make every effort we can to protect our national parks from polluters !

Virginia Jones

Kalamazoo, MI, 49048

The Hunter and Huntington power plants in Utah need to be held accountable for the pollution they are creating. Please require modern pollution control upgrades for the two plants. These pollution controls are long overdue. They should be made to comply with the Clean Air Act.

Deborah Continenza

Chardon, OH, 44024

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the health cost of coal is paid by the public not the electric generator.

David Murray

Cornville, AZ, 86325

The future of our species and all species. The planet!

Joy Singer

Martinsburg, WV, 25404

The furture of the planet is at stake. Let us come together and reason for the good of us all and not jut a chosen few.

Maria Caturay

Maria Caturay

Millbrae, CA, 94030

The ethical thing to do is to reinstate the regulations that were weakened by the Trump administration and create new legislation to ensure protection moving forward.

Kirsten Diedrich

Reading, PA, 19608

The EPA should do its job; not be the shoe shiner for fossil fuel corporate interests.

James R Monroe

Concord, CA, 94521

The EPA must take actions to change the polluting policies of the corrupt Trump administration. Our environment must be afforded better protections from polluting special interest corporations and individuals. EPA must establish strong environmental protections for all of our public lands including our National Monuments, National Forests, National Parks, National Riverways, BLM lands and Marine Reserves. This can be achieved through strong protections against air pollution, water pollution, solid

waste pollution and providing larger buffer zones around these areas. Please implement these stronger protections and include adequate penalties and enforcement.

Larry Lambeth

Springfield, MO, 65810

The EPA must protect our National Parks from polluters, especially the coal plants out West. This is part of the EPA's mandate. The pollution from burning coal is bad enough but we must now contend with the impact of carbon on our atmosphere too. Find a way to help save the planet. Minimize the impact of coal burning today and figure out a fast way to replace it with earth-friendly sources of power tomorrow.

Michael Carter

Annandale, VA, 22003

The EPA is there to protect us from polluters. Disband/replace them if they don' t do their job.

ann malyon

oak, NJ, 7436

The EPA is our defense against pollution, and we depend on you. In the 49 years I lived out west I saw how fragile that ecology is. And my family suffered from bad air quality. Please meet your responsibility to protect us from degraded air!

Marion Black

Akron, OH, 44303

The EPA's job is to protect people and the enviornment. Do it.

Jeff Baird

Sandy, UT, 84093

The environment is a natural resource and must be protected from harmful commercial interests like coal.

Linda Maher

Austin, TX, 78720

The entire planet depends on stopping big polluters, which is your job to stop violators. Or does the law and permt rules matter anymore?

Paula Proctor

Clinton, MD, 20735

The effects of global warming may well be irreversible at this point but we need to protect our environment as much as we humanly & humanely can. Stop the polluters now!

Jenny Henson

Dixon, IL, 61021

The dirty air from those coal plants have made it very difficult to my son to breath at times, and made his asthma much more severe.

Joanne Hesselink

Neshkoro, WI, 54960

The devastating effects of climate change demonstrate to us every day that we are long past the time when we can kick the can down the road on transforming the methods by which we produce energy to cleaner, greener power. Earth's fragile balance is what sustains the conditions that allow us to exist out here in the universe, yet we are jeopardizing that to perpetuate a modern Western way of life that is ultimately suicidal.

The solution doesn't need to be reinvented. For centuries on this continent, indigenous peoples thrived here by following the principal of acknowledging that we mortals do not own the natural world, and accepting individual responsibility for its stewardship for the benefit of the subsequent 7 generations. We have greener technologies, and we are smart enough to develop more. There is no excuse and there is no time left to delay the transition to greener power.

Please take whatever action is necessary to stop this pollution now.

Thank you.

M. Carroll

Lansing, NY, 14882

The decision to allow more pollution in our National Parks is a disaster and a shame on one of the most treasured part of the United States. Billionaires should not have a say or be able to make deals on public lands let alone the disaster climate destruction for the entire planet. Please reverse this terrible Trump administration policy

Judy Vance

Albany, OR, 97321

The cost of reducing air pollution is much less that the health care cost caused by air pollution.

Robert Dickinson

Bloomfield, CT, 6002

The continuing sustenance of humans on this planet depends on protecting its environment from the harm we have caused for too long.

Edward Landler

Los Angeles, CA, 90065

The clock is so close to midnight. All of us are now living in some of the seemingly irrevocable results of climate change. There is no time to waste. I'm 68 but my six grandchildren are all under 4 years old. Let's do everything we can to eliminate the egregious sources of man-made climate change.

Elliot Margolies

Palo Alto, CA, 94306

The clean air and water of the west is a national asset. We must enforce current laws and eventually get rid of coal altogether.

Nicola Nelson

North Salt Lake, UT, 84054

The best choice would be to close all coal plants. We don't need coal any longer. We have better energy choices that don't pollute.

Second best? Inspect coal plants often and strongly enforce all pollution laws (clean air, clean earth, clean water) regarding them.

Sue Batchelor

Bryan, TX, 77803

The beauty of nature in our National Parks is a treasure that we must protect. Please do your best to keep polluters from ruining these natural wonders. I hope they remain natural and beautiful to be enjoyed my my children and their children!!

Gary Webb

Greenwood, IN, 46142

The American West is unparalleled in beauty and majesty. We must preserve this by doing everything in our power to stop dirty polluters. We have to act decisively and quickly..

Emily Pfeiffer-Russell

Bakersfield, CA, 93312

The air we breath is crucial to how we live.

Randolph Schoedler

Milwaukee, WI, 53208

The air quality has a direct effect on the ability to breathe and the increasing number of people having asthma and other life threatening breathing disorders is not acceptable!

Carol Villaggio

Cromwell, CT, 6416

The air ,land and water gets dirty enough and the coal plants add to it. Global warming will make things even more dangerous for all life, so close the Hunter and Huntington polluting coal plants NOW. Thank you on behalf of all that live.

Saran Kirschbaum

Los Angeles, CA, 90035

The age of coal must end to protect our future. Our wild places must be preserved to enrich the lives of all Americans. There is really no more time to lollygag!

Sara Bruce

San Jose, CA, 95110

The age of coal is over and we must do everything possible to combat climate change. I want to leave a planet to my grandchildren that is inhabitable rather than one that's destroyed by climate change. My home state of California is dry and burning and the East is suffering from extreme storms and floods. Climate change is here now and it's almost too late to act.

Mary Slaughter

Silver Spring, MD, 20901

Thank you for requiring that these companies change, NOW, so that human, animal, and plant life in this huge area can survive and thrive. No waffling, no 10-year plans, but change now.

Jackie Melvin

Eugene, OR, 97402

Thank you for carefully considering my request; and for your work toward a healthy, just, and peaceful planet; because the earth is the only planet for all of us.

Russell Fletcher

Santa Fe, NM, 87507

Thank you for all that you do to stand up for this beautiful earth so we can live in harmony with the land and environment, not force it to silently battle against us.

Lauren Evrard

Mansfield, TX, 76063

Talk about a no-brainer ... why do you even need public comment for this?! OF COURSE our nation's parks deserve protection from profiteering polluters!

Beth Jones, Expat

Anamosa, IA, 52205

Stop the sixth great extinction!

James Rodell

Corvallis, OR, 97330

Stop the pollution from coal plants destroying OUR environment and hurting the health of Americans !

Mark Fields

Ocean Ridge, FL, 33435

Stop polluting Our National Parks !!

David Baca

Berkeley, CA, 94720

Stop poisoning our air!!!!

Joyce Coombs

Corryton, TN, 37721

STOP KILLING THE EARTH.

START SAVING ALL LIVING THINGS.

Inez Hileman

Orinda, CA, 94563

STOP DIRTY COAL NOW.

Karin Smith-Spanier

Kingston, NY, 12401

Stop destroying our precious planet...global warming must be stopped ASAP.

Anne Monticello

Valdosta, GA, 31602

Standing at the Desert View lookout at the eastern end of the Grand Canyon and seeing nothing -- literally nothing but haze was a shocking experience. The ranger told me it was power plant pollution,

and that it had become commonplace. Is this what we are so proud of as one of our nation's treasures? America's Best Idea is being erased. We must return our parks to a state in which they live up to their extraordinary reputation.

Pat Hackbarth

New York, NY, 10023

Sounds good

Mariette Robertson

Saint Martinville, LA, 70582

So once again the EPA is the Environmental POISONING Agency instead of the Environmental PROTECTION Agency as it was intended to be when created by Republican President Nixon so many years ago. (at least he did something right). Please rethink this.

Chris Dacus

Bell Buckle, TN, 37020

Some people just do not get it....Why don't they understand that if we clean up our air and our water, we will reduce disease and illness. These ailments cost us hundreds of thousands of dollars in medical expenses. Do we want a healthy society or not?

Wendy Slaby

High Ridge, MO, 63049

Some people in my family have asthma. Clean air is very important to everyone, but for people with asthma, it's life and death. We have the technology to reduce our carbon footprint for a life sustaining planet for my grandchildren and their children, who will live far beyond 2100. Let's give future generations a fighting chance by forcing polluting coal plants to clean up our air.

Christine Baldonieri

Latrobe, PA, 15650

Shut these murderous, ultra destructive coal power plants down.

James Roberts

Sandpoint, ID, 83864

Shut these coal plants down! We don?t need to rely on fossil fuels any longer. Stop polluting our planet and help clean it up. No more coal plants. Those workers can learn a new trade and get new jobs. It?s happened before and they would feel better in the end not to be polluting anymore.

Carol Elkins

Aumsville, OR, 97325

SHUT DOWN COAL PLANTS!!!!

Wayne Pipke

Rocky Hill, CT, 6067

Science clearly shows that coal damages all levels of our lives here. We collectively call for you to control, limit, and end all coal plants. We all need clear air and water. Coal control is a necessary step. Thank you for doing the right thing.

Jennifer Murphy

Milwaukie, OR, 97222

Save the world for our grandchildren!!!!!!!!!!!!

Jeanne Fobes

Newport Beach, CA, 92663

Save the future for our childern

Rick Anderson

Rapid City, MI, 49676

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save public space to combat climate change.

Alice Tseng

Ventura, CA, 93003

Save our National Parks and clean water from any sort of polluters!

Gloria Walker

Overland Park, KS, 66214

Research based evidence helps man kind determine best practices

My 40 years of living by the 14 largest coal burning power plant is that evidence of the effect of breathing air that has continued to cause my asthma to be symptomatic. Rescue inhalers are part of my life now.

Please protect the air quality of our world, therefore protecting our humans and other living creatures.

Celeste Smith

Saint Albans, MO, 63073

Reducing the WORST polution is the least you can try to do.

Jacob Wittkamp

Milford, IA, 51351

Reducing pollution anywhere effects everyone. Please take the title of your agency seriously and act in the best interest of the ENVIRONMENT, not polluting big businesses. That is your charge, there is no responsible way around it.

Sierra Bright

Dover, MA, 2030

Recently, I had a severe Asthma attack. Prior to this, I had never had one. I couldn't breathe and my lips turned blue! Please for the sake of future generations, we need to protect them from this unneeded and unwanted pollution. Thank you.

Linda Engels

Portland, OR, 97213

Really??? You need to be told this is bad???

Rand Friedenfels

Medford, WI, 54451

Rarely have I been encouraged by our government doing anything positive..Good for this earth.. Please Michael; Help us all to work toward saving in as many demonstrable ways as possible that we can start turning our environment back to a healthier level

Deight Hightower

Gardiner, OR, 97441

Protect the earth for future generations.

Jennifer Gaspar

Alpena, MI, 49707

Protect our national parks from polluters. Please rein in the coal companies.

What kind of planet are we leaving for our grandchildren?

Ann Green

Pisgah Forest, NC, 28768

Protect our lands, and that goes for you Republicans....

Steven Greek

Justin, TX, 76247

Protection of our National Parks From Polluters is extremely important to me and many of the people that I know. The parks serve millions of Americans as well as foreign visitors. The Parks are a national treasure and should not be corrupted by careless pollution !!

David Allara

State College, PA, 16803

Progress towards a better future. Enough with the one step forward two steps back routine!

Heath Beaver

Lyons, CO, 80540

Produce electricity without polluting our air. This is important.

Kenny Driver

Indianapolis, IN, 46254

Pollution mitigation should be a standard cost of doing business, especially for energy producers. Passing those costs on to taxpayers should not be an option.

Lisa Mills

Minneapolis, MN, 55405

Pollution is not just "annoying" in the parks because it obscures long-range vision. Particles in pollution are breathed in by animals and humans, and eventually settle on land and plants and water, and poison all those things. It's invasive and wrong and deadly. Please do the right thing, what your agency was created to do: protect all life from the poisonous and deadly effects of pollution from all sources. Doing this will also help calm down the now-runaway and deadly heat increases which kill not only humans, but wildlife, plants, trees, and soil life. Come on, you know what needs to be done. Stand up and do it well -- and that means protection for life, not enabling big-pocket polluters and their cronies.

Maryse Sagewynd

Eastsound, WA, 98245

Pollution is bad, harmful anywhere, but especially where this country has put land aside from development to protect a special place for it's beauty and for all people to get out of cities and into that special place. These special places also include history and places for wildlife to have safety. They provide an education of how this world came to be.

Carlene Steel

Leander, TX, 78641

Pollution cuts from the Hunter and Huntington coal plants is basic to alleviating haze pollution still uncontrolled for nitrous oxides.

Linda Rawlings

Frederick, MD, 21701

Pollution and greenhouse gasses are a big problem for all of us They don't stay within the location of the plant and affect air quality and climate change. If these plants are not using the best available pollution reductions, it's the EPA's job to hold them accountable.

Janice Pardoe

Berkeley, CA, 94705

Pollution and Fossil Fuels go hand in hand

Patrice Aronson

Garrettsville, OH, 44231

Pollution = Climate Crisis

Rebecca Wacklor

Central Point, OR, 97502

Polluting businesses of any kind do not belong on our public lands and most especially do not belong in our National Parks. Let's stop this from happening. It is beyond the time to look for alternatives to polluting industries.

Thank you.

Janice Graef

Granite Bay, CA, 95746

Polluters should be imprisoned.

Shelley Coss

Arlington, VA, 22204

Polluters have to be held accountable or they will continue to pollute with impunity. This is obvious. As coal is the worst pollution source in terms of greenhouse gas emissions, it is most important to hold these coal companies accountable for the social and environmental costs of their product. I urge you to do all possible to enforce the Clean Air Act and all it's provisions.

Sharon Nolting

New York, NY, 10003

Polluted air affects everyone?s health and well being. We all deserve clean air. Please make companies accountable for their pollution!

Brenda & Mark Mehos

Boulder, CO, 80303

Please we need to protect our National Parks

Charlene Spencer

Marietta, OH, 45750

Please use your powerful position and mandate in the service of all the citizens to provide for clean air, clean water, clean environments.

We count on you to close the loopholes, waivers, and extensions to polluters.

Please apply the strongest enforcement you can to our environmental laws to close down polluting elements.

Patricia Gracian

San Diego, CA, 92117

Please stop the mass pollution and enforce necessary regulations .

Joan Gillen

Ocean City, NJ, 8226

Please stop pollution in our national parks. They are a treasure that future generations should have the chance to enjoy! Thank you.

Pamela Chase

Lebanon, OR, 97355

Please stand firm on protecting the parks! These are jewels that belong to all of us. We have to take hard actions to save our natural resources.

Kimberly Scott

Nashville, TN, 37209

Please save our natural areas from pollution. These green spaces are vital to our national and individual mental health.

Judy Ball

Schaumburg, IL, 60193

Please reverse things to harm our planet. There is not going to be a planet for our children!

JoAnn Hart

Taylorsville, UT, 84129

Please reverse the harms created by the prior administration in this area: we need to ensure that the worst polluters are closely regulated so that emissions decline and so air quality is improved throughout the US and the world.

Supporter Unknown

RICHMOND, VA, 23233

Please remember that you are the protector of the environment, not the protector of polluters.

Peter Hall

Camano Island, WA, 98282

Please put the regulations back to the 2018 rules. In particular, please apply the rules to the Prairie State power stations in Illinois. This is the worst polluter in Illinois and the 7th(?) worst in the entire country. Illinois is going to allow the generator to stay online until 2045. That is much too long. You can use your authority to shut t down earlier.

Richard Stuckey

Chicago, IL, 60614

Please protect these special places from more destruction from fossil fuel development. It is a dying lindustry!

Kristin Hunt

Ivins, UT, 84738

Please protect the last of our sacred spaces!!

Madeleine Sears

Salt Lake City, UT, 84105

Please protect our public lands!

Jake Lloyd

Seattle, WA, 98115

Please protect our national parks and resources from greedy polluting companies!

Anthony Bond

New Bern, NC, 28562

Please protect our children's health.

Betty Brooks

Hailey, ID, 83333

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please protect air and water for our communities.

James Keeley

Vancouver, WA, 98662

Please PROECT our National Parks and any other government-owned lands from power plant air pollution and/or OTHER forms of pollution. For that matter, protect the "entire" country from 'this type', and any other type, of pollution. Period!!

David Scheer

Bellingham, WA, 98225

Please make coal and natural gas companies clean iOS their air pollution. Also do not allow private equity firms or hedge funds to reopen shuttered or keep open dirty coal plants.

Lisa Zimmerman

Nassau, NY, 12123

Please keep our air clean for our kids and their kids to enjoy.

Kim Weddington

Salt Lake City, UT, 84123

Please hold these large companies responsible for the tremendous pollution they are causing. Our health and children's health depends on it!!!

Jeanne and Lyndon Jackson

Onalaska, WI, 54650

Please help turn around the greenhouse effect and save our future.

Ethel Eitel

Indianapolis, IN, 46227

Please help make clean air something corporations are help accountable for. Humans and other living beings in this country need to breath.

Allison Arnold

Brooklyn, NY, 11215

Please help insure a future for our children.

Katrina Thurman

Philadelphia, PA, 19147

Please help improve our air quality.

Paulette Schindele

San Marcos, CA, 92069

Please help get this earth back on board to be a better place for ourselves and our future.!

Kimberly Keslin

Forest Park, IL, 60130

Please enforce the best available controls on the West?s most polluting coal plants!

These parks belong to every person in the US. Don?t let irresponsible corporations continue to pollute ruining them for everyone.

Stephanie Toohey

Corvallis, OR, 97339

Please enforce more stringent rules for the polluting coal plants. Our lives depend on it. Our planet is dying and people are getting sick due to our dirty air.

Joann Jessee

West Chester, OH, 45069

Please enforce control over polluting coal plants!

Eric Tauer

Salida, CO, 81201

Please do whatever you can to help protect our beautiful parks!

MARY LOU ZEIS

Hamburg, NY, 14075

Please do the right thing for our environment and our children and grandchildren. Thank you!

Pam Rethy

Saint Louis, MO, 63129

Please do the right thing for our children?s future!

Melanie Holbeck

Cottonwood heights, UT, 84121

Please do the right thing and what's best for our environment and it's citizens by holding coal plants accountable. Our future health depends on it.

Elizabeth Wheelan

Dallas, TX, 75206

Please do something for the people and the land in this nation. We are watching.

Brian Longley

Grants Pass, OR, 97526

Please do not allow our national parks to be continually affected by not enforcing clear air laws on polluters.

Thomas Deetz

Watsonville, CA, 95076

Please don't let anyone destroy the beauty of our national parks by leading their garbage behind,

Leon Johnson

West Valley City, UT, 84119

Please do all you can to protect the earth from climate change and pollution for my children and grandchildren.

Susan Schulman

Hinesburg, VT, 5461

Please do all that is possible for the good of ALL, plant & animal, living on this marvelous earth of ours. Pollution by the United States has an effect on the rest of the earth. Rather than saying it will not do any good if other countries do not do it as well, let us show by our actions the good that it does good. We can not control the actions of others but we can do what is right and good for all.

Sister Clare Ann Litteken

Saint Louis, MO, 63118

Please clean up these dirty coal plants. They have been polluting the land, water and harming the health of the people who leave near them for too long.

Linda Oestry Richardson

Glen Carbon, IL, 62034

PLEASE clean up our air, especially trageting coal power plants. We need higher standards for this deadly pollution. We need a clean energy policy that isustainable for poeple's lives and those of their children.

Lucia Maxwell

Tallahassee, FL, 32309

Please, please reverse the damage done by the previous administration! Please do the right thing by enforcing the best possible controls on the West?s worst polluting coal plants! Thank you.

Pamela Skilling

Ormond Beach, FL, 32174

Please, please regulate polluting coal plants. These operations need to be strictly controlled. Thank you.

Joaninha Joaninha

Oakland, CA, 94602

People should be able to enjoy national parks and not have to worry about catching terrible illnesses from pollution due to unregulated coal plants and other fossil fuel facilities. This is also a racial justice issue because these facilities are built in communities where people of color live more often then in white communities,mmaking people of color several times more likely to develop negative health problems like cancer, asthma, developmental disabilities,, causing them to have weaker immune system?s and making them way more likely to get sick and die from COVID-19.

Sydney Pitcher

Lemon Grove, CA, 91945

Parks must be protected from those who don?t know and don?t care .

Carol Berler

Laredo, TX, 78044

Parks are for tourism. Protect our greater economy by improving the air at parks by addressing coal pollution.

Erin B Perlow

Walnut Creek, CA, 94598

Parks & Forests are important for respiration, ?? Carbon Cycle. Maintenance is extremely important because of rising temperature, sparks fire ? thus increase more carbon dioxide

Cost twice the amount to repair, moreover, it takes more time, no production, decline economy, stagnation. Rajwantee Robinson Seatac thanks ??

Rajwantee Robinson

Seatac, WA, 98188

Outdated and UNNECESSARY ..... stop coddling polluters !

G Clemson

Las Vegas, NV, 89166

Our visit to Lake Powell was the most dramatic night sky I have ever experienced. What a shame that the smokestacks of coal-burning generators still are part of the vista.

You should seize this opportunity to preserve the beauty of Utah and improve the health of its residents by improving all pollution upgrades rather than relaxing them.

We expect the EPA to be a leader in the Protection of our fragile Environment.

Richard Schwerin

El Dorado Hills, CA, 95762

Our planet is at risk due to decades of inaction. Do the right thing for all of us and future generations. It behooves us to require pollution cuts.

Steve Szymanski

Milwaukee, WI, 53207

Our planet, our ONLY planet must be protected from pollution if we are to continue to exist as a species ! Bit by bit, slowly but surely these coal plants are doing us in.

Jean Prebis

Evanston, IL, 60202

Our parks need protected for posterity

Suzanne Ruckman

Yakima, WA, 98901

Our Parks are scared lands.....ANYTHING POLLUCTING needs to STOP!!

Jan E. Vaughan

Seguin, TX, 78155

Our parks are generally the only really wild places in tbe lower 48. They are for ALL the people!!! They belong to the people. Therefore they MUST be protected

.

Kristine Hutchin

Eagle River, AK, 99577

Our open skies in the West are a natural treasure (and crucial to our human health as polluted air kills and sickens large numbers of people, young and old, every year). Please keep those views, and those lungs, clear.

Kimber Nelson

Portland, OR, 97206

Our national parks should be free from pollution especially from a source as dirty as a coal plant. People expect to breathe fresh air in the West. In a park at least, that should be true.

Linda Morgan

San Pablo, CA, 94806

Our national parks are vital places of beauty and nature, and I want my family's children to enjoy them. As you know, Trump's Environmental Protection Agency (EPA) allowed some of the West's largest polluters to avoid Clean Air Act rules. Please hold these companies accountable for their unchecked air pollution, cleaning up the air we breathe and clearing up the views at our national parks. I want the animals, insects and plants in every national park to survive and thrive, and for everyone who wishes to, to enjoy visiting the national parks. Please save them from this threat.

Michelle R

Riverside, CA, 92505

Our national parks are very important for all to enjoy and must be protected from polluters.

Karen Desmond

East Rochester, NY, 14445

Our National parks are part of our greatness. The ability to spend time in nature is a must and the ecosystems within the parks are important for the health of our environment.

Shannon Robichaud

Fort Collins, CO, 80525

Our National Parks are our national treasure and should be preserved at all costs!

Cynthia Tutsch

Yakima, WA, 98902

Our National Parks are a treasure and need to be protected for us and all generations to come!!

Shoshana Serxner-Merchant

Raleigh, NC, 27607

Our National Parks are a treasure and a wonderful place to commune with nature. We need to make sure they are protected from polluters so everyone can enjoy them for years to come.

Samantha Smith

Napa, CA, 94558

Our national parks are a treasure, not just for our enjoyment but for the good of the planet. We need to do everything we can to preserve the earth for our children.

Liz Baker

Mentone, AL, 35984

Our National Parks are a part of our legacy as Americans, resulting from immense foresight in protecting our most unique landscapes. We must protect them - these places of natural beauty must not be open to those who would pollute them.

Elizabeth Milliken

Saint Helena, CA, 94574

Our National Parks are a National TREASURE. People come from all over the world to visit our national parks. To help attract tourists (and generate revenue!) We must take care of them to protect these treasures for future generations. Polluting our national parks with coal mines and haze is a travesty!

Barbara Ginther

Saline, MI, 48176

Our national parks are a gift that should be our priority to keep pristine for generations beyond our own. Coal is one of the biggest contributors to climate change. If we have to use it, it should be tightly regulated.

Reva Shepard

SLC, UT, 84116

OUR HOUSE IS BURNING DOWN!!! STOP THE INSANITY!!!

Janet Swihart

Long Beach, WA, 98631

Our children and grandchildren are exposed to pollution and climate change.

Bruce Krawisz

Marshfield, WI, 54449

Our children's and grandchildren's future is at risk. We must drastically cut CO2 emissions as soon as possible.

Cynthia Flaherty

Columbus, OH, 43221

Oregon has already lost so much from wildfires that have been happening over the hot summer weather over the years. We can't afford to lose anymore, especially from our National Parks. The animals and people who live near those areas won't survive.

Garth Parham

Eugene, OR, 97401

Only when the Last tree has been cut down, the last fish been caught, and the last stream poisoned, will we realize we cannot eat money.

It is an all-hands-on deck moment.

We must stop the destruction of the only planet in our solar system that can support human life.

There is on Planet "B".

Act now before it is too late.

We could be on the eve of destruction, if we don?t act now.

Bruce Burns

San Diego, CA, 92108

On Christmas Eve decades ago, my great grandfather waded in toxic waste that 'broke loose' from Olin Matheson's 'muck dam' located in Saltville, VA. He was helping people nearest the dam evacuate. His legs were horribly disfigured, and he was plagued by recurrent memories of the terror his neighbors and friends experienced. Olin and US Gypsum used unsound mining to rape this rural area, taking its natural resources and leaving behind vast , unpredictable cave-ins that forced people to abandon life-long homes; necessitated the closing and rerouting of country roads; and resulted in traumatic experiences.

A friend of mine since childhood was an accomplished horse woman. While riding on her family's property, a sudden cave-in claimed her favorite horse. She survived only because she was able to roll off the horse before the chasm swallowed it. I have no faith that power producers and corporate giants will do the right thing without sound oversight by a robust EPA.

Jo Chenell

Monee, IL, 60449

Once upon a time, this was known as Common Sense

Les Hudelson

Cedar City, UT, 84721

Once our parks have been polluted, they will be poisoned for future generations. Allowing any pollution in our national heritage parks is irresponsible, immoral and damaging to our standing in the world.

Stephen Condit

Everett, WA, 98208

Now more than ever, with climate change and wildfires, we need to take all the steps possible to limit pollution.

CASSIDY BOULAN

Philadelphia, PA, 19107

Now is the time to take steps to ensure the long-term viability of our planet. We need to protect what few healthy resources remain. The National Parks belong to the People, not to industries or businesses, certainly not to those who pollute our lands and waters.

Nancy Shaw

Cabin John, MD, 20818

Now is the critical moment to join with nations world-=wide to eliminate coal plants that

are destroying our environment and contributing heavily to global warming! The US needs

To lead by example!

Judith Ryan

Seattle, WA, 98104

Now's our opportunity to right a wrong done by the former fossil fuel controlled administration.

Carol Nicholson

Alachua, FL, 32615

NOW! NOW! NOW!

dc katten

Cave Creek, AZ, 85331

NOT ONLY is this horrible for the environment, but as a young woman I dated a guy whose father worked in West Virginia coal mines. He had black lung disease... HE was a mere shell of himself. he looked osteoporotic but probably from inactivity because anything made it difficult for him to breathe. His color was awful, skin darkly stained it appeared and his activity level was mostly concerned about getting to the couch from out of bed. What happens with oil spills, they contaminate the environment, our water, seas, WE NEED to keep what is underground... UNDERGROUND... many of these chemicals are toxic to our world and ourselves.

Makes me sad to see what we do to our planet, despite being dependent on it for water, air and good soil for food.

AS an old rock and roll song goes... YOU'VE GOT to CHANGE your EVIL WAYS.... we need to stop what we are doing to ourselves and our home planet.

Barbara Wos Elledge

Valley, WA, 99181

None of us ever mattered to trump, nor did protecting the environment! We must start to protect people and our ONE planet

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Maryanne Tobin

Philadelphia, PA, 19128

None of us are isolated from the effects of climate change. We need to take it seriously and do more. We are running out of time!

Arlene C. Van Craeynest

Novato, CA, 94947

No more pollution

Barbara Medici

Jefferson Township, PA, 18436

No more excuses!!

Protect all of Nature's wonders or you're fired!

Billy Angus

Hamilton, MT, 59840

No more. Stop pollution now. Enforce existing laws. Give maximum fines to companies that continue to transgress. The EPA needs to step up the game.

Ana Lois-Borzi

Saint Paul, MN, 55102

Nature is so nurturing to the human spirit, please take action to hold these coal plants accountable so that we may still enjoy the bit of nature we have left.

Aurea Cintra

Rochester, NY, 14616

National treasures should be protected by the agencies created to do so, not put on the auction block for predatory capitalism

Judy Therriault

Pownal, VT, 5261

National Parks are treasures, each a one-of-a-kind. All of them need maximum pollution protection to preserve the parks and the visitors.

Donald Winn

Portland, OR, 97213

National Parks are the treasure of our country. It is incredibly sad to allow them to contribute to the demise of our beautiful planet.

Ronda Stevens

Omaha, NE, 68135

National parks are for all of us to ENJOY, not for polluters to damage and destroy!!!

Lea Gina White

West Hartford, CT, 6110

National parks are a treasure for us an Americans and I want the lands to be protected for my son and daughter. Especially with the pandemic, National Parks are being visited even more because they provide outdoor leisure and rejuvenation. So, we need to protect them more since people are enjoying them more

Amanda Ingrassia

Fairfield, CT, 6825

National parks are a place of healing for humans, animals and plants. Help keep them clean by reducing air and climate pollution by going after the major polluters!!!

winifred hopkins

Fullerton, CA, 92833

National Parks and Pollution don't belong in the same sentence together.

It is essential for people to have a place to retreat to and renew. Fresh air and clean water should be synonymous with National Parks.

There is SO MUCH pollution that people are expected to live with every day. Keep pollution, and those who would pollute, out of our National Parks, unless they want to enjoy the clean air, the clean water, and untainted nature with the rest of us.

Susan Smith

Marcola, OR, 97454

National Parks! America?s Best Idea! Need our protection?

Mary McGaughey

Gresham, OR, 97030

My kids & I live in an area of the nation with some of the dirtiest, worst air quality-Southern IN. Help me, my kids and all Americans live in an area where asthma is not the norm and folks are not in danger of shortened lives from air pollution that can be avoided.

Heather Swinney

New Albany, IN, 47150

My granddaughter and great granddaughter have life-threatening asthma.

Bonnie Madre

Poquoson, VA, 23662

My county has a coal firing plant and theres a mega dumpsite right next to the plant which is next to our great lakes when the wind blows a certian way and your in a boat you can smell the off gas the byproducts produce I'd like to know that these two plants have the best updated versions of a filtering system to collect airpollunts so they dont travel in the air over children's schools and hospitals we all know that the byproducts can carry arsenic in a higher level...lest do better for our future children..many blessings and safety for you today.

Michelle Wheeler

Lockport, NY, 14094

My brother-in-law works for the EPA, so I know there are good people there trying to do the right thing! Under the previous president, the EPA was severely limited. Now we want you to roar back and do your job! Thanks for your tireless efforts to protect us and the environment we depend on.

Jo-Anne Harris

Columbus, OH, 43202

My biggest fear for the future is how we are damaging our earth and climate. My biggest hope is that we can addresss this problem and my children can live in a healthful, clean and comfortable world. We have to end coal use right now!!!

Deborah Konkel

Eau Claire, WI, 54701

Maybe have a look see in Joe Manchin?s back yard as well.

Jeffrey Bean

Haddonfield, NJ, 8033

Make Utah's Skies Clean Again

WILLIAM INGALLS

VERNAL, UT, 84078

Make industry do their share.

Juliann Bratcher

Ocala, FL, 34482

Looking at our world there are still areas pretty but none untouched from human distribution by many steps and especially through air pollution. It is up to the government to implement tar reaching air pollution restrictions, the near little human is weak and not doing enough without pressure. Please act for the planet.

Christina Ohlrogge

Norfolk, VA, 23505

Living in the East, I get all the pollution produced by industries all across the country because of the prevailing winds. I don't like it and you can fix it!

David Snope

Califon, NJ, 7830

LETTING SOME OF THE BIGGEST POLLUTERS OFF THE HOOK LIKE THE PAST PRESIDENT DID IS NOT ACCEPTABLE. PLEASE BE BOLD AND MAKE THEM ACCOUNTABLE

Lynn Smith

Capistrano Beach, CA, 92624

Lets move into the future with cleaner energy. Our energy demands are ever increasing. Technology can provide cleaner solutions. Increasing old carbon based energy solutions will choke the life out of us and the planet.

Melvin Herlin

Laguna Niguel, CA, 92677

Let's get this done while we can. PLEASE act as fast as you can!

Brenda Olivares

Palm Desert, CA, 92211

Let's get back to zero (pre 2016) and then move forward!

Jen Packheiser

Oak Park, IL, 60304

Let's do better than China

Natalie Rook

Columbia, MD, 21044

Leaving the world a better place, that is everyone's mission in this life. Especially so for you, in this position. Make your job more about Protecting the Environment, please.

Marian Roh

Port Townsend, WA, 98368

Leave our national parks alone! Is there no limit to the greed of corporate robber barons concerned only with their short-term financial game?

Margaret G Tyler, Ph.D.

Saint Louis, MO, 63122

Keeping our air clean also kerosene our water and land clean.

It matters now and in the future.

We shouldn't need to debate preservation of clean air, water and land.

Please require Hunter and Huntington to reduce its coal pollution emissions which will protect nature, food and water we depend on and the air we breath

Diane Weidenhamer

Waynesville, OH, 45068

Keep improving!

Brad Miller

Anthony, KS, 67003

I'm an avid kayaker and outdoorsman. I spend a lot of money in small towns where nature is still pristine. But the rivers are drying up. Let?s save them for our children by cutting out coal burning and mining!

John Cole

Ashland, OR, 97520

I write to you as a proud resident of the Western United States to ask you to please move forward to require pollution cuts from the Hunter and Huntington coal plants, two of the largest sources of haze pollution still uncontrolled for nitrous oxides.

Anne Gardner

Fort Worth, TX, 76107

I would like to leave a healthy planet for all generations of humans, by protecting our National parks from corporate polluters.

Elisa Plauche

Haiku, HI, 96708

I worked in Glacier National Park as a college student and I now support the GGNRA in the Bay Area of California. I have visited many of the other parks in the Western US. Please do away with the horrible roll-back of over sight of the worst polluters near public lands, including BLM lands and national parks and monuments. We, as a nation, have done a wonderful thing to preserve open space. Now we need to be make sure that the air and water in these beautiful spots are not contaminated. Once contaminated, air and water near these national treasures will be hard to clean up. I very much support strict environmental regulation of all national lands. I want to leave something for the future as well as put an end to short-term profiteering by private corporations and super wealthy people. THANK YOU!

Susan Bryan

Menlo Park, CA, 94025

I was an inspector and the companies with the worst problems were usually located nearest the poorest section of towns. We need to have strong laws against polluters.

Judy Palfrey

Dadeville, AL, 36853

I want to breathe clean air.

Geralyn Leannah

Sheboygan, WI, 53081

I want to breath clean air and I want my children and grandchildren to be able to breathe CLEAN air.

Brenda Olivares

Palm Desert, CA, 92211

I want our national parks to be pristine, not cut up by roads, bulldozers, fracking scaffolding and fracking fluid evaporation pits. Our national parks are not beautiful after they've been raped by industry.

Alice Stehle

Butler, PA, 16001

I want our children and grandchildren to inherit an Earth that is inhabitable. Every bit of positive action counts!

Chris Paterson

Taftsville, VT, 5073

I want my grandchildren to have cleaner and healthier air and not be in the position of making these changes that need to be made today to achieve better air quality.

David Ruhlow

Milford, CT, 6460

I want my generation and future generations to be able to enjoy the earth, breathe fresh and clean air, and experience nature in a positive way and not just through natural disasters. I want us all to be able to see the animals that exist today, not only read about them because they've gone extinct.. The natural world is beautiful and vital to our existence and you have the opportunity and responsibility to do everything you can to protect it, and to protect all of us.

Michelle Strasberg

Brooklyn, NY, 11203

I want every part of this planet protected.

Sue Nuccio

Syracuse, NY, 13206

I want clear air to breathe so my children can have children and still breathe!

Jessica Servi Ortiz

West Allis, WI, 53214

I want clean air, people deserve clean air. Animals deserve clean air.

Maryann Piccione

New Port Richey, FL, 34653

I want clean air, clean water and clean soil!

Cynthia Rea

Herndon, VA, 20170

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i want clean air

Jim Richardson

Raleigh, NC, 27606

I visited several western parks with my family when I was a child. The amazing parks and animals made a huge impression on me. I never want to see harm done to them by ignorant, greedy people.

Marjorie Cutler

Ashland, MA, 1721

I urge you to protect air quality in national parks, to safeguard the air we breathe and protect the environment.

Sam Butler

Los Angeles, CA, 90045

I urge you to encourage renewable energy. NO to any more support for Climate Changing industries.

Sue DeVall

Castle Valley, UT, 84532

I urge you to do all in your power to make those who pollute our air to curb the release of toxins.

Sara Roderer

Heathsville, VA, 22473

It?s way past time to stop polluting. And hold the polluters accountable. We all should be demanding clean air and clean water. Not profits of people and the common good.

Nicholas White

Salt Lake City, UT, 84108

It?s time to stop killing the air, water and brings on earth. Step up! Be part of the solution. To be blunt without getting this done you will be part of a team that helped kill those you love and those you care about. You are smart enough to help figure this out now. Why not help figure out the technology using science which creates solutions and makes room for profit. I?d bet you are clever enough and smart enough to figure out how to do this. No, it won?t be easy. But, why not use your energy in a way that is creative and nurtures rather than destroying?

Jean Perkins

Old Saybrook, CT, 6475

It?d be wonderful if there is a climate in the future. We?re deeply trying to destroy the only place we have. WHAT IS WRONG WITH THE REPUBLICANS?? Don?t they have grandchildren or do they just hate everyone?

Ms Mitzi Harder

Sunriver, OR, 97707

Its time to restore the balance between nature and our carbon footprint. We must erase our mistakes and keep protections in place to defend our nations treasures from the assault of pollution. The time to act is now with urgency greater more than ever before.

Carlos Landabazo

Phoenix, AZ, 85017

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its imperative that we save the environment. now not later! in fact we are sorely way behind. my grandkids are not going to be able to breathe pretty soon. people will be walking around with gas masks!!!!!!!!instead of corona masks. also w. Virginia coal is going to be pushed out --thankfully! say goodbye joe manchin!

Jane Hyden

Detroit, MI, 48224

It should be a no-brainer to wean ourselves off this all-around deadly fossil fuel,

Irmgard Conley

Olga, WA, 98279

It seems the battles for clean air are never finished. I joined a campaign called ? Beyond coal?about fifteen years ago. We have made some progress. But the struggle continues. Instead of one step forward and one step back

let us make it two steps forward

while we can!

Rosalind Hoover

Palm Springs, CA, 92262

It matters to me because I want my grandchildren to be able to enjoy this beautiful planet.

Martha Goodwin

Merced, CA, 95340

It matters because my grandchildren deserve a clean environment. Future generations will face their own unique challenges so I want them to not have to deal with the mess my generation helped create.

Donna Hawley

Springfield, MO, 65807

It is vital that we protect our Natiinal Parks from mining and drilling. It is easier to prevent damage than to try to repair it.

Clean energy is our future not polluting energy.

Please protect our national lands, clean up our air, our water and our lands.

Beverly Blake

salt lake city, UT, 84115

It is urgent that standards set forth by the EPA are enforced. Please insure that the American people receive the best available controls for the worst polluting coal plants in the West by consistently enforcing these standards set by the EPA.

Carmen Coleman

Sonora, CA, 95370

It is time to get serious about the climate issues and passing on a world that is clean and habitable. The parks are the people?s not to be raped. They are areas set aside and protected.

Nancy Sowdon

Corvallis, OR, 97330

It is past the best time to act but if we are to have a planet to call home, we must act & do all we can for our home

Peggy Cooley

South Lake Tahoe, CA, 96150

It is past the best time to act but if we are to have a planet to call home, we must act & do all we can for our home

Peggy Cooley

South Lake Tahoe, CA, 96150

It is important to keep the parks clean and safe for wildlife and people. Our country has so many spectacular lands. We cannot continue to abuse them!

Tena Rohr

SLC, UT, 84105

It is beyond time to do this work!

Cornelia Marsh

Plattsburgh, NY, 12901

I think it has been proven that air pollution has a direct impact on the world we live it. Please

reinstate the restrictions that require the Hunter and the Huntington coal plants to follow.

Thank you!

Karen Kennedy

Lombard, IL, 60148

It doesn't matter where we start. What matters is that we limit and then reverse the fatal effects of fossil fuel consumption on this planet. We can?t expect the industry to self-regulate, so it comes down to limiting and reducing pollution, especially as it impacts our national treasures, which are parks, not profits, by the way. Thanks!

Albert R Matheny

Gainesville, FL, 32605

It's unconscionable to have the solution to so much of Utah's decades-long problems with air quality be undermined by federal inaction. This is not a complex issue. Take away a major source of pollution and the air quality will improve, for the benefit of Utahans' health and the state's robust recreation economy. The federal government is the steward of the five national parks whose airsheds are measurably deteriorated by emissions from the Hunter and Huntington plants. It's also has oversight for enforcing provisions of the Clean Air Act that are meant to protect human health and places such as Zion, Arches, Canyonlands, Bryce Canyon and Capitol Reef. It should be an easy decision to land on the side of science and not let industry pressure compromise these responsibilities. Do the right thing by enforcing the EPA's science-based 2016 ruling and reject the Trump Administration's irrational decision to overturn it.

Eric Frankowski

Longmont, CO, 80503

It's time we started taking better care of our planet -- before it's too late.

Felix Felde

Sisters, OR, 97759

It's time to make drastic changes in how we produce energy, in favor of non -polluting forms.

This is one small step on that path.

Nina Shephard

La Crosse, WI, 54601

It's time to end the destruction of our blue planet and the ecosystem on which we depend for our survival. We need to stop punching holes in the liferaft. Riches to the few at everyone else's expense needs to end!

Roger Underhill

San Francisco, CA, 94132

It's time to clean up the air again after Trump decided to pollute it. Thank you for ?oing your part!

Craig Mackie

Camp Sherman, OR, 97730

It's our moral obligation to protect our national parks and monuments for our children and grandchildren, and for clean air for all who live around them.

Julie Martinson

Everett, WA, 98201

It's high time we ended our dependence on fossil fuels, especially coal.

Deborah Sheinman

Colorado Springs, CO, 80907

It's high time to close harmful coal plants for the safety of our planet and those who live on it. We need clean energy sources to survive. Change for the better before it's too late!

Lynn Lessard

Las Vegas, NV, 89123

It's bad enough the parks have to endue human recreational abuse, pollution from wildfire smoke, acid rain and climate change disasters.

Allowing power plants to ELIMINATE the need for modern pollution controls is a disaster.

Please take action to put strict controls on these plants before it's too late.

Carol Robertson

Kalispell, MT, 59901

It's amazing how hunters and fishermen spend lots of money on their past time bot don't care about the environment they just care about more power!!

Haskell Crow

Jacksonville, AR, 72076

It's a matter of bad air not just a hazy view at Canyonlands, which I've seen more than once.

It's the Federal Clean Air Act and it should cover Federal land.

Roger Green

North Waterford, ME, 4267

In Oregon, our regional haze plan required The Most Stringent controls on our state's coal-fire power plant to reduce their haze impacts. EPA should accept nothing less from other states. Make Utah clean up their dirty power plants. Don't allow Utah to skate on regional haze. Don't allow them to continue polluting their state and their neighboring states.

David Collier

Portland, OR, 97212

I no longer live in California but my beloved siblings, nieces, nephews, and many friends still live there so the quality of life for people in California is extremely important to me. I just learned that one of my nieces was unable to reach her mile run requirements for 8th grade. The truly tragic thing is that she cannot even BE outside most of the time because the air is just too unhealthy and she has asthma. When I lived in California I also had exercise induced asthma. California is so populated that we must find ways to keep it livable for as long as possible. Everything we can do to reduce pollution is essential!!! Thank you for all you do to keep our environment healthy and livable for all life!

Elizabeth Olsson-Mackowski

Concord, MA, 1742

I love the outdoors and our National Parks -- PLEASE PROTECT THEM!!!!!

Laura A Napoli

North Hollywood, CA, 91601

I love the National Parks! They are the best idea ever!

Susanne Ketner

Middletown, VA, 22645

I love the Earth?..

Scott Gibson

Saint Albans, WV, 25177

I live on the West Coast and firmly believe that companies need to be held accountable for their pollutants. Please restore with the Trump administration destroyed.

Rebecca Phillips

Santa Barbara, CA, 93101

I live on the east coast but our family live in the beautiful Colorado mountains. I care about my children's health and the future of the world that they?ll live in. I don?t have the power that you do to make it happen!

Irene Komor

Ithaca, NY, 14850

I live in West Texas, a few hours drive to four national parks. Our air and these parks is frequently polluted by air from the states largest coal based electric company near Dallas and Fort Worth. This company has refused to to upgrade its anti-solution devices. The Texas State commision on environmental quality has not acted. It is time for the EPA to get involved.

Gary Freeman

Fort Davis, TX, 79734

I live in the West, and have marveled at the beauty of this part of our diverse nation.

The wild and open spaces are vital to my survival as a person.

Dorothy Wiseman

Arvada, CO, 80004

I live in the pacific northwest which is blessed to have hydroelectric power and solar power for energy. Coal extraction from the Earth is a forever damage to our environment . To complicate the damage, the dangerous air pollution from burning coal IS HARMFUL TO ALL LIFE on the planet, everywhere! If coal plants cannot be shut down, then let's do the best next method and regulate and control/reduce coal burning plants. NOW and not later. Thank you for reading my personal words to you.

Sue Toy

Bellingham, WA, 98226

I live in the mid west and have enjoyed my trips to the west. I have friends who live there. The wind patterns usually go from west to east. We must protect everyone's air quality.

Kathy Engert

Wilmette, IL, 60091

I live in Michigan. I suffer from both asthma and COPD. Although I live on Lake Michigan and should be breathing clean air, the fact is that we get air directly from the West. The California fires are affecting out air here. We have learned that our air is not much cleaner than Chicago's, even when California isn't burning. This much be coming from places such as the Hunter and Huntington coal plants.

Gail Trill

Williamsburg, MI, 49690

I live in Kentucky but visit Western states as much as I can. We need to keep air in the West as clean as possible for future generations!

Bill Bowman

Louisville, KY, 40205

I live in Illinois where the governor has just approved the closure of a coal fired plant and supports new infrastructure. With the harmful effects shown in the communities closest to the site, I want other individuals throughout the United States to have the same ability to enjoy the outdoors and not suffer irreversible health consequences due to a factor they are unable to directly control.

Sarah Ryerson

Batavia, IL, 60510

I like to breathe clean air. Kids suffering from greater rates of lung problems.

John Mayeux

Luray, VA, 22835

I know from personal experience the devastating effect this pollution has on the health of people in Utah. It is unbelievable that in this day and age, when the poisonous effects of these emissions are well

known, and scientifically documented, that coal plants such as Hunter and Huntington should be permitted to avoid installing the equipment that would significantly reduce this danger to human health, and the health and balance of the natural environment. Respiratory diseases and conditions are unusually prevalent in Utah, especially among children who should not be presenting with such conditions, and it has been proven that in a large percentage of cases the pollution is either the cause, or the reason for poor recovery rates. This pollution not only affects those who live in Utah, but also the health and enjoyment of the thousands of tourists who visit Utah each year.

Vanessa Cato

Ogden, UT, 84404

I just had a baby this summer. He was born 2lbs, and has been in the NICU for 11weeks so far.

After talking to several doctors, I have come to understand that dirty air causes inflammation of the placenta, and severe pregnancy complications. I believe a strong contributing factor to his premature birth was the amount of haze and particulates in the air for the days leading up to the pre-term labor.

The cost of unclean air is very high, and is hurting everyone.

Josh Powell

Bluffdale, UT, 84065

I hope you and your loved ones are well.

Wesley Chuang

Los Angeles, CA, 90024

I have three grandchildren who deserve and are entitle to the cleanest, best earth we can give them. We must show them and the world that we are better than the Trump administration. Please act now!

Leslie Hayes

Williams, AZ, 86046

I have nieces and nephews that deserve clean air! Stop the pollution from coal! Now, before it?s too late!

Aimee Dominique

Lafayette, LA, 70503

I have lived in Utah my whole life. I am 44 and have watched Utah's air become thicker and thicker every year. Why live in such a beautiful place if you can't even see it through the air? We often have the WORST air quality in the world! That's insane! I guess I'm starting to loose faith in what I think American stands for which is leading. We no longer lead we only follow. Please change my view of American politics. I want our government to work for us, if not then what are you doing?!?

Liz Gawel

Midvale, UT, 84047

I have hiked and biked in many of the national parks and state parks in Utah. It is my favorite state and we need to protect the wilderness, protect the health of the environment in these beautiful places. We should be moving towards renewable energy, not allowing dirty coal power plants to continue to pollute.

Deanna Errico

Canton, NY, 13617

I have grandchildren. I want them to grow up in an environment that is healthy and diversified.

Larry Price

Russellville, AR, 72802

I have Grandchildren. Do you? We must care about their futures and no harm can come from being cleaner on Earth. Grave harm will result from increasing pollution!

Dorethea Simone

Camas, WA, 98607

I have empathy for the future generations. Leaving the earth as an habitable planet is the right thing to do.

Brian Sharp

Sausalito, CA, 94965

I have COPD and live on the line of Detroit. I know the air is killing me and the school children I see playing in the school yard. It might be too late for me but not for those children. Clean up our air. Stop climate change. Stop the West's most polluting plants.

Linda Holsapple

Grosse Pointe Farms, MI, 48236

I have asthma. My father and grandfather both worked in coal mines and had black lung. This affects me personally. More importantly, I don't want future generations to have to write letters like I am writing now in order to lead a healthier life. I think you get my point.

Sandra Walker

Salem, VA, 24153

I have asthma. Get it together.

Leslie Lewis

McCloud, CA, 96057

I have adult onset asthma. Air quality is important for everyone.

Wendy Schneider

Madison, WI, 53714

If you do not do something to curb polluting coal plants , there will not be air to breathe or an safe environment for all living creatures to survive in. Once we go beyond a point there will be no turning back; it will be too late. Do something now and take a stance against polluters.

Tanya Piker

La Junta, CO, 81050

If you've been to any of these national parks then you know how amazing they are, how very precious. And they, like so many places, are under attack by pollution. Please do the right thing, for yourself, for your families, and for all living things. The technology to reduce emissions exists.

Stephanie Yesner

Jamaica Plain, MA, 2130

If we don?t take care of our planet now it will be too late???

Terri Rose

Central Point, OR, 97502

If we do not take serious action NOW, we will suffer increased consequences from unnecessary pollution! Please do your part. Thank you.

Marsha Kite

Mount Pleasant, SC, 29464

If we do not eliminate the use of coal, our climate ill warm so much that we will not be able to live in the whole southern tier of the United States. WE MUST STOP EMITTING CO2 into the air! I want my children and grandchildren to be able to live in comfort, and raise their families as we all did in the last century and the beginning of this one.

Martha Booz

El Sobrante, CA, 94803

If we're going to continue using coal, it needs to be as clean as possible. More regulation is needed.

Marshall Hill-Tanquist

Corvallis, OR, 97330

I feel anxious every day about what the future holds, and I feel so powerless to stop the harm that's being done to the environment.

Sophia Jenkins

New York, NY, 10003

I enjoy fond memories of traveling in Utah and visiting the beautiful, unique National Parks and vistas of red rock canyons. I have backpacked down and up canyons and canoed the Green River. When traveling to family members in Idaho, we always plan days to spend in Utah. Sadly, our fossil fuel economy that we and most of the world have embraced is destroying the environment and wreaking havoc on the atmosphere with huge consequences to the sustainability of ecosystems and biodiversity and our survivability. As a new grandmother I am worried about my granddaughter?s future. As a retired biology teacher I am worried for all life on earth. We can and must do better. That starts with strong leadership from our federal agencies .

Janet Gilbert

Crescent City, CA, 95531

I demand immediate action for the EPA and government to reinstate -and increase- controls on all coal plants.

Nicky Ridgeway

Saint Louis, MO, 63110

I care about the effects of Climate Change on children, plants, and animals.

Roy Yamamoto

Chicago, IL, 60660

I can?t believe I even need to send an email about this! Save the planet now, it?s our home and it?s dying!

Melissa Anglin

Verona, WI, 53593

I can't believe a company like Rocky Mountain Power, which touts its green energy investments and connection to its local customer, is knowingly polluting the crown jewel of the state of its most polluting power plants. As a Utah resident I love the National Parks and I hate to see a company willfully destroying these marvels of nature. Let it be known that while I might see the more visible ramifications of its actions, Rocky Mountain Power, and its parent company Pacificorp, are damaging the environment in all of the West and, in the long run all of the country and planet. This needs to be stopped now.

Sebastian Sanchez

West Valley City, UT, 84103

I believe everyone has a right to clean Air. It will also be better for the environment.

Keith Rhinehart

Santa Clara, CA, 95050

I am writing of my grandchildren, who deserve to breathe clean air in our national Parks. Please think carefully before you allow any industry or polluters to further this "dirty" air that continues to be allowed to surround our beautiful parks

Judy Buchholz

McMinnville, OR, 97128

I am now a climate scientist or any kind of a scientist but I believe in science and in 'facts'. So I read/study what the experts say/recommend, and then as a mother and grandmother and someone who cares about the health of all those living on this 'one' planet earth, I am writing to you today to ask/urge/beg you to reinstate the plan for Hunter and Huntington power plants that you adopted in 2016. Please override the 2020 plan/rules, which is totally inadequate!!!

Rivko Knox

Phoenix, AZ, 85053

I am dismayed that exquisite natural wonders are being obscured by preventable pollution. Please take action to correct this.

Pauline Feltner

Detroit, MI, 48207

I am concerned about the inevitable rising rates of asthma and pulmonary disease on the East Coast if the Clean Air Act is not implemented in the manner it was written in. No more exceptions or excuses. We need to take better care of our country and planet or we will all suffer the consequences. Please do the right thing.

Jennifer Heuchert-Mason

New Britain, CT, 6051

I am a retired seasonal Park Ranger with the National Park

Service. I worked 15 Seasons. It is sad to see our National Parks and Monuments being threatened by greedy commercial enterprises. We need to save all of the natural areas we can, not only for the sake of our grandchildren but even more importantly to save our planet.

John Bruce

Redmond, OR, 97756

I am a retired physician in Utah. I am writing to support action to keep the West's national parks free of air pollution.

Christopher Hall

Ogden, UT, 84403

I am a proud "former" resident of Colorado. And know that it is necessary to clean up these coal fired plants during this Administration's terms.

Laurie Pearson

Mooresville, NC, 28117

I am a physician and I'm tired of seeing my patients suffering from asthma, lung cancer, and poor respiratory function- whether they smoke or not. I am tired of seeing big businesses burn fossil fuels and contribute to global warming while normal people lose their homes and business to the consequences: storms, floods, fires, etc. Help me keep our people safe and healthy.

Heather Sharkey

Brunswick, ME, 4011

I am a Pacific Power customer and support phasing these plants in Utah out !!

Michael Schulte

Portland, OR, 97212

I am an avid park goer and want to see places that are protected from corporate polluters. Our public lands are the heritage we leave for future generations . We should treat them with respect.

Lizbeth Giletto

New York, NY, 10036

I am an advocate for humanity and the planet. We need each other to survive. I want my children and their children to be able to enjoy it and thrive. We all need clean air to survive and thrive together.

Megan Vaughn

Baldwinsville, NY, 13027

I am a concerned citizen and I believe that my home deserves clean air. There is so much beauty and it is being destroyed by these polluters. I have had the privilege to grow up and enjoy this beautiful home, my kids and grandkids deserve the same opportunity. It is our responsibility it protect our home. Please help protect my home from these awful polluters

Samantha Pensari

Draper, UT, 84020

I agree with the following statement: "Trump's Environmental Protection Agency (EPA) allowed some of the West's largest polluters to avoid Clean Air Act rules. Now Biden's EPA has a chance to hold these companies accountable for their unchecked air pollution, cleaning up the air we breathe and clearing up the views at our national parks."

S. Neimark

Silver Spring, MD, 20904

I've lived in Utah most of life, now over sixty-five years. I can't recall those very early times as a child when I'd look up and see clearly the mountains around Salt Lake and bright stars at night. I do remember, however, camping as a child and being able to see forever, going to the National Parks in our state and those surrounding, being in the forests and the clarity of our air, and I remember over the years how that's changed. Now, as I hike the trails near my home or travel to our public lands, the haze is ever present, a constant cloud of pollution that we live with, that we see, that we breathe. Pacific Power was held accountable in 2016 and they were forced to install equipment to reduce the pollution pouring from their stacks then in 2020 the Trump administration gave them a free ticket to remove those same pieces of equipment that were cleaning our air. Please stand and require the pollution controls be reinstalled.

Tom Laabs-Johnson

Sandy, UT, 84093

I'm sick of paying more in health care premiums to fund treatment of respiratory diseases that can easily be prevented by implementing more protective air quality standards.

Jeff Schimpff

Madison, WI, 53705

I'm sending the message below as a citizen who does not live near eithe of the particular coal-fired plants discussed therein, but as a concerned citizen upon whom the pollution of other such plants fouls the air I breath.

Robert Stevenson

Lebanon, PA, 17042

I'm a hiker that lives in Utah so I frequent our State and National Park. The down grading that we experienced thru the Trump Administration of our National Park/Land need to be reversed.

george rawson

Draper, UT, 84020

However, you MUST do MUCH more. We MUST keep ALL climate-changing fossil fuels IN THE GROUND! We MUST achieve 100% clean, renewable energy by 2030.

Art Hanson

Lansing, MI, 48917

However, you MUST do MUCH more. We MUST keep ALL climate-changing fossil fuels IN THE GROUND! We MUST achieve 100% clean, renewable energy by 2030.

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Art Hanson

Lansing, MI, 48917

How can we still be allowing, for a150+ years, coal/fossil fuel to be burned without ensuring it is safe? It needs to end.

Kevin Oldham

Ballston Spa, NY, 12020

Hold polluters responsible for making the air we breathe unhealthy

John Dunn

Vashon, WA, 98070

Haze in the air affects public health as well as enjoyment of our otherwise beautiful environment. Please regulate these polluters to improve life for all of us, especially those living closest to these polluting power plants

Bari Levinson

Reno, NV, 89519

Having traveled throughout Utah several times, I am aware of the pollution caused by the high sulfur coal plants. Utah has the ability to provide clean solar and wind energy generation for its citizens because of its weather patterns. Enforcement of best practices must be done, as voluntary pollution control has not been achieved.

Amy Scott

Dunmore, WV, 24934

Growing up in a large city during a period when coal was king, myself and other children in our neighborhood were plagued with asthma due to the soot and filth in the air. Our porches needed to be swept daily, interior furniture dusted constantly, rugs washed on a regular basis and the walls cleaned at least once a year. It was so bad that birds often fell from the air. It was disgusting. Do we really want to go back to this? Do we want to expose children to these toxic particles once again? I guess an answer will depend on how heavily pockets will be lined by industry.

Linda Rossin

Lake Hopatcong, NJ, 7849

Greedy developers and people need to be controlled.

Joanne Pannone

Robbinsville, NJ, 8691

Goodbye Forever ????

William Foreman

Warren, OH, 44484

God gave us this earth out of his love and I love wildlife rivers mountains lakes trees glaciers all animals ????we need to protect our blessings

Elisa Griffith

Pottstown, PA, 19464

Give your children and grandchildren a world with clean air!

Fanny Whitman

Westport Pt, MA, 2791

From both a moral and economic standpoint, cutting emissions will mitigate suffering from asthma and other lung and heart conditions caused by particulate matter in the air as well as reduce the cost of public health care

Susane Boukamel

Cary, NC, 27511

Fossil fuels are ruining our planet and there is no time left for dallying. We must do the hard but responsible work now and switch to a sustainable energy to protect the water, air, wildlife, and natural resources. I beg you to do whatever you possibly can, so my five beautiful grandchildren can enjoy a safe and fulfilling future in a beautiful world.

Vicki Voros

Salt Lake City, UT, 84117

Fossil fuels are a relic of the past, and they are the most virulent of the relics. Countless people have been sickened and killed by their use, refinement, transport, and storage. Coal is one of the most egregious, if not the most egregious, offender. The sooner that it is phased out completely the safer and the more healthy we will all be.

Samuel H. Clarke

Corvallis, OR, 97330

Fossil fuel must pay its way in all respects. When it?s as clean as possible, renewable energy will be far more cost effective.

Irene and Stephen Bachhuber

Portland, OR, 97202

For the sustainability of our human future we humans must stop burning fossil fuels!

Tom Earnist

San Pedro, CA, 90731

For the health of all Americans, we must rid ourselves of coal.

Peg Albrets

Cupertino, CA, 95014

For the future of all our children and their children to enjoy the National Parks as we have!

Mary Lopez

Citrus Heights, CA, 95610

Face it: we are almost too late to stop the catastrophic end-game of climate crisis that has largely been fueled by coal plants. It's past time for regulators in the EPA to find your moral compasses and take the high road to end fossil fuel pollution. Corporate interests will not try to find new ways for power generation until they take seriously the end of fossil fuel use.

Nancy Galland

Rockland, ME, 4841

Everything Trump did was horrible. Reverse anything you can.

Albert Kaufman

Portland, OR, 97212

Everything alive needs clean air.

Joan Saxton

Sausalito, CA, 94965

Every polluter who is harming U.S. (and global) residents and jeopardizing the health and well-being of thousands or millions, young and old, needs to be brought to heel and penalized for their callous disregard for public health in further pursuit if their own profits. Any remaining U.S. coal plants must be phased out swiftly with NO compensation. Please pass Carbon Fee and Dividend legislation quickly and place a high price on carbon emissions immediately. It is not too early to act decisively and for the public and future good!

Hope Salzer

Piedmont, CA, 94611

Every person, every organization, ever company should be healed responsible and accountable for their decisions and actions?I know I?ve been responsible for my actions.

There is no good reason companies should not be held accountable!

Dale Lund

Eagan, MN, 55122

Everyone has the right to clean air. It?s time to stop these big polluters

Sue Habecker

Lebanon, PA, 17042

Everyone deserves to breathe clean air, even the precious animals.

Supporter Unknown

Madera, CA, 93637

Every living thing needs clean air in order to live healthy lives. Polluted air harms everything.

Janice Jones

El Cerrito, CA, 94530

Everyday that goes by our environment is continually polluted by these polluters. I am one of those who is affected by this due to respiratory problems.

Alicia Saldivar

Stephenville, TX, 76401

EPA stands for one of the most important arms of our government, ENVIRONMENTAL PROTECTION AGENCY. It is vital that you do your utmost to protect the quality of the air we breathe by enforcing modern pollution controls on Utah's coal plants.

Irma Riley

Gainesville, FL, 32605

EPA = CO-OPERATES WITH SPECIAL INTERESTS..!!! WHEN DO YOU PEOPLE START DOING SOME POSITIVE WORK TO SAVE OUR DYING PLANET....?????!!!! STOP POLLUTING COAL PLANTS NOW...!!!!! EPA HAS BECOME IMPOTENT AGENCY ; TALKS BIG WITH SMALL RESULTS...!!! PATHETIC...!!!!!!!!!!!!!!!!!!!!!!

John Prybylski

Buffalo, NY, 14227

EPA, I know you endured much hardship under the Trump administration. But you have perplexingly been slow to reverse his destructive legacy in our National Parks. Is this a result of incompetence or of insincerity? You appear to have fallen prey to some version of the Stockholm syndrome, but it needs to stop now. Our survival is at stake.

Harold Ross

Brooklyn, NY, 11230

Environmental protection means just that! Have we eradicated all the traitors trump put in to completely kill the EPA? Start there-and abolish every thing-every last bit-ph their cruelty and intentional destruction of forests, clean air.

Then put teeth in all the laws we have: mandatory jail terms, heavy penalties-enough to re-forest the millions of acres lost on the west coast. I mean make polluters pay so much it?s not feasible to continue paying nothing fines for denuding forests, open strip mining, polluting leased government lands.

I mean it- coal and gas fines in the billions. They are poor listeners, but money talks!

Linda Nelssen

Eden Prairie, MN, 55344

Enough of pollution,we must act now.

Martin Sheehan

Cape Canaveral, FL, 32920

End pollution so we can have cleaner air and enjoy public spaces fully.

Ronald Schoedel

Evanston, WY, 82930

End coal pollution of the atmosphere! We need to breathe free of coal smoke in the air.

Edward Johnson

Indianapolis, IN, 46228

Emissions from non renewable energy sources are major contributors to many negative aspects of an healthful existence!

William Dawe

Naperville, IL, 60565

Either we render coal as a NON polluter or we totally retire using coal as an energy provider. Retire coal use!

Mary Mcgaughey

Gresham, OR, 97030

E-bikes further reduce habitat available for wildlife.

Marion Klaus

Park City, UT, 84098

Driving past one of these plants, I was astonished at the constant waves of pollution billowing out.

Bret Stockton

Phoenix, AZ, 85020

DO YOUR JOB?ACT!

Kaylene Schultz

Phoenixville, PA, 19460

Do your job and stop harmful pollution. Please protect us who have asthma.

Charlie Weaver

Kalkaska, MI, 49646

Do what's best for our health.

Sam Russo

Brighton, NY, 14620

Do the right thing for our planet. Please.

Kara Cope

SLC, UT, 84106

Do the right thing.

Ann Duck

Wilmette, IL, 60091

Don't give in to their bribes (campaign donations) and greed.

John Butchart

Inlet, NY, 13360

Dirty waste plumes kill people. We don't need the electricity from dirty coal plants.

Robert Andrews

Rochester, MN, 55901

Dirty air is a public health issue - to humans and all other animals

E Candace Berthrong

Providence, UT, 84332

My name is Julia Ho and I am a civil engineering student at the University of Texas at Austin. Through my time learning about infrastructure at UT, it has become clear to me that we live in a world that currently

has the technological capacity to much more aggressively transition to renewable energy. What is holding us back is political inertia and the will of oil and coal companies. Please take the step to introduce renewables and shut down coal plants for the sake of my generation. We live with so much anxiety over the future - please help us craft one that can sustain us in time.

Sincerely,

Julia Ho

Austin, TX, 78705

Corruption is not the answer we must pull together as Americans and rise to the events at hand that can cause the collapse of society. It's apparent that big business has been lining the pockets of EPA officials and Donald j Trump is trying to destroy our planet from greed, this is why we need to make it harder for companies pollute the planet.

Jesse Ridgeway

Bellefonte, PA, 16823

Continue to make a stance by supporting efforts to a greener tomorrow. I want to feel proud of my country as it sets precedence for other world leaders to follow.

Dana Harrison

Saint Augustine, FL, 32080

Companies must be accountable for their unchecked air pollution, cleaning up the air we breathe and clearing up the views at our national parks.

George Phillips

Hendersonville, NC, 28792

Coal use increased during the pandemic. We must reverse course. We must rid ourselves of coal as a source for our needs & convert to green, clean technology.

Keith Koster

Tucson, AZ, 85719

Coal simply must be phased out as a source of energy. To allow coal plants to pollute as we fight to overcome climate change, largely linked to non-green energy dependence, makes no sense at all.

Elona Meyer

Corvallis, OR, 97330

Coal pollution is bad for Utah, but it affects the entire globe. And we have to be desperately trying to reduce this massive carbon footprint, to stave off a disastrous future.

John Hammo

Portland, OR, 97212

Coal plants should not even exist! I'm 68 and we've been talking about clean air and clean water and global warming for fucking ever! Stop the nonsense! Our grandchildren are all going to die terrible deaths and live horrific realities. We can?t even stop that now, but we could make it less bad. Stop the madness!

Sheila Lynch

Newark, DE, 19711

Coal Plants in this country (and around the world for that matter) MUST be eliminated to support resistance of global warming.

Helen Hays

Oregon City, OR, 97045

Coal plants are dirty, unhealthy, unsafe. Coal plants pollute the air and there are cleaner, better and safer energy methods now for our country.

Rose Reina-Rosenbaum

Hillsborough, NJ, 8844

Coal needs to go away so stop the worst of the worst in these damn coal mines NOW!! Before it is too late for our parks and environment. Do it NOW!!!

C. Menn

Columbus, OH, 43214

Coal MUST be phased out--of our national grid: the worst emitter of greenhouse gasses in the sector, these plants only survive by elaborate games of tax incentives and fantasies about "clean" coal. Hold Big Coal accountable for their violations!

Christine Harker

Kirksville, MO, 63501

Coal mining should have stopped 15 years ago in order for the US to meet its climate change goals.

Janis Dufford

Evergreen, CO, 80437

Coal is truly obsolete and only still mined for benefit of coal miners and local politicians.

Can't these miners be trained to work in renewables and less destructive energy resources?

Joan Victor

New York, NY, 10075

Coal is the worst fossil fuel that is being used, and ignoring science is done so at our own peril. Not only is it a major cause of climate change, but it is also in direct violation of our right to breathe clean air. The changes made to put profiteers over the planet & people must be reversed as soon as possible.

Martha Cottle

Chilmark, MA, 2535

Coal is the dirtiest fossil fuel used in the US. It is time to retire all coal fired power plants. Do not replace them with fossil gas power plants! Replacing one fossil fuel with another is just delaying the inevitable. We need to move to renewable energies now.

Janice Brown

Englewood, CO, 80110

Coal is over, outdated and dirty

Clean energy is the way forward

Barb Watts

Louisville, KY, 40204

Coal is one of the worst offenders for our air quality. They need to be accountable and control their emissions.

Nancy Ball

Sioux Falls, SD, 57104

Coal is not the answer. Time to go in a different direction, and until then, let's keep it as clean as possible.

Jennifer Liptow

Farmington, MI, 48336

Coal is not a viable power solution because it causes excessive air pollution relative to other fuels like natural gas and in particular, adds too much CO2 to our atmosphere. Please take care of Mother Earth and enforce air pollution controls on these plants. The rules put in place by the previous administration were too lax to be useful and were giveaways to the power industry. Do the right thing, enforce the best controls on these western coal plants.

Jon Brodziak

Honolulu, HI, 96816

Coal is dead. SHUT IT DOWN. We have better ways. We also have to help Americans who work in these plants to move on to other jobs. Give companies incentives to locate in these areas. Protect our parks and the American people at all costs. ENOUGH IS ENOUGH!!!!!!!

James Morgan

Hampton, NJ, 8827

Coal is a nineteenth century fuel, and all of us are facing climate crisis. Continuing to allow coal pant pollution that affects our national parks is unconscionable. You are in a position to help.

Ann Riddel

Austin, TX, 78767

Coal is a horrendous source of green house gasses and its use should be curtailed.

Cheryl Gerth

Coon Rapids, MN, 55433

Coal is a a dying entity. Stop throwing it lifelines, the world cannot survive with coal pollution driving the extinction crisis that is happening. Oil and gas need to be severely cut back and eventually go the same way as coal. For humanity to survive, this must happen!

Bill Mcnally

Colorado Springs, CO, 80904

Coal contains mercury, a non-biodegradable element that does not break down in people's systems and can cause nerve damage. With many green energy options, why are we

even considering dirty coal?

Jo-Ann Sramek

Hermantown, MN, 55811

Coal ash and smoke has killed enough people in this country. Jobs created by clean energy companies would be safer and pay just as much as being a coal miner . Joe Manchin is not concerned about your health or climate change. Do something about it before the whole country is uninhabitable.

Donald Talley

Memphis, TN, 38111

Coal and other fossil fuels need to remain in the ground.

Nancy Crumpacker

Portland, OR, 97210

Coal air pollution from the West highly impacts the environment in the East. We are told not to eat more than one wild-caught ,fresh-water fish meal a month because of the heavy metals in the fish that have accumulated from air pollution that rain has added to the lakes and streams. Acid rain is another issue, which harms trees. Particulate matter that everyone breathes in causes lung diseases. This all needs to be corrected.

Robin Walkup

New London, NH, 3257

Climate catastrophe is here. The EPA must do all it can to prevent further irreversible climate damage NOW!

Heather Cantino

Athens, OH, 45701

Clear air is a right that needs to be protected.

Oron Bass

High Springs, FL, 32643

Clean up the Earth! Stop coal plants!

Patricia Halderman

Lincoln, NE, 68506

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cleaner parks = healthier parks

H Fast

Cincinnati, OH, 45230

Clean energy and clean air!

Barb Bittenbinder

Central, SC, 29630

Clean breathable air should matter to all of us!

Joan McGonigal

Minneapolis, MN, 55443

Clean breathable air is a basic right and no one or no corporation has the right to pollute it, especially now when there are other alternatives.

David Scharf

Los Angeles, CA, 90039

Clean air smells good. Air is alive if air is dead I will die. Being stuck in traffic or being outside the exhaust smells bad hard breath.

Ryan Rosenthal

Boca Raton, FL, 33487

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clean air should matter to all !!!!!

Diane Marchisio

Woodbury, CT, 6798

Clean air now!

Brian Reed

Canton Center, CT, 6020

Clean air matters.

Julie Sheehan

Midway, UT, 84049

Clean air is vital to the health of people and the planet. Please ensure that coal plants are held to the EPA?s clean air standards. They should not get a pass!

Candace Allison

Atlanta, GA, 30329

Clean air is very important and something we all take for granted. Companies need to be held accountable for polluting our air.

Maria Almaraz

Alamo, TX, 78516

Clean air is important for human & environmental health!

Ashley Wintle

Roy, UT, 84067

Clean air is essential to all life forms. We must prioritize that over corporate profits!

Jody Isenberg

San Bernardino, CA, 92404

Clean air is basic to our survival. Use this opportunity to investigate, identify and regulate our dirty coal industry. We have a window for change NOW - please do not let it close!

Monica Shaw

Long Beach Township, NJ, 8008

Clean air is absolutely essential.

Gary Overby

Sister Bay, WI, 54234

Clean air is a basic human right and must be protected by our government.

Amy Minato

Portland, OR, 97219

Childhood asthma is on the rise.

Mary Beck

Fort Collins, CO, 80521

Businesses that knowingly pollute the planet should be stopped, and penalized for their actions. Enough!

Gary Faley

Flint, MI, 48532

Burning technologies for producing energy are not working for us anymore. It's time to invest in solar, wind, and geothermal energy.

Requiring higher standards for coal fired plants just speeds up the newer investments in non burning energy plants.

Thanks for your help in this.

Alice Williams

Georgetown, SC, 29440

Breathing matters

Breathing clean air matters

Controlling releases of pollutants and poisons matters

M. A, Gahos

Gulfport, FL, 33707

Breathing is worth fighting for

susan holden

Phoenix, AZ, 85032

Breathing clean air is important to me and my family. The increase in allergies that we are all experiencing has a pollution cause.

Pat Fling

Saint Petersburg, FL, 33702

Breathing clean air is a human right and that includes your right. Pollution causing industries need to be regulated and held accountable because that pollution is going nowhere on this planet except in our lungs!

Aimee Shinhearl

Mentor, OH, 44060

Breathe baby breathe breathe MaMa breathe breathe Papa breathe breath easy friends breathe breathe world breathe

Renae Nichols

Gresham, OR, 97030

Brazil claims to "protect" 30% of its land from degradation due to converting rainforest to

clearing, burning, cattle ranching, road construction, water diversion and other activities that accelerate species extinction. The wealthy nations must do much better.

Protect animal migration routes with safer corridors for for caribou, lynx, wolves, cougars,

marine mammals, bison, weasels, bears and numerous other Land animals.

Let' do better than Brazil.

Greg Freer

McKinleyville, CA, 95519

Bold action is needed. Coal is killing people and the environment.

Kathi Ward

Saint Petersburg, FL, 33704

Big coal, big oil and big energy companies have been subsidized by taxpayers and given pass after pass on cleaning up their act and meeting minimal environmental focused regulation. They must be given hard limits and forced to change to renewable energy production ASAP!

Ryan Dybdahl

Ann Arbor, MI, 48105

Big $ shouldn't rule over protecting our wildlife or our health

Jane Andrews

Oak Hill, FL, 32759

Better yet, shut them all down!!

John Cruickshank

Earlysville, VA, 22936

Because the wild spaces need to be available for people wild life wild plants and remembering the past.....

Cathleen Weston

Hauser, ID, 83854

Because the western National Parks are great national treasures! I have been to most of them and have seen the effects of pollution in some of them. TOTALLY SPOILS THE EXPERIENCE!!!

Rita Heinz

Durham, NC, 27701

Because our entire area was under an air pollution alert caused by fossil fuels this summer more days than not. This is RIDICULOUS@

Diana Abbott

Longmont, CO, 80503

Because it's the right thing to do and we haven?t even come close to reparations or conservation efforts

Diane Cooper

Lebanon, OR, 97355

Because it's wrong to pollute

Michelle VanCromphaut

Roseburg, OR, 97470

Because is enough! Please get over yourselves and corporate greed! Get with it before NONE of your future generations are NOT future!

Christine Redmpnd

Mount Dora, FL, 32757

Because I have a precious 5 year old granddaughter that I pray has a lot of time left to live on this planet.

laurie baldwin

South Daytona, FL, 32119

Because all living things need to

healthy clean air to survive!

Gregory Alexander

Saint Clair Shores, MI, 48081

As someone who has asthma and trouble breathing in the best of air, it is imperative that we keep ALL the air around us as pure and clear as possible!!

Becky Birch

Bothell, WA, 98011

As our climate rapidly deteriorates and our leaders slowly sit by uselessly and watch it happen, the EPA is our only hope. I have grandchildren and I want them to have a livable planet with clean open spaces and fresh life-sustaining air!

Ellen & Sean Honey

Austin, TX, 78732

As I drive down the road with my kids in the car and my windows open, predictably there are noxious fumes coming from Baltimore smoke stacks and black exhaust fumes from Mack trucks. Let?s get back to where we were. Let?s put community health first.

Trudy Conley

Severn, MD, 21144

As a Utah resident, who has seen the impact of coal mining, I strongly believe that it is time time to move from coal to solar!

Thomas Mader

Moab, UT, 84532

As a pastor who works with people who are dying of lung conditions, I know coal is the worst choice for energy. The EPA must do all it can to monitor its use until it is completely stopped.

Holly Hallman

Port Ludlow, WA, 98365

As a native Californian who grew up in the Bay Area in the 80's where one big fire happened once a decade, seeing the devastating impact climate change has had on the frequency and size of fires now is terrifying. I live in a fire zone and every fire season I sleep a little less. Changes made to protect our planet from harmful carbon emissions should be coming from a legislative level. not on the shoulders of the individual to make small changes that don't have the same impact.

Karrie Dies

Oakland, CA, 94611

As an Alaskan who highly values our national parks and has visited and backpacked in many of them, including Katmai, Death Valley, Bryce, Zion, and Grand Canyon, protecting these parks for the future are a high priority.

Maureen Knutsen

Naknek, AK, 99633

As a mom and outdoor enthusiast, I know that clean air and a stable climate are critical to our well-being. Let's enforce the law to protect our planet.

Polly Freeman

Seattle, WA, 98107

As a Master's student in marine science, I study every day the first-hand effects of what this type of legislature could do for our country. No amount of short term profit will be worth the ecosystem services provided by the parks that will be ruined without intervention. Please help protect these amazing places!!

Liz Farquhar

Monroe, NC, 28110

As a geoscientist and retired regulator who dedicated over 30 years of my career to the protection of Texas' environment, I understand and appreciate that politics can sometimes interfere with good science.

It's time for the US to phase out the use of polluting coal plants for our energy supply. In the interim, emissions should be limited using scrubbers and other available technology.

Anne Miller

Austin, TX, 78756

Anything that can be done to improve air and water quality should be done for the good of all living things currently and for the future. Do not give a pass to industries that are jeopardizing our health and climate.

Pamela Datwyler

Spartanburg, SC, 29307

Americans in history have created safe natural areas such as National Parks and Wilderness areas. Those trying to commercialize these places are traitors. We also MUST clean up the air to even begin solving the climate crisis. Reducing carbon based fuels is critical.

Anne Bringloe

Yakima, WA, 98902

Americans demand clean air, and NOT corporate ideology!

Stan Gelb

Longmont, CO, 80501

All pollution needs to be policed and enforcement of anti pollution laws is critical. The future of our planet is at stake and we only have a few years to make a big change.

Rise Siegel

Orange, CT, 6477

All legislation and decisions must prioritize protection of our natural world!

Lura Brookins

Santa Fe, NM, 87501

All coal plants need to be held accountable, especially Hunter and Huntington!!!They need to be required to have modern pollution controls!

Annette Raatz

Chicago, IL, 60618

ALL Americans deserve clean AIR and WATER! Do everything possible to keep people healthy!

Thanks for all your hard work. Julie

Julianna Nader

Sherwood, OR, 97140

Air quality us critical for our health. Coal companies use our air to fire their furnaces but leave it dirty. It is time for them to take responsibility and clean up their act. If you dirty the floor, you clean it up. Amen.

Therese Dowd

Tacoma, WA, 98406

Air quality affects our quality of life, as well as the health of my family. Additionally, pollution contributes to global warming, a real event that has arrived. If we want to continue to enjoy the outdoors, breath fresh air, and prevent global warming, moving to more environmentally friendly sources, which also promote jobs, is essential.

I vote in every election and I fully support candidates that vote to protect our environment.

Thank you,

Traci Rudfelt

El Dorado Hills, CA, 95762

Air pollution still needs to be regulated now more then ever. Even though Trump scrapped the pre existing regulations the EPA needs to get back to protecting these conservation areas. Air polluting industries need to be phased out all together anyways if we want to have a fighting chance at preserving the normalcy of this earth.

Brandon Wheelock

Vista, CA, 92081

Air pollution is every human's problem: greenhouse gas emissions are reducing the livability of the climate for all children alive today and all future generations; toxic emissions like mercury and heavy metals are damaging to the health of millions of people who live near coal-fired power plants. Cleaning up these emissions should not be delayed any longer!

William Schoene

Santa Monica, CA, 90405

Air pollution adds billions of dollars to health costs, shortens lives and stunts brain development in children. Fossil fuels are over! STOP POISONING OUR PLANET!!!!!

Victoria Szatkowski

Westbrook, ME, 4092

A healthy environment benefits EVERYONE!

Douglas Kaplan

Glenview, IL, 60026

After 42 years at EPA much of it focused on utility industry enforcement I know how critical emission reductions from this sector are to public health and welfare protection. Please make this a top priority for the Agency.

David Schulz

Downers Grove, IL, 60516

Actually, it's high time to stop all coal extraction and burning entirely. Any remaining coal plants should be planning for this future without them right now!

William Forrest

Rochester, NY, 14608

A clean environment free from pollution, especially from coal-fired electrical plants. Lets go green with wind and solar power. This is our future. Get it done.

Jimmy Dunn

Fairhope, AL, 36532

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50 years ago our air was breathable. We've made progress but here in TN we still have air pollution issues like acid rain in the Smokies. We need to do more.

Gwendolyn Blanton

Kingston Springs, TN, 37082

YOU MUST PROTECT OUR BEAUTIFUL NATIONAL PARKS FROM POLLUTERS WHO DESTROY THEM!!! IT'S JUST COMMON SENSE FOR GOD'S SAKE. THESE PARKS WERE SET UP FOR THE PUBLIC TO ENJOY, IS YOUR CONSCIENCE IN YOUR POCKET???????

THANK YOU FOR PROTECTING OUR NATIONAL PARKS.

Izabela Wnuk

Itasca, IL, 60143

6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 63

[EPA–HQ–OAR–2020-0148; FRL-7527-02-OAR]

RIN 2060-AU67

National Emission Standards for Hazardous Air Pollutants: Refractory Products Manufacturing Residual Risk and Technology Review

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This action finalizes the residual risk and technology review (RTR) conducted for the Refractory Products Manufacturing source category regulated under national emission standards for hazardous air pollutants (NESHAP). The Environmental Protection Agency (EPA) found the risks due to emissions of air toxics from this source category to be acceptable and that the standards provide an ample margin of safety to protect public health. As a result, the Agency is making no revisions to the emission limits for this source category based on the residual risk. In our technology review, after reviewing developments in practices, processes, and control technologies, the EPA determined that no revisions to the numeric emission limits is necessary. However, the EPA is revising certain work practice provisions based on the technology review. These final amendments also include new provisions for certain hazardous air pollutants (HAP) and a revision of the alternative fuel provisions. In addition, the Agency is taking final action on the proposed amendments for the source category to address emissions during periods of startup, shutdown, and malfunction (SSM); emissions during periods of scheduled maintenance;

electronic reporting of notification of compliance status (NOCS) reports, performance test results, and performance evaluation results; the addition of test methods and guidance materials; updates to several test methods; and other miscellaneous clarifying and technical corrections.

DATES: This final rule is effective on **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The incorporation by reference (IBR) of certain publications listed in the rule is approved by the Director of the *Federal Register* as of **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: The U.S. Environmental Protection Agency (EPA) has established a docket for this action under Docket ID No. EPA-HQ-OAR-2020-0148. All documents in the docket are listed on the *https://www.regulations.gov/* website. Although listed, some information is not publicly available, *e.g.*, Confidential Business Information or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through *https://www.regulations.gov/*, or in hard copy at the EPA Docket Center, WJC West Building, Room Number 3334, 1301 Constitution Ave., NW, Washington, DC. The Public Reading Room hours of operation are 8:30 a.m. to 4:30 p.m. Eastern Standard Time (EST), Monday through Friday. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the EPA Docket Center is (202) 566-1742.

FOR FURTHER INFORMATION CONTACT: For questions about this final action, contact Ms. Paula Deselich Hirtz, Minerals and Manufacturing Group, Sector Policies and Programs Division (D243-04), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919)

541–2618; fax number: (919) 541-4991; and email address: *hirtz.paula@epa.gov*. For specific information regarding the risk modeling methodology, contact Mr. Chris Sarsony, Health and Environmental Impacts Division (C539-02), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541–4843; fax number: (919) 541–0840; and email address: *sarsony.chris@epa.gov*.

SUPPLEMENTARY INFORMATION:

Preamble acronyms and abbreviations. The Agency uses multiple acronyms and terms in this preamble. While this list may not be exhaustive, to ease the reading of this preamble and for reference purposes, the EPA defines the following terms and acronyms below. Also, throughout this preamble the terms "we," "us," or "our" mean the EPA.

BLD	bag leak detection
CAA	Clean Air Act
CRA	Congressional Review Act
CDX	Central Data Exchange
CEDRI	Compliance and Emissions Data Reporting Interface
EJ	Environmental Justice
EPA	Environmental Protection Agency
ERT	Electronic Reporting Tool
FTIR	Fourier Transform Infrared
HAP	hazardous air pollutants(s)
HQ	hazard quotient
IBR	incorporation by reference
ICR	Information Collection Request
lb/hr	pounds per hour
MACT	maximum achievable control technology
HCl	hydrogen chloride
HF	hydrogen fluoride
Hg	mercury
MIR	maximum individual risk
NAAQS	National Ambient Air Quality Standards
NACWA	National Association of Clean Water Agencies

NEI	National Emission Inventory
NESHAP	national emission standards for hazardous air pollutants
NOCS	notification of compliance status
OM&M	operation, maintenance, and monitoring
OPL	operating parameter limit
PDF	portable document format
PM	Particulate matter
POM	polycyclic organic matter
ppmvd	per million by volume, dry basis
RFA	Regulatory Flexibility Act
RTO	regenerative thermal oxidizer
RTR	risk and technology review
SSI	Sewage Sludge Incinerator
SSM	startup, shutdown, and malfunction
THC	total hydrocarbons
tpy	tons per year
TOSHI	target organ specific hazard index
UMRA	Unfunded Mandates Reform Act
µg/dscm	micrograms per dry standard cubic meter
$\mu g/Nm^3$	micrograms per normal cubic meter
UPL	upper prediction limit
VCS	voluntary consensus standards
VE	visible emissions
XML	extensible markup language

Background information. On January 14, 2021, the EPA proposed revisions to the Refractory Manufacturing Products NESHAP based on our RTR (86 FR 3095, January 14, 2021). In this action, we are finalizing decisions and revisions for the rule. We summarize some of the more significant comments we timely received regarding the proposed rule and provide our responses in this preamble. A summary of all other public comments on the proposal and the EPA's responses to those comments is available in the document titled *Summary of Public Comments and Responses on Proposed Rule*: *National Emission Standards for HAP from Refractory Products Manufacturing (40 CFR part 63, subpart SSSSS) Residual Risk and Technology Review, Final Amendments,* located in Docket ID No. EPA-HQ-OAR-2020-0148. A

"track changes" version of the regulatory language that incorporates the changes in this action is available in the docket.

Organization of this document. The information in this preamble is organized as follows:

I. General Information
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B. What is the Refractory Products Manufacturing source category and how does the NESHAP regulate HAP emissions from the source category?
C. What changes did we propose for the Refractory Products Manufacturing source category in our January 14, 2021 RTR proposal?
III. What is included in this final rule?
A. What are the final rule amendments based on the risk review for the Refractory Products Manufacturing source category?
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C. What are the final rule amendments pursuant to CAA sections 112(d)(2) and (3) for the Refractory Products Manufacturing source category?
D. What are the final rule amendments addressing emissions during periods of startup, shutdown, and malfunction (SSM)?
E. What other changes have been made to the NESHAP?
F. What are the effective and compliance dates of the standards?
IV. What is the rationale for our final decisions and amendments for the Refractory Products Manufacturing source category?
A. Residual Risk Review for the Refractory Products Manufacturing Source Category
B. Technology Review for the Refractory Products Manufacturing Source Category
C. CAA Sections 112(d)(2) and (3) Amendments for the Refractory Products Manufacturing Source Category
D. SSM Amendments for the Refractory Products Manufacturing Source Category
E. Electronic Reporting Amendments for the Refractory Products Manufacturing Source Category
F. Technical Amendments for the Refractory Products Manufacturing Source Category
V. Summary of Cost, Environmental, and Economic Impacts and Additional Analyses Conducted
A. What are the affected facilities?
B. What are the air quality impacts?
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VI. Statutory and Executive Order Reviews
A. Executive Orders 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review
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E. Executive Order 13132: Federalism
F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments
G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks
H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use
I. National Technology Transfer and Advancement Act and 1 CFR Part 51
J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
K. Congressional Review Act (CRA)

I. General Information

A. Does this action apply to me?

Regulated entities. Refractory Products Manufacturing, the source category that is the subject of this final action, is regulated under 40 CFR part 63, subpart SSSSS. The North American Industry Classification System codes for the refractory products industry are 327124 (clay) and 327125 (nonclay). We estimate that three major source facilities engaged in refractory products manufacturing will be affected by this final rule. To determine whether your facility is affected, you should examine the applicability criteria in the appropriate NESHAP. If you have any questions regarding the applicability of any aspect of this NESHAP, please contact the appropriate person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section of this preamble.

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

In addition to being available in the docket, an electronic copy of this final action will also be available on the Internet. Following signature by the EPA Administrator, the EPA will post a copy of this final action at: *https://www.epa.gov/stationary-sources-air-*

pollution/refractory-products-manufacturing-national-emissions-standards. Following publication in the *Federal Register*, the EPA will post the *Federal Register* version and key technical documents at this same website.

Additional information is available on the RTR website at *https://www.epa.gov/stationary-sources-air-pollution/risk-and-technology-review-national-emissions-standards-hazardous*. This information includes an overview of the RTR program and links to project websites for the RTR source categories.

C. Judicial Review and Administrative Reconsideration

Under Clean Air Act (CAA) section 307(b)(1), judicial review of this final action is available only by filing a petition for review in the United States Court of Appeals for the District of Columbia Circuit (the Court) by **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].** Under CAA section 307(b)(2), the requirements established by this final rule may not be challenged separately in any civil or criminal proceedings brought by the EPA to enforce the requirements.

Section 307(d)(7)(B) of the CAA further provides that only an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review. This section also provides a mechanism for the EPA to reconsider the rule if the person raising an objection can demonstrate to the Administrator that it was impracticable to raise such objection within the period for public comment or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule. Any person seeking to make such a demonstration should submit a Petition for Reconsideration to the Office of the Administrator, U.S. EPA, Room 3000, WJC South

Building, 1200 Pennsylvania Ave., NW, Washington, DC 20460, with a copy to both the person(s) listed in the preceding **FOR FURTHER INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), U.S. EPA, 1200 Pennsylvania Ave., NW, Washington, DC 20460.

II. Background

A. What is the statutory authority for this action?

Section 112 of the CAA establishes a two-stage regulatory process to address emissions of HAP from stationary sources. In the first stage, we must identify categories of sources emitting one or more of the HAP listed in CAA section 112(b) and then promulgate technology-based NESHAP for those sources. "Major sources" are those that emit, or have the potential to emit, any single HAP at a rate of 10 tons per year (tpy) or more, or 25 tpy or more of any combination of HAP. For major sources, these standards are commonly referred to as maximum achievable control technology (MACT) standards and must reflect the maximum degree of emission reductions of HAP achievable (after considering cost, energy requirements, and non-air quality health and environmental impacts). In developing MACT standards, CAA section 112(d)(2) directs the EPA to consider the application of measures, processes, methods, systems, or techniques, including, but not limited to, those that reduce the volume of or eliminate HAP emissions through process changes, substitution of materials, or other modifications; enclose systems or processes to eliminate emissions; collect, capture, or treat HAP when released from a process, stack, storage, or fugitive emissions point; are design, equipment, work practice, or operational standards; or any combination of the above.

For these MACT standards, the statute specifies certain minimum stringency requirements, which are referred to as MACT floor requirements, and which may not be based

on cost considerations. See CAA section 112(d)(3). For new sources, the MACT floor cannot be less stringent than the emission control achieved in practice by the best-controlled similar source. The MACT standards for existing sources can be less stringent than floors for new sources, but they cannot be less stringent than the average emission limitation achieved by the best-performing 12 percent of existing sources in the category or subcategory (or the best-performing five sources for categories or subcategories with fewer than 30 sources). In developing MACT standards, we must also consider control options that are more stringent than the floor under CAA section 112(d)(2). We may establish standards more stringent than the floor, based on the consideration of the cost of achieving the emissions reductions, any non-air quality health and environmental impacts, and energy requirements.

In the second stage of the regulatory process, the CAA requires the EPA to undertake two different analyses, which we refer to as the technology review and the residual risk review. Under the technology review, we must review the technology-based standards and revise them "as necessary (taking into account developments in practices, processes, and control technologies)" no less frequently than every 8 years, pursuant to CAA section 112(d)(6). Under the residual risk review, we must evaluate the risk to public health remaining after application of the technology-based standards and revise the standards, if necessary, to provide an ample margin of safety to protect public health or to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect. The residual risk review is required within 8 years after promulgation of the technology-based standards, pursuant to CAA section 112(f). In conducting the residual risk review, if the EPA determines that the current standards provide an ample margin of safety to protect public health, it is not necessary to revise

the MACT standards pursuant to CAA section 112(f).[1] For more information on the statutory authority for this rule, see 86 FR 3097 (January 14, 2021).

B. What is the Refractory Products Manufacturing source category and how does the NESHAP regulate HAP emissions from the source category?

The EPA promulgated the Refractory Products Manufacturing NESHAP on April 16, 2003 (68 FR 18730). The standards are codified at 40 CFR part 63, subpart SSSSS. The Refractory Products Manufacturing industry consists of facilities that manufacture refractory products, such as refractory bricks, refractory shapes, monolithics, kiln furniture, crucibles, and other materials used for lining furnaces and other high temperature process units. The source category covered by this NESHAP includes three major source facilities.

The NESHAP groups refractory product manufacturing processes into four subcategories: clay refractories, nonclay refractories, chromium refractories (nonclay) and pitch-impregnated refractories (nonclay). The three major source facilities manufacture clay and/or nonclay refractory products and can be grouped into the clay and nonclay refractories subcategories. Chromium refractory products and pitch-impregnated refractory products are not manufactured by any of the three major source facilities.

The Refractory Products Manufacturing NESHAP specifies emission limits, operating limits, and work practice standards for existing affected thermal process units and for new and reconstructed affected thermal process units that emit organic HAP according to refractory product type. For existing clay refractory product kilns, the NESHAP requires the use of natural

[1] The Court has affirmed this approach of implementing CAA section 112(f)(2)(A): *NRDC v. EPA*, 529 F.3d 1077, 1083 (D.C. Cir. 2008) ("If EPA determines that the existing technology-based standards provide an 'ample margin of safety,' then the Agency is free to readopt those standards during the residual risk rulemaking.").

gas or equivalent fuel at all times, except during periods of natural gas supply interruption or curtailment, to limit metal HAP, hydrogen fluoride (HF) and hydrogen chloride (HCl) emissions. New clay refractory product kilns are required to meet numeric limits for HF and HCl. For existing and new curing ovens, shape dryers, and kilns that are used to process refractory products that use organic HAP (*i.e.*, nonclay refractory product sources), the NESHAP provides the option of meeting a total hydrocarbon (THC) concentration limit or reducing the THC mass emissions by at least 95 percent. The NESHAP also establishes operating limits for thermal process sources and control devices, which are based on operating parameters established during performance testing. Additional detail on the refractory product manufacturing source category and NESHAP requirements are provided in the proposal preamble (86 FR 3083, January 14, 2021).

C. What changes did we propose for the Refractory Products Manufacturing source category in our January 14, 2021 RTR proposal?

On January 14, 2021, the EPA published a proposed rule in the *Federal Register* for the Refractory Products Manufacturing NESHAP, 40 CFR part 63, subpart SSSSS, that took into consideration the RTR analyses (86 FR 3095). For this source category, we proposed that the risks are acceptable, and that additional emission controls are not necessary to provide an ample margin of safety. For the technology review, we proposed improvements to the existing work practice standard for affected continuous kilns using THC emission control devices. We also proposed the following amendments: standards for previously unregulated HAP for affected sources in the clay and nonclay refractory subcategories; the requirement that NOCS reports, performance test results, and performance evaluation results be electronically submitted;

revisions to the SSM provisions of the rule; new test methods and incorporation by reference (IBR) of alternative test methods; and other minor technical and editorial revisions.

III. What is included in this final rule?

This action finalizes the EPA's determinations pursuant to the RTR provisions of CAA section 112 for the Refractory Products Manufacturing source category and amends the Refractory Products Manufacturing NESHAP based on those determinations. This action also finalizes other changes to the NESHAP, including the proposed changes described above, except we are finalizing a slightly modified version of the proposed work practice standard for affected continuous kilns using THC emission control devices, as explained in section IV.B.2 of this preamble; and we are not finalizing the proposed allowance to use alternative fuels during periods of natural gas supply curtailment or interruption from the natural gas fuel requirement, as explained in section IV.B.3 of this preamble. We are finalizing these requirements as a result of the public comments we received on the proposed rule.

A. What are the final rule amendments based on the risk review for the Refractory Products Manufacturing source category?

This section describes the final amendments to the Refractory Products Manufacturing NESHAP (subpart SSSSS) being promulgated pursuant to CAA section 112(f). In this action, we are finalizing our proposed determination that risks from the Refractory Products Manufacturing source category are acceptable, the standards provide an ample margin of safety to protect public health, and additional standards are not necessary to prevent an adverse environmental effect. The EPA proposed no changes to the subpart based on the risk review conducted pursuant to CAA section 112(f). The EPA received no new data or other information during the comment period that would cause us to change our proposed risk determination. Therefore, we are not

requiring additional controls or new requirements under CAA section 112(f)(2) for subpart SSSSS in this action.

B. What are the final rule amendments based on the technology review for the Refractory Products Manufacturing source category?

We determined that there was a development in practice that warranted revision of the MACT standards for this source category. Therefore, to satisfy the requirements of CAA section 112(d)(6), we proposed revisions to the MACT standards to improve the existing work practice standard for affected continuous kilns using emission control devices. The proposed revisions were based on the best practices of one facility and included:

- limitation of the work practice standard to THC emission control devices only,
- an annual limit on the number of hours for bypass of the control device,
- the requirement to process product containing lower percentages of organic HAP content in the resins, binders and additives (less than the average organic HAP mass fraction),
- an allowance for the processing of five kiln cars per year with greater than average organic HAP mass fraction, and
- reporting of the mass of organic HAP emissions for bypass periods in the semi-annual compliance report.

The EPA received additional data during the comment period that caused us to change these proposed work practice requirements. Therefore, in this action, we are finalizing the following requirements under CAA section 112(d)(6) for subpart SSSSS:

- the proposed limitation of the work practice standard to THC emission control devices only,
- the proposed annual limit on the number of hours for bypass of the control device,

- revised requirement to maintain the organic HAP processing rate below whichever is lower, either a) the average organic HAP processing rate (*i.e.*, the average organic HAP processing rate (pounds per hour (lb/hr)) based on actual production on a 6-month rolling basis, not to include periods of kiln shut down) or b) the lowest hourly organic HAP processing rate determined during the most recent performance test,
- removal of the proposed allowance for processing of five kiln cars per year with greater than average organic HAP mass fraction during control device maintenance and bypass,
- revised reporting requirements for the semi-annual compliance report, including:
    - the average organic HAP processing rate based on actual production on a 6-month rolling basis (not to include periods of kiln shut down) or the lowest hourly organic HAP processing rate from the most recent performance test (whichever is lower), for bypass periods,
    - the actual organic HAP processing rate,
    - the amount of product produced and the mass of organic HAP in the product produced,
    - the estimated THC emissions,
    - the number of hours the control device was bypassed during the compliance period, and
    - the cumulative number of hours the control device was bypassed over the last 12-month rolling period.

We are not finalizing the proposed allowance for processing of five kiln cars per year with greater than average organic HAP mass fraction during control device maintenance and bypass. For more information regarding the final improvements to the work practice standard

that applies for continuous kilns with THC emissions control devices, see section IV.B of this preamble.

In addition, the EPA received a comment during the comment period that caused us to review the fuel combustion technology used by sources in the source category and consequently revise the existing work practice standard to require the use of natural gas (or equivalent fuel) at all times. After consideration of the comment, under CAA section 112(d)(6), we are removing the allowance to use alternative fuels during periods of natural gas supply curtailment or interruption from the natural gas fuel requirement as explained in section IV.B.3 of this preamble. This finalized amendment applies to existing clay refractory products kilns and new or existing chromium refractory products kilns and reflects a development in our understanding of refractory kiln fuel combustion technology since promulgation of the original standard.

Finally, as part of the technology review, we identified regulatory gaps (previously unregulated processes or pollutants) and are establishing new standards to fill those gaps as described in section III.C of this preamble.

C. What are the final rule amendments pursuant to CAA sections 112(d)(2) and (3) for the Refractory Products Manufacturing source category?

We determined that there are previously unregulated HAP for existing sources in the clay and nonclay refractory subcategories that warrant revisions to the MACT standards for this source category. Therefore, pursuant to the requirements of CAA section 112(d)(2) and (3) we proposed revisions to the MACT standards to include the following:

- new emission limits for particulate matter (PM) as a surrogate for non-mercury (non-Hg) metal HAP and mercury (Hg) for existing clay refractory product kilns, and

- the requirement to use natural gas as fuel, or an equivalent fuel, as the kiln fuel for new and existing curing ovens, shape dryers, and kilns that are used to process refractory products that use organic HAP (*i.e.*, nonclay refractory product sources), except during periods of natural gas supply interruption or curtailment.

As noted in section III.B of this preamble, the EPA received a comment during the comment period that caused us to review the fuel combustion technology used for all refractory products sources in the source category. Based on that review, we are not finalizing the proposed allowance to use alternative fuels during periods of natural gas supply interruption or curtailment from the natural gas fuel requirement for new and existing nonclay sources. Therefore, we are finalizing the new emission limits for PM (as a surrogate for non-Hg metal HAP) and Hg for existing clay refractory product kilns, as proposed, and we are finalizing a revised requirement to use natural gas, or an equivalent fuel, as the fuel for new and existing nonclay sources, as a result of comments, under CAA section 112(d)(2) and (3) for subpart SSSSS in this action.

D. What are the final rule amendments addressing emissions during periods of startup, shutdown, and malfunction?

We are finalizing the proposed amendments to the Refractory Products Manufacturing NESHAP to eliminate the SSM exemption. Consistent with *Sierra Club v. EPA*, 551 F. 3d 1019 (D.C. Cir. 2008), the EPA is establishing standards in these rules that apply at all times. As detailed in section IV.E of the proposal preamble (86 FR 3099, January 14, 2021), Table 11 to subpart SSSSS of part 63 (General Provisions applicability table) is being revised to change several references related to the provisions that apply during periods of SSM. We also eliminated or revised certain recordkeeping and reporting requirements related to the eliminated SSM exemption. The EPA also made other harmonizing changes to remove or modify inappropriate,

unnecessary, or redundant language in the absence of the SSM exemption. We determined that facilities in this source category can meet the applicable emission standards at all times, including periods of startup and shutdown. Therefore, the EPA determined that no additional standards are needed to address emissions during these periods. The legal rationale and explanation of the changes for SSM periods are set forth in the proposed rule. See 86 FR 3079, 3099-3102. Further, the EPA did not propose and is not promulgating standards for malfunctions in this final action. As discussed in section IV.E of the January 14, 2021, proposal preamble, 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, although the EPA has the discretion to set standards for malfunctions where feasible. For the Refractory Products Manufacturing source category, it is unlikely that a malfunction would result in a violation of the standards, and no comments or information were submitted during the comment period that support a contrary conclusion. Refer to section IV.E of the January 14, 2021 proposal preamble for further discussion of the EPA's rationale for the decision not to set standards for malfunction events, as well as a discussion of the actions a source could take in the unlikely event that a source fails to comply with the applicable CAA section 112(d) standards as a result of a malfunction event, given that administrative and judicial procedures for addressing exceedances of the standards fully recognize that violations may occur despite good faith efforts to comply.

E. What other changes have been made to the NESHAP?

In addition to the changes described above we are finalizing other proposed amendments for the Refractory Products Manufacturing NESHAP related to electronic reporting, test methods and minor technical and editorial revisions, as described below.

To increase the ease and efficiency of data submittal and data accessibility, we are finalizing the proposed requirement that owners and operators of facilities in the Refractory Products Manufacturing source category submit electronic copies of required NOCS reports, performance test results, and performance evaluation results through the EPA's Central Data Exchange (CDX) web site using an electronic performance test report tool called the Electronic Reporting Tool (ERT). We also are finalizing, as proposed, provisions that allow facility operators the ability to seek extensions for submitting electronic reports for circumstances beyond the control of the facility, *i.e.*, for a possible outage in the CDX or Compliance and Emissions Data Reporting Interface (CEDRI) or for a *force majeure* event in the time just prior to a report's due date, as well as the process to assert such a claim.

We are also finalizing the proposed additional and updated test methods and an EPA guidance document that are incorporated by reference. In accordance with requirements of 1 CFR 51.5, the EPA is incorporating by reference the following documents described in the amendments to 40 CFR 63.14:

- ANSI/ASME PTC 19.10-1981, Flue and Exhaust Gas Analyses [Part 10, Instruments and Apparatus], issued August 31, 1981, IBR approved for Table 4 to subpart SSSSS.
- ASTM D6348-12e1, Standard Test Method for Determination of Gaseous Compounds by Extractive Direct Interface Fourier Transform Infrared (FTIR) Spectroscopy, Approved February 1, 2012, IBR approved for Table 4 to subpart SSSSS.
- ASTM D6784-16, "Standard Test Method for Elemental, Oxidized, Particle-Bound and Total Mercury in Flue Gas Generated from Coal-Fired Stationary Sources (Ontario Hydro Method)," (Approved March 1, 2016), IBR approved for Table 4 to subpart SSSSS.

- EPA-454/R-98-015, Office of Air Quality Planning and Standards (OAQPS), Fabric Filter Bag Leak Detection Guidance, September 1997, IBR approved for 40 CFR 63.9804(f)(1). This document provides guidance on the use of triboelectric monitors as fabric filter bag leak detectors.

In addition, we are finalizing the following proposed technical and editorial corrections:

- Revise 40 CFR 63.9824 and Table 4 to subpart SSSSS of part 63 to clarify the location in 40 CFR part 60 of applicable EPA test methods; and
- Revise 40 CFR 63.9814 and 63.9816 to include the requirements to record and report information on failures to meet the applicable standard.

Finally, although not addressed in the proposal, we are amending 40 CFR 63.9804(e)(1) to correct a spelling error.

F. What are the effective and compliance dates of the standards?

The revisions to the MACT standards for the Refractory Products Manufacturing source category being promulgated in this action are effective on **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. New sources must comply with all of the standards immediately upon the effective date of the standard, **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, or upon startup, whichever is later.

The compliance dates for existing affected sources are listed below. Existing affected sources must continue to meet the current requirements of 40 CFR part 63, subpart SSSSS, until the applicable compliance date.

The compliance date for existing affected nonclay sources to comply with the work practice to use natural gas as fuel, or an equivalent fuel, as the kiln fuel at all times, including periods of natural gas supply interruption or curtailment is **[INSERT DATE OF**

PUBLICATION IN THE FEDERAL REGISTER]. The compliance date for existing affected sources to comply with the electronic reporting requirement for NOCS reports, performance test results, and performance evaluation results is **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The compliance date for existing affected sources with continuous kilns using THC emission control devices to comply with the amended work practice standards (*i.e.*, limit the total number of hours for bypass of the control device for during scheduled maintenance to 750 hours per year per kiln; maintain the organic HAP processing rate below the average rate based on production or below the lowest hourly rate during the most recent performance test, whichever is lower; update the operation, maintenance, and monitoring (OM&M) plan; include the required information in the semi-annual compliance report) is **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The compliance date for existing affected clay refractory product kilns to comply with the new limits for PM (as a surrogate for non-Hg metal HAP) and Hg is **[INSERT DATE 1 YEAR AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The compliance date for existing affected sources to comply with the SSM revisions, in accordance with the SSM court decision, is **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

We determined that an immediate compliance date is practicable for the natural gas requirement and is based on current practices and other information provided by the facilities. We are finalizing the 181-day compliance date for electronic reporting and the scheduled maintenance work practice to require facilities to implement these changes as expeditiously as practicable. For electronic reporting, our experience with similar industries that are required to convert reporting mechanisms to install necessary hardware and software, become familiar with

the process of submitting performance test results electronically through the EPA's CEDRI, test these new electronic submission capabilities, and reliably employ electronic reporting shows that a time period of a minimum of 90 days, and, more typically, 180 days, is generally necessary to successfully accomplish these revisions. For the improved scheduled maintenance work practice, we expect facilities would also need this time to seek approval from the Administrator before taking the control device on the affected kiln out of service for scheduled maintenance and update their operation, maintenance, and monitoring plan to reflect the revised requirements. For the new PM (as a surrogate for non-Hg metal HAP) and Hg requirements, we determined the one-year compliance date would provide existing clay sources with sufficient time to plan and schedule facility resources to meet the notification and compliance demonstration testing requirements associated with the new limits. For the SSM changes, excluding the revised requirements for the SSM described above (40 CFR 63.6(f)(1)), our experience with similar industries further shows that this sort of regulated facility generally requires a time period of 181 days to read and understand the amended rule requirements and make any necessary operational adjustments, adjustments to recordkeeping and reporting systems, and/or updates to OM&M plans to reflect the revised requirements.

During proposal we requested information from sources in this source category regarding specific actions that would need to be undertaken to comply with the proposed amended requirements and the time needed to make the adjustments for compliance with any of the revised requirements. No comments or information were submitted during the comment period that support a contrary conclusion; therefore, we are finalizing these compliance dates as proposed.

IV. What is the rationale for our final decisions and amendments for the Refractory Products Manufacturing source category?

For each issue, this section provides a description of what we proposed and what we are finalizing for the issue, the EPA's rationale for the final decisions and amendments, and a summary of key comments and responses. For all comments not discussed in this preamble, comment summaries and the EPA's responses can be found in the comment summary and response document, *Summary of Public Comments and Responses on Proposed Rule: National Emission Standards for HAP for Refractory Products Manufacturing (40 CFR part 63, subpart SSSSS), Residual Risk and Technology Review, Final Amendments,* available in the docket.

A. Residual Risk Review for the Refractory Products Manufacturing Source Category

1. What did we propose pursuant to CAA section 112(f) for the Refractory Products Manufacturing source category?

Pursuant to CAA section 112(f), the EPA conducted a residual risk review and presented the results of this review, along with our proposed decisions regarding risk acceptability and ample margin of safety, in section IV.B of the proposed rule preamble (86 FR 3095, January 14, 2021). The results of this review are presented briefly below in Table 1 of this preamble. Additional detail is provided in the residual risk technical support document titled, *Residual Risk Assessment for the Refractory Products Manufacturing Source Category in Support of the 2020 Risk and Technology Review Proposed Rule*, which is available in the Refractory Products Manufacturing docket (Docket Item No. EPA-HQ-OAR-2020-0148-0013).

TABLE 1. REFRACTORY PRODUCTS MANUFACTURING SOURCE CATEGORY INHALATION RISK ASSESSMENT RESULTS

Risk Assessment	Maximum Individual Cancer Risk (in 1 million)	Estimated Population at Increased Risk of Cancer ≥ 1-in-1 Million	Estimated Annual Cancer Incidence (cases per year)	Maximum Chronic Noncancer Target Organ Specific Hazard Index (TOSHI)[1]	Maximum Screening Acute Noncancer HQ[2]

	Based on Actual Emissions	Based on Allowable Emissions	Based on Actual Emissions	Based on Allowable Emissions	Based on Actual Emissions	Based on Allowable Emissions	Based on Actual Emissions	Based on Allowable Emissions	Based on Actual Emissions
Source Category	0.7	0.7	0	0	0.0003	0.0003	0.04	0.04	HQREL = 0.09
Whole Facility	0.7	-	0	-	0.0004	-	0.04	-	-

1 The TOSHI is the sum of the chronic noncancer hazard quotients (HQ) for substances that affect the same target organ or organ system.

2 The maximum estimated acute exposure concentration was divided by available short-term threshold values to develop HQ values.

The results of the proposed inhalation risk modeling, as shown in Table 1 of this preamble, indicate that the maximum individual cancer risk based on actual and allowable emissions (lifetime) is 0.7-in-1 million (driven by trace amounts of chromium, arsenic, nickel and cadmium emissions from tunnel kilns), the maximum chronic noncancer TOSHI value based on actual and allowable emissions is 0.04 (driven by HF from tunnel kilns), and the maximum screening acute noncancer HQ value (off-facility site) is 0.09 (driven by HF). At proposal, the total annual cancer incidence (national) from these facilities based on actual and allowable emission levels was estimated to be 0.0003 excess cancer cases per year or one case every 3,333 years. The maximum individual cancer risk (lifetime) for the whole facility was determined to be 0.7-in-1 million at proposal, driven by chromium, arsenic, nickel and cadmium emissions from tunnel kilns. The total estimated cancer incidence from the whole facility was determined to be 0.0004 excess cancer cases per year, or one excess case in every 2,500 years. No people were estimated to have cancer risks above 1-in-1 million from exposure to HAP emitted from both MACT and non-MACT sources at the three facilities in this source category. The maximum facility-wide TOSHI for the source category was estimated to be 0.04, driven by HF emissions from tunnel kilns.

We also evaluated multipathway human health risk from the five PB-HAP that are emitted by sources within this source category (arsenic, cadmium, POM, Hg (divalent Hg and methyl mercury), and lead). We evaluated the cadmium emissions from these facilities and concluded this HAP did not exceed the Tier 1 multipathway screening value of 1 for cancer or noncancer. We also evaluated the arsenic, methyl mercury, and POM emissions and found these HAP caused an exceedance of the Tier 1 multipathway screening value of 1 for cancer. Therefore, we conducted a Tier 2 screening assessment for these HAP and concluded that emissions of arsenic, POM and methyl mercury from these facilities did not exceed the Tier 2 multipathway screening value of 1 for cancer. A Tier 2 noncancer screening assessment was also conducted for Hg emissions and resulted in a screening value less than 1. Based upon the results of the screening assessments no further screening or site-specific assessments were conducted for this source category.

In evaluating the potential for multipathway effects from emissions of lead, modeled maximum annual-average lead concentrations were compared to the National Ambient Air Quality Standards (NAAQS) for lead (0.15 $\mu g/m^3$). Results of this analysis confirmed that the NAAQS for lead would not be exceeded by any facility.

To evaluate the potential for adverse environmental effects, the EPA focuses on eight HAP, which are referred to as "environmental HAP," in its screening assessment: six PB-HAP and two acid gases. The PB-HAP emitted by sources in the category are arsenic compounds, cadmium compounds, POM, mercury (both inorganic mercury and methyl mercury), and lead compounds. The acid gases included in the screening assessment and emitted from the category are HCl and HF. In the Tier 1 screening analysis for PB-HAP (other than lead, which was evaluated differently), arsenic, cadmium, divalent mercury, and POM had no Tier 1 exceedances

for any ecological benchmark. Methyl mercury emissions at one facility had a Tier 1 exceedance for the surface soil no-observed-adverse-effect-level (avian ground insectivores) by a maximum SV of 2. A Tier 2 screening assessment was performed for methyl mercury. Methyl mercury had no Tier 2 exceedances for any ecological benchmark. For lead, we did not estimate any exceedances of the secondary lead NAAQS.

Two acid gases are emitted by sources within this source category: HCl HF. We conducted a screening-level evaluation of the potential adverse environmental effects associated with emissions of HCl and HF and found that the average modeled concentration around each facility (*i.e.,* the average concentration of all off-site data points in the modeling domain) did not exceed any ecological benchmark. In addition, each individual modeled concentration of HCl (*i.e.,* each off-site data point in the modeling domain) was below the ecological benchmarks for all facilities. For HF, the maximum facility screening value (based on the average concentration of all off-site data points over the modeling domain) was well below 1 (0.007) and the maximum area that exceeded the ecological benchmark was only 0.002-percent of the modeled area. Based on the results of the environmental risk screening evaluation, we do not expect an adverse environmental effect as a result of HAP emissions from this source category.

We weighed all health risk factors, including those shown in Table 1 of this preamble, in our risk acceptability determination and proposed that the residual risks from the Refractory Products Manufacturing source category are acceptable (section IV.C of the proposed rule preamble, 86 FR 3095, January 14, 2021). We then considered whether 40 CFR part 63, subpart SSSSS provides an ample margin of safety to protect public health and prevents, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect. At proposal we determined there are no individuals in the exposed population with lifetime

cancer risks above 1-in-1 million as a result of actual or allowable emissions from this category. In addition, in our risk analysis we did not identify a potential for adverse chronic noncancer, acute noncancer, or multipathway health effects. Therefore, we proposed the current standards provide an ample margin of safety to protect public health (section IV.C of the proposed rule preamble, 86 FR 3095, January 14, 2021).

2. How did the risk review change for the Refractory Products Manufacturing source category?

We have not changed any aspect of the risk assessment for this source category as a result of public comments received on the January 2021 proposal.

3. What key comments did we receive on the risk review, and what are our responses?

We received comments in support of and against the proposed residual risk review. Having carefully considered these comments, it is our determination that no revisions are warranted under CAA section 112(f)(2) for the Refractory Products Manufacturing source category. Generally, the comments that were not supportive of the risk review determination suggested changes to the underlying risk assessment methodology. For example, one commenter stated that the EPA should account for the increased risks due to exposure to multiple sources of HAP, use more health-protective dose-response values, and consider increased risks in childhood and from prenatal exposure. After review of all the comments received, we determined that no changes to our Science Advisory Board-approved review process were necessary. The comments and our specific responses can be found in the document, *Summary of Public Comments and Responses on Proposed Rule: National Emission Standards for HAP for Refractory Products Manufacturing (40 CFR part 63, subpart SSSSS), Residual Risk and Technology Review, Final Amendments*, available in the docket for this action (Docket ID No. EPA-HQ-OAR-2020-0148).

4. What is the rationale for our final approach and final decisions for the risk review?

As noted in our proposal, the EPA sets standards under CAA section 112(f)(2) using "a two-step standard-setting approach, with an analytical first step to determine an 'acceptable risk' that considers all health information, including risk estimation uncertainty, and includes a presumptive limit on the maximum individual risk (MIR) of "approximately 1-in-10 thousand" (see 54 FR 38045, September 14, 1989). We weigh all health risk factors in our risk acceptability determination, including the cancer MIR, cancer incidence, the maximum cancer TOSHI, the maximum acute noncancer HQ, the extent of noncancer risks, the distribution of cancer and noncancer risks in the exposed population, and the risk estimation uncertainties.

Since proposal, neither the risk assessment nor our determinations regarding risk acceptability, ample margin of safety, or adverse environmental effects have changed. For the reasons explained in the proposed rule, we have determined that the risks from the Refractory Products Manufacturing source category are acceptable, and that the current standards provide an ample margin of safety to protect public health and prevent an adverse environmental effect. Therefore, we are not revising the subpart to require additional controls pursuant to CAA section 112(f)(2) based on the residual risk review, and we are readopting the existing standards under CAA section 112(f)(2).

B. Technology Review for the Refractory Products Manufacturing Source Category

1. What did we propose pursuant to CAA section 112(d)(6) for the Refractory Products Manufacturing source category?

Based on our technology review, we proposed improvements to the existing underlying work practices as required by CAA section 112(d)(6) during scheduled maintenance of THC control devices. These revisions are necessary to reflect technical developments in pollution

control practices since the promulgation of the original standard for this source category and reflect the best practices of one affected facility. Specifically, for affected continuous kilns using THC emission control devices, we proposed to limit the number of hours for bypass of the control device to conduct scheduled maintenance, schedule the manufacture of product with binder applicability of the standard to THC emission control devices, limit the number of hours for percentages at the lower end of the range produced during periods of control device bypass. We also proposed to include the THC emissions for these periods in the semi-annual compliance report. A brief summary of the EPA's findings in conducting the technology review of refractory products manufacturing operations was included in the preamble to the proposed rule (86 FR 3095, January 14, 2021), and a detailed discussion of the EPA's technology review and findings was included in the memorandum, *Technology Review for the Refractory Products Manufacturing NESHAP*, available in the docket for this action (Docket Item No. EPA-HQ-OAR-2020-0148-0008).

2. How did the technology review change for the Refractory Products Manufacturing source category?

For the final rule, we revised aspects of two work practice standards from the proposal, based on public comments. First, we are finalizing slightly different improvements than proposed for the work practice standard that applies when a continuous kiln THC control device is bypassed for scheduled maintenance. In particular, to demonstrate compliance with the requirement in 40 CFR 63.9792(e)(2) to minimize HAP emissions during the period when the kiln is operating and the control device is out of service, the owner or operator will be required to maintain the organic HAP processing rate (lb/hr) below either the average organic HAP processing rate based on the actual production on a 6-month rolling basis (not to include periods

of kiln shut down) or the HAP processing rate (lb/hr) that coincides with the lowest hour of the most recent 3-hour performance test, whichever is lower. This requirement replaces the proposed limitation of five kiln cars with products for which the mass fraction of organic HAP in the resins, binders, and additives is greater than the average for the year. Second, we are revising the work practice standard to use natural gas, or equivalent, as the kiln fuel by removing the exception for periods of natural gas curtailment or supply interruption.

3. What key comments did we receive on the technology review, and what are our responses?

We received both supportive and adverse comments on various aspects of our technology review for refractory products manufacturing. The key comments and responses are provided in this section; summaries of comments not discussed in this preamble and the EPA's responses can be found in the comment summary and response document, available in the docket.

Comment: One commenter provided technical comments on the specific provisions that the EPA proposed to limit production during periods when the THC control device is being bypassed for maintenance. The proposed provisions would have required manufacturing mostly product in the tunnel kiln that contains a mass fraction of organic HAP in the resins, binders, and additives that is less than the average organic HAP mass fraction of these constituents for the year (on a 12-month rolling basis), and manufacture of the product with an organic HAP mass fraction greater than the average for the year would be limited to only five kiln cars during such maintenance periods.

The commenter explained that tunnel kilns comprise a preheating zone, firing zone, and cooling zone in sequence with kiln cars passing through the system containing pressed/formed refractory. Each kiln is designed to hold a set number of kiln cars in the preheating zone position and a separate set number of kiln cars in the firing zone position. The type and amount of resins,

binders, and additives in the kiln are dictated by each product type's formulation. During drying in the tunnel kilns, organic HAP in resins, binders, and additives is volatilized and either destroyed in the tunnel kiln or exhausted to a THC control device for destruction.

The commenter noted that according to the memorandum *Technology Review for the Refractory Products Manufacturing NESHAP*, available in the docket for this action (Docket Item No. EPA-HQ-OAR-2020-0148-0008), these proposed provisions are based on the facility's specific internal operation procedures for the regenerative thermal oxidizer (RTO) unit that state that tunnel kiln batches exceeding 90 binder counts can only be pushed in a train of "five cars or less." The commenter asserted that the EPA has catered the five-kiln car provision too specifically to the facility's one tunnel kiln due to extremely limited data, as the facility is the only U.S. nonclay refractory producer using organic binder and a THC control device. The commenter further stated that these procedures only address one of the two continuous kilns at the facility. The commenter also stated that since kiln cars can hold a variety of refractory products of varying dimensions and formulation, the mass of organic HAP emissions from the resins, binders, and additives from car to car is variable. The commenter noted that a new nonclay refractory tunnel kiln could potentially be constructed with larger kiln cars, such that each kiln car could be designed to hold a greater mass of nonclay refractory and emit much more organic HAP while still satisfying the proposed provisions during periods of control device maintenance.

The commenter suggested that instead the proposed requirements that apply during THC control device bypass for continuous kilns should be amended to reflect a more universal operating parameter limit (OPL). The OPL is established during performance testing in accordance with 40 CFR 63.9800 and Table 4 to subpart SSSSS. Each continuous unit is

required to establish a 3-hour block operating limit for maximum allowable organic HAP processing rate, which is calculated as the average organic HAP processing rate from performance testing plus 10 percent in accordance with 40 CFR 63.9798(c) and EPA guidance. The commenter suggested that the organic HAP processing rate during THC control device bypass be limited to the average organic HAP processing rate from the most recent performance test demonstration, as determined on an hourly basis (*i.e.*, 1-hour block average). The commenter also provided suggested revisions to the regulatory language to implement this suggestion.

Response: The EPA proposed an improved work practice standard to further minimize emissions during periods of scheduled maintenance and bypass of the thermal oxidizer as a result of the CAA section 112(d)(6) technology review process. In addition to the current work practice to minimize emissions during these periods, we proposed other measures based on the best practices of one facility. These included: 1) limiting the applicability to THC control devices; 2) an annual limit on the number of hours for bypass of the control device; 3) the requirement to process product containing lower percentages of organic HAP content in the resins, binders and additives (less than the average organic HAP mass fraction); 4) an allowance for the processing of five kiln cars per year with greater than average organic HAP mass fraction; and 5) reporting of the mass of organic HAP emissions for bypass periods in the semi-annual compliance report.

As a result of the comments regarding these proposed measures, we learned we did not have full knowledge of the details of the facility's internal operating procedures during scheduled maintenance and bypass of the thermal oxidizer. As the commenter clarified, tunnel kiln batches exceeding 90 binder counts (a measure of the volume of binder) can only be pushed in a train of "five cars or less" during these periods. The commenter also clarified this procedure applies to only one of the two continuous tunnel kilns. We agree with the commenter that using

the "kiln car" limitation is an imprecise way of limiting organic HAP emissions due to the potential variation in kiln car size. However, the EPA found the facility's suggestion to set an operating limit during bypass periods equal to the "average organic HAP processing rate from the most recent performance test, as determined on an hourly basis (1-hour block average)" and rule language edits to be inconsistent with other rule requirements. Specifically, because performance tests are required to be conducted while the source is operating at the maximum organic HAP processing rate as defined in §63.9824, we found this suggestion to be inconsistent with the rule requirement to minimize emissions during control device bypass and maintenance required by §63.9792(e)(2).

We are therefore finalizing revisions to the proposed revised work practice standard that reflect additional improvements as a result of these comments and follow-up discussions with the facility to clarify their best practices. Specifically, we are revising the proposed work practice to limit the organic HAP processing rate rather than the organic HAP content during control device bypass and maintenance as proposed. The proposed rule language that required the facility to minimize HAP emissions during the period when the kiln is operating and the control device is out of service by "scheduling of the manufacture of product for which the mass fraction of organic HAP in the resins, binders, and additives is at the lower end of the range produced (*i.e.*, below the typical average mass fraction of organic HAP in the resins, binders, and additives)" is revised to "maintaining the organic HAP processing rate (lb/hr) below the average organic HAP processing rate based on actual production on a 6-month rolling basis (not to include periods of kiln shut down) or below the organic HAP processing rate (lb/hr) that coincides with the lowest hour of the most recent 3-hour performance test, whichever is lower." We are then requiring sources to demonstrate compliance with the requirement to minimize emissions by maintaining

the organic HAP processing rate (lb/hr) during control device maintenance and bypass below lower of the two organic HAP processing rates described above. We are also revising the proposed reporting requirements to reflect these changes. In addition, we are removing the allowance for the processing of five kiln cars per year with greater than average organic HAP mass fraction from the work practice. Changing the work practice requirement from the mass fraction of organic HAP in the product to the HAP processing rate while also removing the reference to kiln cars provides a clearer and more consistent metric for demonstrating that HAP emissions have been minimized and provides the facility with options for minimizing emissions during the period when the kiln is operating and the control device is out of service (*e.g.*, loading kiln cars with products with lower HAP contents, reducing the number of kiln cars pushed through the kiln per hour).

In summary, the finalized work practice standard for periods of control device maintenance and bypass includes: 1) the proposed limit of the applicability to THC control devices; 2) the proposed annual limit on the number of hours for bypass of the control device; 3) the revised requirement to maintain the organic HAP processing rate below the average organic HAP processing rate, determined as the lower of either a) the average organic HAP processing rate (lb/hr) based on actual production on a 6-month rolling basis, not to include periods of kiln shut down) or b) the organic HAP processing rate determined during the lowest hour of the most recent performance test; and 4) semiannual compliance reporting of the following information: the average organic HAP processing rate based on actual production on a 6-month rolling basis (not to include periods of kiln shut down) or the lowest hour from the most recent performance test (whichever is lower), the actual organic HAP processing rate, the amount of product produced and the mass of organic HAP in the product produced, the estimated THC emissions,

the number of hours the control device was bypassed during the compliance period (as proposed), and the cumulative number of hours the control device was bypassed over the last 12-month period (as proposed). The final improvement of the work practice standard as a result of the CAA section 112(d)(6) technology review process does not include the proposed allowance for processing of five kiln cars per year with greater than average organic HAP mass fraction during control device maintenance and bypass.

Meeting minutes from the discussion with the facility and follow-up emails are included in the rulemaking docket (Docket ID No. EPA-HQ-OAR-2020-0148).

Comment: One commenter noted that the EPA proposed to limit the number of hours during which a continuous kiln is operating and the THC control device is bypassed for maintenance to 750 hours per year on a 12-month rolling basis. The commenter noted that the EPA identified this provision as an improvement to the current standard since there is no limit on the total amount of time the provision may be used other than the requirement for the owner or operator to minimize the amount of time for each bypass.

The commenter also noted that per proposed requirements in 40 CFR 63.9792(e) and 63.9812(g), kiln operation during bypass of the THC control device requires advanced approval from the Administrator (86 FR 3079, 3099, January 14, 2021). The commenter noted that the EPA also proposed that affected sources must document the planned maintenance procedures in the OM&M plan, and the proposed requirement in 40 CFR 63.9814(c)(7) would require reporting in the semi-annual compliance report for these periods, including a statement of whether or not the control device maintenance was included in the approved request to bypass the control device while scheduled maintenance is performed. The EPA has proposed to allow 181 days for compliance with the proposed revisions, noting that this time would be used to

update the OM&M plans and seek approval from the Administrator before taking the control device on the affected kiln out of service for scheduled maintenance.

The commenter stated that the proposed requirement for Administrator approval is based on its current state-issued title V permit. The commenter noted that the state has delegated authority and is the "Administrator" in regard to implementing and enforcing the NESHAP requirements at 40 CFR part 63. The commenter clarified that the current title V permit requires advance notification via e-mail to the state air quality inspector and to the Regional Air Quality staff that the RTO will be out of service for scheduled maintenance, but the permit does not include approval requirements. In addition, the commenter stated that the EPA did not differentiate between THC control device planned and unplanned maintenance and did not specify the scope of maintenance (*e.g.*, washdowns, bakeouts, media placement) to be documented in the OM&M plan. Because the proposed provisions require approval from the Administrator in advance, the commenter noted that it appears kiln operation during unplanned maintenance events is not addressed.

The commenter requested that the EPA amend 40 CFR 63.9792(e), 63.9812(g), 63.9814(c)(7), Table 3, and Table 9 to specify that kiln operation during periods of control device maintenance requires "Administrator notification" and not "Administrator approval." The commenter suggested that the notification could include a telephone call or e-mail to the Administrator within 24 hours of a bypass event. The commenter asserted that this provision would allow for unplanned/emergency maintenance, which is common for continuous process units, particularly where facilities operate 24 hours a day, 365 days a year. Additionally, requiring notification rather than approval for each bypass allows facilities to avoid complete shutdown of a process unit if the Administrator cannot be reached for approval (*e.g.*, control

device requires unplanned maintenance at 3 AM on Saturday and Administrator cannot be reached until 9 AM Monday). The commenter noted that the EPA's proposed recordkeeping and reporting requirements related to the 750-hour (12-month rolling basis) limit on use of the bypass provisions would still adequately qualify these bypasses with Administrator notification versus approval. The commenter also asserted that requiring notification instead of approval does not restore "malfunction" provisions, as the term is defined under 40 CFR 63.2, as the bypass period is limited to 750 hours per year (12-month rolling basis). Also, per *U.S. Sugar Corp. v. EPA*, 830 F.3d 579, 606-610 (2016), the Administrator may determine whether the facility took good faith efforts to minimize resulting emissions including preventative and corrective actions and whether excess emissions were caused by poor maintenance or careless operation.

Response: The EPA disagrees with the commenter's characterization of the proposed requirements in 40 CFR 63.9792(e) and 63.9812(g), regarding kiln operation during bypass of the THC control device and advanced approval from the Administrator (86 FR 3099, January 14, 2021). The EPA agrees these citations pertain to kiln operation during bypass of the THC control device and advanced approval from the Administrator, but these provisions are original rule requirements that were not proposed to be amended. The original general requirements for complying with subpart SSSSS are contained in 40 CFR 63.9792, and 40 CFR 63.9792(e) specifically permits the continued operation of a continuous kiln during bypass and scheduled maintenance of the control device for that kiln, provided the owner or operator meets the requirements of the work practice standard and requests and receives approval by the Administrator per 40 CFR 63.9792(e)(1), which requires a separate request each time the owner or operator plans to bypass the control device for scheduled maintenance. Similarly, the original requirements for notifications for subpart SSSSS are contained in 40 CFR 63.9812, and 40 CFR

63.9812(g) specifically states that owner and operators must request approval from the Administrator before bypassing the control device, as specified in 40 CFR 63.9792(e), and that a separate request must be submitted for approval each time.

We also disagree with the statement that the EPA proposed a new requirement that affected sources must document the planned maintenance procedures in the OM&M plan, as this requirement was also required in the original rule at 40 CFR 63.9794(a)(6). The provisions in 40 CFR 63.9794(a)(6) pertain to any maintenance that requires use of the bypass provisions. The provision includes "procedures for the proper operation and routine and long-term maintenance of each process unit and [air pollution control device]," which encompasses the more specific types of maintenance described by the commenter (*e.g.*, washdowns, bakeouts, media placement). Further, subpart SSSSS does not include the terms "planned maintenance" or "unplanned maintenance," nor does it define "scheduled maintenance." However, as noted earlier in this response, a request for Administrator approval must be submitted each time the owner or operator plans to bypass the control device for "scheduled maintenance," and per Table 2 to subpart SSSSS, the owner or operator must receive approval from the Administrator before taking the control device on the affected kiln out of service for scheduled maintenance.

After review of the commenter's request, we are not amending the requirements to request Administrator approval, and we also disagree with the comment that there is a need to differentiate between THC control device "planned and unplanned maintenance" within subpart SSSSS. The EPA did not propose to amend the requirement to request Administrator approval each time an owner or operator plans to bypass the control device, and we conclude that allowing notification rather than approval would not be an improvement to the standard. In particular, if owners and operators were allowed to comply with the work practice standard during periods of

maintenance that are only "scheduled" a few hours in advance of the control device bypass, those owners and operators would likely find it very challenging to comply with all the specific requirements that must be met during bypass to demonstrate compliance with the requirement in 40 CFR 63.9792(e)(2) to minimize HAP emissions during the bypass. Therefore, the work practice standard we are finalizing for periods of control device bypass and scheduled maintenance applies to all THC control device bypasses for scheduled maintenance for which the owner or operator receives approval from the Administrator. Most of the maintenance activities described by the commenter are likely to be considered "scheduled maintenance" for which the owner or operator will be able to request advanced approval from the Administrator before the control device is bypassed. These maintenance activities are the activities that should be documented in the OM&M plan. Bypass of the control device without Administrator approval would be considered a deviation from the standard.

Finally, the EPA agrees with the commenter that the state has delegated authority and is the "Administrator" with regard to implementing and enforcing the 40 CFR subpart SSSSS requirements. However, the state does not have the authority to set standards less stringent than those promulgated by the Administrator in accordance with CAA section 112(l). Therefore, in order for the current title V permit to satisfy the 40 CFR 63.9792(e) and 63.9812(g) requirements, it must require advance approval by the Administrator and not the less stringent notification requirements.

Comment: One commenter stated that the EPA must remove the alternative fuel allowance provision. The commenter noted that the existing standards contain a provision allowing for "the use of alternative fuels" (such as fuel oil, propane, and pulverized coal) during certain circumstances as an exception to the work practice standard that requires use of natural

gas as the core emission control requirement. The commenter noted that the EPA has recognized this provision allows for an exception from the standards in "situations analogous to malfunctions" and explained in 2003 that its justification for this provision was similar to the SSM exemption. At the time, the EPA stated that, "Just as an exceedance of emission limits during a malfunction is not considered a violation, as indicated in 40 CFR 63.6(f)(1) and (h)(1), we believe that using other fuels during periods when natural gas is unavailable should also not be considered a violation of the work practice standard for clay and chromium refractory products kilns" (68 FR 18740, April 16, 2003).

The commenter stated that to the extent that the EPA retains this work practice standard as the sole or an additional control, it must remove the illegal alternative fuel allowance provision. The commenter further stated that including this provision means that the emission standard (*i.e.*, the fuel requirement) is not "continuous" and does not apply at all times, which is a violation of CAA sections 302(k) and 112. The commenter asserted that the EPA should recognize this allowance is as unlawful as the SSM exemption that it has recognized the need to remove (*Sierra Club*, 551 F.3d at 1022), and therefore the EPA should remove this specific malfunction exemption as well. Failing to do so would violate CAA section 112(d)(6), by refusing to make a "necessary" revision to assure compliance with the CAA, and it would be arbitrary because it would leave in place a harmful exemption that allows the release of more pollution than CAA section 112 allows, based on the illegal justification of a "malfunction." In this instance, the commenter noted, such a "malfunction" may simply be an increase in natural gas prices, making this allowance particularly arbitrary because it conflicts with the CAA's public health objective and the floor requirement to assure emission standards based on the "achieved" emission reductions, without consideration of cost.

Response: The EPA agrees with the commenter that the existing standards require the use of natural gas or equivalent fuel. It also allows "the use of alternative fuels" during "periods of natural gas curtailment or supply interruption" as defined in 40 CFR 63.9824. Propane is considered to be a fuel that is equivalent to natural gas, not an alternative fuel, as stated by the commenter.

The current rule requirements related to alternative fuel usage state that procedures for alternative fuel usage must be included in the OM&M plan per 40 CFR 63.9794 (a)(10)(i), require notification of alternative fuel usage within 48 hours of the declaration of a period of natural gas curtailment or supply interruption per 40 CFR 63.9812(f), and reporting of termination of alternative fuel usage within 10 working days per 40 CFR 63.9814. The "period of natural gas curtailment or supply interruption" is defined in 40 CFR 63.9824 as "the period of time during which the supply of natural gas to an affected facility is halted for reasons beyond the control of the facility. An increase in the cost or unit price of natural gas does not constitute a period of natural gas curtailment or supply interruption."

The alternative fuel allowance was added to the rule as a result of comments from the industry on the 2002 proposed rule, in which the EPA proposed the use of natural gas or other such clean fuel to prohibit the use of coal, fuel oil, waste oil, or equivalent fuels and the resulting emissions of HF, HCl or HAP metals from existing clay refractories (67 FR 42122, June 20, 2002). The EPA provided the justification for the allowance referenced by the commenter in the memo titled *Summary of Public Comments and Responses on the Proposed NESHAP for Refractory Products Manufacturing (*Docket ID OAR-2002-0088, Item No. V-C-01, page 12). Industry stakeholders opposed the 2002 proposed work practice that required use of natural gas, stating that many kilns were designed to use fuels other than natural gas and the need to use these

alternative fuels arises during natural gas shortages or price increases. They also stated that during natural gas shortages, residential users receive priority over industrial users of natural gas and that prohibiting the use of alternative fuels could adversely impact the viability of some refractory operations. After considering those comments, the EPA finalized the alternative fuel allowance (73 FR 18736, April 16, 2003). The EPA did not consider a price increase to be a justification for alternative fuel use at that time and omitted that reason from the natural gas curtailment definition. Contrary to the commenter's argument, this definition expressly states that an increase in natural gas prices does not constitute a period of natural gas curtailment or supply interruption, so the commenter's claim that such a "malfunction" may simply be an increase in natural gas prices is not valid.

We acknowledge much has changed since the original NESHAP was promulgated in 2003. For this final action, the facilities in the source category confirmed they use natural gas and propane during normal operations in accordance with the NESHAP and state requirements. In the event of a natural gas curtailment or supply interruption, they indicated they would not switch to another fuel due to the fuel-specific burner technology in use. They stated they would either continue to use equivalent fuel (propane backup) or shut down and retool their process units to use equivalent fuel (propane) or an alternative fuel (fuel oil) since they have no back-up supply of propane and it would likely also be curtailed due to demand. The EPA document titled *AP-42, Section 1.5 Liquified Petroleum Gas Combustion, updated July 2008,* further supports that response, explaining that burner design technology is specific to fuel type and that retooling may even be required when changing the fuel type from natural gas to propane. Retooling may include replacement of fuel injector tips and/or vaporizers to provide burners with the proper fuel to air ratio. In addition, as noted previously in this preamble, there are no facilities currently

subject to subpart SSSSS that manufacture chromium refractory products. Based on the changes in in kiln and burner design technologies since 2003, and on the determination that propane backup is available (or if retooling is required, retooling can be done for propane instead of other alternative fuels) for all existing sources subject to this standard and can be part of the design of new sources, we are removing the alternative fuel usage allowance. As a result, the use of alternative fuels will not be permitted and will be a deviation from the work practice standard, which will apply during normal operation as well as during periods of natural gas curtailment/supply interruption. The removal of the natural gas alternative fuel allowance and the requirement to use natural gas or equivalent fuels reflects a development in our understanding of refractory kiln fuel combustion technology since promulgation of the original standard.

4. What is the rationale for our final approach for the technology review?

For the reasons explained in the preamble to the proposed rule (86 FR 3095, January 14, 2021), we proposed amendments to improve the work practice standard that applies when a continuous kiln THC control device is bypassed for maintenance to reflect technical developments in pollution control practices since the promulgation of the original standard. We evaluated all of the comments received on these improvements and the EPA's proposed amendments, and for the reasons explained in the comment responses in section IV.B.3 of this preamble, we are finalizing amendments to the proposed work practice standard to further improve the work practices based on the best practices of one affected source in the source category. We are also finalizing amendments to the existing work practice standard that permits the use of alternative fuels when natural gas or equivalent fuel is not available, after review of the fuel combustion technology used by sources in the source category in response to public comments. Further explanation is included in the comment responses in section IV.B.3 of this

preamble. The removal of the natural gas alternative fuel allowance and the requirement to use natural gas or equivalent fuels reflects a development in our understanding of refractory kiln fuel combustion technology since promulgation of the original standard.

C. CAA Sections 112(d)(2) and (3) Amendments for the Refractory Products Manufacturing Source Category

1. What amendments did we propose pursuant to 112(d)(2) and (3) for the Refractory Products Manufacturing source category?

In the January 14, 2021 action, we proposed amendments to the Refractory Products Manufacturing NESHAP to address previously unregulated HAP for affected sources in the clay and nonclay refractory subcategories pursuant to 112(d)(2) and (3).

a. Clay Refractory Sources

For new and existing clay refractory kilns, we proposed MACT floor limits for Hg and for PM (as a surrogate for non-Hg metal HAP), in addition to the current NESHAP requirements for clay refractory sources, based on emissions test data for existing clay refractory kilns. The emissions test data for existing clay kilns reviewed for this action confirmed trace (but measurable) amounts of non-Hg metal HAP and Hg emissions. As a result, we proposed MACT floor limits of 3.1 lb/hr for PM and 6.1 micrograms per dry standard cubic meter (μg/dscm), corrected to 18 percent oxygen, for Hg for each new kiln used to produce clay refractory products. We proposed MACT floor limits of 9.5 lb/hr for PM and 18 μg/dscm, corrected to 18 percent oxygen, for Hg for each existing kiln used to produce clay refractory products. Similar to other source categories, we proposed a limit for PM (as a surrogate for non-Hg metal HAP) because the metal HAP are contained in the PM and the control techniques that would be used to control PM will equally control non-Hg metal HAP. To demonstrate compliance with the

emission limits, we proposed initial and repeat 5-year performance testing for the regulated pollutants, continuous parameter monitoring, and daily visible emissions (VE) checks. Owners and operators whose clay refractory products kilns are equipped with a fabric filter to reduce PM (as a surrogate for non-Hg metal HAP) have the option of demonstrating compliance using a bag leak detection (BLD) system instead of daily VE checks.

We also evaluated the beyond-the-floor option of requiring all existing sources to meet the proposed new source MACT standards for Hg and PM (as a surrogate for total non-Hg metal HAP). We concluded that the costs of the necessary controls were not reasonable relative to the level of emission reduction achieved for either the Hg or PM beyond-the-floor options. In addition, these controls would create additional solid waste, as there would be a need to dispose of the collected metal-contaminated dust. Therefore, we did not propose beyond-the-floor limits for Hg or PM. A brief discussion regarding the derivation of the Hg and PM limits and the beyond-the-floor option was included in the preamble to the proposed rule (86 FR 3095, January 14, 2021), and a detailed discussion is included in the technical memorandum titled *Development of Proposed Standards and Impacts for the Refractory Products Manufacturing NESHAP*, located in the docket for this action (Docket Item No. EPA-HQ-OAR-2020-0148-0014).

b. Nonclay Refractory Sources

For new and existing curing ovens, shape dryers, and kilns that are used to process refractory products that use organic HAP (*i.e.*, nonclay refractory sources), we proposed a work practice standard to use natural gas as fuel to limit metal HAP emissions (except during periods of natural gas curtailment or supply interruption) as provided in CAA section 112(h) in lieu of a numerical emissions standard, in addition to the current NESHAP THC limits for new and existing nonclay refractory sources. These sources currently employ the use of thermal oxidizers,

regenerative thermal oxidizers and catalytic oxidizers to meet the THC limit, however, the NESHAP did not require sources to use natural gas as fuel for sources in this subcategory because the metal HAP emissions were determined to be below measurable quantities due to the use of purified nonclay raw materials. Available HAP data for these sources in the 2017 National Emission Inventory (NEI) were found to be outdated and not reflective of current operating conditions. The 2017 NEI included measurable PM emissions for these existing nonclay refractory sources, and the PM would be expected to have trace amounts of metal HAP; however, we have no emission stack test data to indicate measurable emissions of metal HAP for these existing nonclay refractory sources.[2] Therefore, as discussed in the preamble to the proposed rule (86 FR 3095, January 14, 2021), we proposed a work practice standard to use natural gas as fuel for new and existing nonclay refractory sources to limit metal HAP emissions in lieu of a numerical emissions standard in accordance with CAA section 112(h).

2. How did the 112(d)(2) and (3) amendments change for the Refractory Products Manufacturing source category?

We are making one change to the proposed CAA section 112(d)(2) and (3) amendments. For each new kiln used to produce clay refractory products, we are finalizing the proposed MACT floor limits of 3.1 lb/hr for PM (as a surrogate for metal HAP) and 6.1 μg/dscm, corrected to 18 percent oxygen, for Hg. For each existing kiln used to produce clay refractory products, we are finalizing the proposed MACT floor limits of 9.5 lb/hr for PM (as a surrogate for metal HAP) and 18 μg/dscm, corrected to 18 percent oxygen, for Hg. We are also finalizing

[2] Thus, while we believe that there are metal HAP emissions, the lack of data showing measurable emissions leads the EPA to conclude that the application of measurement methodology to this class of sources is not practicable due to technological and economic limitations. *See* CAA 112(h)(2)(B).

the proposed requirements for initial and repeat 5-year performance testing, continuous parameter monitoring, daily VE checks, and the option of demonstrating compliance using a BLD system instead of daily VE checks for clay refractory products kilns equipped with a fabric filter to reduce PM (as a surrogate for metal HAP). For each new and existing affected source used to produce nonclay refractory products, we are finalizing the work practice standard to use natural gas as fuel to limit metal HAP emissions as provided in CAA section 112(h) in lieu of a numerical emissions standard generally as proposed. However, based on the review of combustion technologies prompted by public comments on the existing work practice standard to use natural gas as fuel (see section IV.B.3 of this preamble), the finalized work practice for new and existing sources used to produce nonclay refractory products requires the use natural gas or an equivalent fuel at all times, without an exception during periods when natural gas is not available.

3. What key comments did we receive on the 112(d)(2) and (3) amendments and what are our responses?

We received one general comment supporting the proposed CAA section 112(d)(2) and (3) amendments for refractory products manufacturing. The comment letter also included recommendations for more stringent standards under CAA section 112(d)(2) and (3) for this source category.

Comment: One commenter supported the EPA's proposed decision to set numeric emission standards for Hg and for PM as a surrogate for non-Hg metal HAP for existing clay refractory sources. The commenter noted that setting limits for all unregulated sources of HAP emissions in this category is required by CAA section 112(d)(6) (see *LEAN v. EPA*, 955 F.3d 1088). However, the commenter asserted that the proposed limits are not strong enough to satisfy

the CAA section 112(d)(2)-(3) requirements and that the standards must reflect the maximum achievable degree of emission limitation. First, the commenter stated that the limits were set using insufficient data and that it is not clear why the EPA did not use its authority under CAA section 114 to collect additional emission data. Second, the commenter stated that the "upper prediction limit" (UPL) methodology of setting standards is not consistent with the statutory requirement of the floor as the "average emission limitation" achieved by the best-performing sources, which violates CAA section 112(d)(3) and is arbitrary. Therefore, the commenter stated, the proposed standards do not come close to the "maximum achievable" degree of emission reduction.

Response: As courts have regularly upheld, the EPA has wide latitude in determining the extent of data gathering necessary to solve a problem and courts generally defer to the Agency's decision to proceed on the basis of imperfect scientific information, rather than to "invest the resources to conduct the perfect study." *Sierra Club v. EPA*, 167 F. 3d 658, 662 (DC Cir. 1999)) ("If EPA were required to gather exhaustive data about a problem for which gathering such data is not yet feasible, the agency would be unable to act even if such inaction had potentially significant consequences...[A]n agency must make a judgment in the face of a known risk of unknown degree." *Mexichem Specialty Resins, Inc.,* 787 F.3d. 561 (D.C. Cir. 2015)).

Contrary to the commenter's assertion, the EPA had sufficient data available from the two clay refractory products kilns at Whitacre-Greer to calculate MACT floors, so additional data collection was not necessary. In the case of PM, multiple sets of emissions test data were available for each of the two kilns, allowing for a data set for each kiln that was robust enough that the EPA did not need to evaluate the uncertainty associated with a limited dataset for either kiln. Further, as noted in the memorandum *Emissions Data Used to Develop the Refractory*

Products Manufacturing Risk and Technology Review (RTR) Risk Modeling Input Files (Docket Item No. EPA-HQ-OAR-2020-0148-0006), St. Gobain has three batch tunnel kilns and two continuous tunnel kilns capable of producing both clay and nonclay refractories, so they would be subject to the proposed standards for PM and Hg when producing clay refractories. However, 40 CFR 63.9824 defines a clay refractory product as "a refractory product that contains at least 10 percent uncalcined clay by weight prior to firing in a kiln" and includes six classifications of clay (ball clay, bentonite, common clay and shale, fire clay, fuller's earth, and kaolin). Based on the 2017 raw material information provided by St. Gobain when the EPA was developing the inputs file for the risk modeling, the quantities of clay fired do not meet the 10 percent threshold for the manufacture of clay refractories and are more consistent with the use of clay as a binder, so these kilns are expected to be subject to the clay refractory kiln standards infrequently. Therefore, it is not clear that using the authority under CAA section 114 for these kilns would have yielded any additional PM or Hg data for clay refractory kilns. In other words, if the EPA had requested emissions testing under CAA section 114 for these five kilns when they manufacture clay refractories, the EPA would have had to wait for the facility to change their product on each kiln, which may not have been feasible.

Regarding the UPL approach, in August 2013, the D.C. Circuit issued its decision in *National Association. of Clean Water Agencies (NACWA) v. EPA*, which addressed challenges to the EPA's 2011 Sewage Sludge Incinerator (SSI) rule, issued under section 129 of the CAA. In *NACWA v. EPA*, the court remanded the EPA's use of the UPL methodology to the Agency for further explanation of how the methodology reflected the average emissions limitation achieved by the best-performing 12 percent of sources (for existing sources) and the average emissions limitation achieved by the best-performing similar source (for new sources). *NACWA v. EPA*,

734 F.3d 1115, 1151. Because the UPL methodology used in the SSI rule was the same as that used in the major source Boiler MACT (40 CFR part 63, subpart DDDDD), the EPA requested a remand of the record in *U.S. Sugar v. EPA* in order to address the court's decision in *NACWA v. EPA*. The EPA prepared a memorandum explaining the methodology for the UPL. This memorandum, the EPA's *Response to Remand of the Record for Major Source Boilers*, provides a detailed rationale to use the UPL as the basis of setting a MACT floor for new and existing sources, and the methodology and the explanation in the memorandum were upheld by the D.C. Circuit in *U.S. Sugar v. EPA*, 830 F.3d at 639. Following the UPL memorandum, the EPA issued a subsequent memorandum specifically addressing the application of the UPL methodology when setting MACT emission limits with limited datasets, *Approach for Applying the Upper Prediction Limit to Limited Datasets*. In that memorandum, the EPA concluded that there are additional considerations when setting MACT floors for limited datasets. The D.C. Circuit agreed that the EPA sufficiently explained the general application of the UPL approach to small datasets in *Sierra Club v. EPA*, 895 F.3d 1, 14 (D.C. Cir. 2018). The MACT floors were set consistent with EPA guidance and with previous court decisions.

4. What is the rationale for our final approach for the 112(d)(2) and (3) amendments?

For the reasons explained in the preamble to the proposed rule (86 FR 3095, January 14, 2021), and in the comment responses in sections IV.B.3 and IV.C.3 of this preamble and the comment summary and response document (available in the docket for this rulemaking), we are finalizing a work practice requirement to use natural gas at all times for new and existing clay refractory product sources, and we are making no changes and are finalizing the proposed 112(d)(2) and (3) amendments for clay refractory kilns in the Refractory Products Manufacturing source category.

D. SSM Amendments for the Refractory Products Manufacturing Source Category

1. What SSM amendments did we propose for the Refractory Products Manufacturing source category?

We proposed amendments to the Refractory Products Manufacturing NESHAP to remove and revise provisions related to SSM that are not consistent with the 2008 court decision that the standards apply at all times. More information concerning the elimination of SSM provisions is provided in the preamble to the proposed rule (86 FR 3095, January 14, 2021).

2. How did the SSM amendments change for the Refractory Products Manufacturing source category?

We are finalizing the SSM provisions as proposed with no changes (86 FR 3095, January 14, 2021).

3. What key comments did we receive on the SSM amendments and what are our responses?

We received one general comment supporting the proposed amendments to the SSM provisions for refractory products manufacturing and three comments requesting that the rule requirements for this source category apply at all times, not just during periods of SSM.

4. What is the rationale for our final approach for the SSM provisions?

For the reasons explained in the proposed rule and after evaluation of the comments on the proposed amendments to the SSM provisions for the Refractory Products Manufacturing NESHAP, we are finalizing the proposed amendments related to SSM that are not consistent with the requirement that the standards apply at all times. More information concerning the proposed amendments to the SSM provisions is in the preamble to the proposed rule (86 FR 3095, January 14, 2021).

E. Electronic Reporting Amendments for the Refractory Products Manufacturing Source Category

1. What electronic reporting amendments did we propose for the Refractory Products Manufacturing source category?

In the January 14, 2021, notice we proposed amendments to subpart SSSSS to require owners and operators of refractory product manufacturing facilities to submit electronic copies of NOCS reports, performance test results, and performance evaluation results through the EPA's CDX using CEDRI.

The proposed amendments apply to the NOCS required by 40 CFR 63.7(b) and (c), 40 CFR 63.8(f)(4), 40 CFR 63.9(b) through (e) and (h) and 40 CFR 63.9812, and performance test results and performance evaluation results required by 40 CFR 63.9(h), 40 CFR 63.9800, and 40 CFR 63.9814. The proposal would require that all NOCS be submitted as portable document format (PDF) files and uploaded to CEDRI. For performance test and performance evaluation results, the proposal would require test results that use test methods supported by the EPA's ERT listed on the ERT website[1] at the time of the test be submitted in the format generated through the use of the ERT or an electronic file consistent with the extensible markup language (XML) schema on the ERT website. Performance test results using test methods that are not supported by the ERT at the time of the test would be required to be submitted as a PDF file using the attachment module of the ERT. In addition, the proposal included two broad circumstances for electronic reporting extensions. A description of the electronic data submission process is provided in the memorandum *Electronic Reporting Requirements for New Source Performance Standards (NSPS) and National Emission Standards for NESHAP Rules*, available in the docket for this action (Docket Item No. EPA-HQ-OAR-2020-0148-0003). The proposed rule

requirements would replace the current rule requirements to submit the NOCS reports, performance test results, and performance evaluation results to the Administrator at the appropriate address listed in 40 CFR 63.13. The proposed rule requirement would not affect submittals required by state air agencies. The proposed compliance date for existing affected sources to comply with the electronic reporting requirements for NOCS reports, performance test results, and performance evaluation results is 181 days after the final rule is published to begin electronic reporting. New affected sources are required to comply with the electronic reporting requirements for NOCS reports, performance test results, and performance evaluation results on the effective date of the standard or upon startup, whichever is later.

2. How did the electronic reporting provisions change for the Refractory Products Manufacturing source category?

No changes were made to the proposed electronic reporting provisions.

3. What key comments did we receive on the electronic reporting provisions and what are our responses?

We received one comment letter that addressed the proposed electronic reporting provisions for refractory products manufacturing. The commenter generally supported the proposed amendments except for the proposed provisions of 40 CFR 63.9814(k) and (l) that would provide instructions for affected sources unable to submit an electronic report either due to a force majeure event or an outage of CEDRI.

4. What is the rationale for our final approach for the electronic reporting requirements?

For the reasons explained in the preamble to the proposed rule (86 FR 3095, January 14, 2021) and the comment summary and response document (available in the docket for this

rulemaking), we are making no changes and are finalizing the electronic reporting provisions as proposed.

F. Technical Amendments for the Refractory Products Manufacturing Source Category

In the final rule, we are amending 40 CFR 63.9824 and Table 4 to subpart SSSSS of part 63, as proposed, to clarify the location in 40 CFR part 60 of applicable EPA test methods. We are also amending 40 CFR 63.9814 and 63.9816 to include the requirements to record and report information on failures to meet the applicable standard.

In the final rule, as proposed, we are adding and updating test methods that are incorporated by reference. In accordance with requirements of 1 CFR part 51.5, the EPA is incorporating by reference the following voluntary consensus standards (VCS) described in the amendments to 40 CFR 63.14:

- ANSI/ASME PTC 19.10-1981, Flue and Exhaust Gas Analyses [Part 10, Instruments and Apparatus], issued August 31, 1981, proposed to be IBR approved for Table 4 to subpart SSSSS. This document specifies methods, apparatus and calculations which are used to determine quantitatively, the gaseous constituents of the exhausts including oxygen and carbon dioxide resulting from station combustions sources.
- ASTM D6348-12e1, Standard Test Method for Determination of Gaseous Compounds by Extractive Direct Interface Fourier Transform Infrared (FTIR) Spectroscopy, Approved February 1, 2012, proposed to be IBR approved for Table 4 to subpart SSSSS.
- ASTM D6784-16, "Standard Test Method for Elemental, Oxidized, Particle-Bound and Total Mercury in Flue Gas Generated from Coal-Fired Stationary Sources (Ontario Hydro Method)," (Approved March 1, 2016), proposed to be IBR approved for Table 4 to subpart SSSSS.

- EPA-454/R-98-015, Office of Air Quality Planning and Standards (OAQPS), Fabric Filter Bag Leak Detection Guidance, September 1997, proposed to be IBR approved for 40 CFR 63.9804(f). This document provides guidance on the use of triboelectric monitors as fabric filter bag leak detectors. The document includes fabric filter and monitoring system descriptions; guidance on monitor selection, installation, setup, adjustment, and operation; and quality assurance procedures.

V. Summary of Cost, Environmental, and Economic Impacts and Additional Analyses Conducted

A. What are the affected facilities?

Currently, three major sources subject to the Refractory Products Manufacturing NESHAP are operating in the United States. The NESHAP applies to each new, reconstructed, and existing affected source located at a refractory products manufacturing facility that is a major source of HAP emissions, is located at a major source of HAP emissions, or is part of a major source of HAP emissions. A refractory products manufacturing facility is a plant site that manufactures refractory products, such as refractory bricks, refractory shapes, monolithics, kiln furniture, crucibles, and other materials used for lining furnaces and other high temperature process units. Refractory products manufacturing facilities typically process raw material by crushing, grinding, and screening; mixing the processed raw materials with binders and other additives; forming the refractory mix into shapes; and drying and firing the shapes. The NESHAP lists the affected sources for four subcategories across the industry as the shape dryers, curing ovens, and kilns that are used to manufacture refractory products that use organic HAP; shape preheaters, pitch working tanks, defumers, and coking ovens that are used to produce pitch-impregnated refractory products; kilns that are used to manufacture chromium refractory

products; and kilns that are used to manufacture clay refractory products. The three major sources currently operating in the U.S. can be grouped into two of the subcategories and use curing ovens and kilns that are used to manufacture nonclay refractory products that use organic HAP and kilns that are used to manufacture clay refractory products.

B. What are the air quality impacts?

At the current level of control, the estimated emissions of HAP from the Refractory Products Manufacturing source category are approximately 40 tpy. The final amendments require that all three major sources in the Refractory Products Manufacturing source category comply with the relevant emission standards at all times, including periods of SSM. The final amendments also limit the number of hours a continuous kiln THC control device can be bypassed during scheduled maintenance and require minimizing emissions of THC during bypass periods. We were unable to quantify the emissions that occur during periods of SSM or the specific emissions reductions that would occur as a result of this action. However, eliminating the SSM exemption has the potential to reduce emissions by requiring facilities to meet the applicable standard during SSM periods. Requiring the use of natural gas as kiln fuel at all times also ensures that PM (as a surrogate for non-Hg metal HAP) and Hg will not be emitted from combustion of coal, fuel oil, or waste-derived fuels.

Indirect or secondary air emissions impacts are impacts that would result from the increased electricity usage associated with the operation of control devices (*e.g.,* increased secondary emissions of criteria pollutants from power plants). Energy impacts consist of the electricity and steam needed to operate control devices and other equipment. The final amendments would have no effect on the energy needs of the affected facilities in this source category and would, therefore, have no indirect or secondary air emissions impacts.

C. What are the cost impacts?

We estimate that each facility in this source category will experience costs as a result of these final amendments. Estimates for reporting and recordkeeping costs for each facility are associated with the electronic reporting requirements, elimination of the SSM exemption, and revision of the requirements that apply during times of scheduled maintenance of continuous kiln control devices. The costs associated with the electronic reporting requirements are attributed to submittal of NOCS reports, performance test results, and performance evaluation results using CEDRI and include time for becoming familiar with CEDRI. The costs associated with the revised SSM requirements were estimated for re-evaluating previously developed SSM record systems. The costs associated with recordkeeping to document the frequency and duration of scheduled maintenance of control devices for continuous kilns were also estimated. The recordkeeping and reporting costs are presented in section VI.C of this preamble.

We estimate the costs associated with this action are primarily due to the new compliance testing requirements for the clay refractory kilns in this action. Two of the major source refractory manufacturing facilities manufacture clay refractory and are required to conduct periodic compliance testing for PM as a surrogate for non-Hg metal HAP and Hg once every 5 years. One clay refractory manufacturing facility has two continuous kilns and the other has two continuous kilns and three batch kilns. The costs associated with conducting the combined PM and Hg test for each continuous kiln stack are estimated to be about $23,600. The costs associated with conducting the combined PM and Hg test for each batch kiln stack are estimated to be about $31,800. We also assumed that tests for additional stacks at the same facility would be conducted in the same trip, so the additional cost is less due to reduced travel costs. The total costs for the two facilities to test the seven kilns in a single year would be $115,300. In addition

to the testing costs, each facility performing the testing will have an additional $6,900 in reporting costs per facility in the year in which the test occurs.

For kilns that meet the limits without any controls, owners or operators are required to conduct VE monitoring to demonstrate compliance. One of the continuous kilns is controlled with a wet scrubber, but the other six kilns are expected to need to conduct VE monitoring. We estimate that the monitoring will cost $3,740 per year per stack, for a total of $22,400 per year.

For further information on the potential testing and monitoring costs, see the memorandum titled *Development of Proposed Standards and Impacts for the Refractory Products Manufacturing NESHAP*, located in the docket for this action (Docket Item No. EPA-HQ-OAR-2020-0148-0014).

D. What are the economic impacts?

The economic impact analysis is designed to inform decision makers about the potential economic consequences of the compliance costs outlined in section V.C of this preamble. To assess the maximum potential impact, the largest cost expected to be experienced in any one year is compared to the total sales for the ultimate owner of the affected facilities to estimate the total burden for each owner. For these final amendments, the total cost of testing, monitoring, and recordkeeping and reporting is estimated to be $158,140. The total annual costs associated with the requirements range from 0.00008 to 0.18 percent of annual sales revenue per ultimate owner. These costs are not expected to result in a significant market impact, regardless of whether they are passed on to customers or absorbed by the firms.

The EPA also prepared a small business screening assessment to determine whether any of the identified affected facilities are small entities, as defined by the U.S. Small Business Administration. One of the facilities affected by these amendments is a small entity. However,

the annual cost associated with the requirements is 0.18 percent of annual sales revenue for the owner of that facility. Therefore, there are no significant economic impacts on a substantial number of small entities from these amendments.

E. What are the benefits?

As stated above in section V.B. of this preamble, we were unable to quantify the specific emissions reductions associated with eliminating the SSM exemption, although this change has the potential to reduce emissions of volatile organic HAP.

Because these final amendments are not considered economically significant, as defined by Executive Order 12866, we did not monetize the benefits of reducing these emissions. This does not mean that there are no benefits associated with the potential reduction in volatile organic HAP from this rule.

F. What analysis of environmental justice did we conduct?

Executive Order 12898 directs the EPA to identify the populations of concern who are most likely to experience unequal burdens from environmental harms; specifically, minority populations, low-income populations, and indigenous peoples (59 FR 7629, February 16, 1994). Additionally, Executive Order 13985 was signed to advance racial equity and support underserved communities through Federal government actions (86 FR 7009, January 20, 2021). The EPA defines environmental justice (EJ) as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The EPA further defines the term fair treatment to mean that "no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or

programs and policies" (*https://www.epa.gov/environmentaljustice*). In recognizing that minority and low-income populations often bear an unequal burden of environmental harms and risks, the EPA continues to consider ways of protecting them from adverse public health and environmental effects of air pollution.

Based on an analysis of exposed populations, the EPA determined that the Refractory Products Manufacturing source category does not pose a disproportionately high adverse health impact on minority populations and/or low-income populations, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994) and referenced in Executive Order 13985 (86 FR 7009, January 20, 2021). The EPA remains committed to engaging with communities and stakeholders throughout the development of air pollution regulations.

To examine the potential for any environmental justice issues that might be associated with this source category, we performed a demographic analysis, which is an assessment of risks to individual demographic groups of the populations living within 5 km and within 50 km of the facilities. In the analysis, we also evaluated the distribution of HAP-related cancer and noncancer risks from the Refractory Products Manufacturing source category across different demographic groups within the populations living near facilities.[3]

The results of the demographic analysis for the Refractory Products Manufacturing source category indicates that no one is exposed to a cancer risk at or above 1-in-1 million or to a chronic noncancer TOSHI greater than 1. In addition, no percentages of the populations exposed to emissions from the source category are higher than their respective nationwide average

[3] Demographic groups included in the analysis are: White, African American, Native American, other races and multiracial, Hispanic or Latino, children 17 years of age and under, adults 18 to 64 years of age, adults 65 years of age and over, adults without a high school diploma, people living below the poverty level, people living two times the poverty level, and linguistically isolated people.

percentages. Thus, the populations living near refractory products manufacturing facilities are similar to the national average in demographic characteristics, and we do not see a disproportionately high exposure to the population groups indicated in the Executive Orders. The methodology and the results of the demographic analysis are presented in more detail in the technical report titled *Risk and Technology Review – Analysis of Demographic Factors for Populations Living Near Refractory Products Manufacturing Source Category Operations*, September 2020, available in the docket for this action (Docket Item No. EPA-HQ-OAR-2020-0148-0007).

G. What analysis of children's environmental health did we conduct?

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because the EPA does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. This action's health and risk assessments are contained in section IV.A of this preamble and are further documented in the *Residual Risk Assessment for the Refractory Products Manufacturing Source Category in Support of the 2020 Risk and Technology Review Proposed Rule*, available in the Refractory Products Manufacturing docket (Docket Item No. EPA-HQ-OAR-2020-0148-0013).

VI. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at *https://www.epa.gov/laws-regulations/laws-and-executive-orders*.

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

This action is not a significant regulatory action and was, therefore, not submitted to OMB for review.

B. Paperwork Reduction Act (PRA)

The information collection activities in this action have been submitted for approval to OMB under the PRA. The Information Collection Request (ICR) document that the EPA prepared has been assigned EPA ICR number 2040.08. You can find a copy of the ICR in the Refractory Products Manufacturing Docket (Docket ID No. EPA-HQ-OAR-2020-0148), and it is briefly summarized here.

As part of the RTR for the Refractory Products Manufacturing NESHAP, the EPA is not revising the existing emission limit requirements but is adding new emission limit requirements for existing clay refractory sources and is adding new work practices for existing nonclay refractory sources. The EPA is also revising the SSM provisions of the rule and is adding the use of electronic data reporting for future performance test result and performance evaluation result submittals, and NOCS reports. This information is being collected to assure compliance with 40 CFR part 63, subpart SSSSS.

Respondents/affected entities: Facilities manufacturing refractory products.

Respondent's obligation to respond: Mandatory (40 CFR part 63, subpart SSSSS).

Estimated number of respondents: In the 3 years after the amendments are final, approximately three respondents per year will be subject to the NESHAP and no additional respondents are expected to become subject to the NESHAP during that period.

Frequency of response: The total number of responses is 15 per year.

Total estimated burden: The average annual burden to the three refractory products manufacturing facilities over the 3 years after the amendments are final is estimated to be 230 hours (per year). The average annual burden to the Agency over the 3 years after the amendments are final is estimated to be 202 hours (per year). Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: The average annual cost to the refractory products manufacturing facilities is $27,100 in labor costs in the first 3 years after the amendments are final. The average annual capital and operation and maintenance (O&M) cost is $69,900. The total average annual Agency cost over the first 3 years after the amendments are final is estimated to be $9,990.

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

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. The annualized costs associated with the requirements in this action for the affected small entities is described in section V.C. above.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. While this action creates an enforceable duty on the private sector, the cost does not exceed $100 million or more.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

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

This action does not have tribal implications as specified in Executive Order 13175. No tribal facilities are known to be engaged in any of the industries that would be affected by this action. In addition, the EPA conducted a proximity analysis for this source category and found that no refractory products manufacturing facilities are located within 50 miles of tribal lands. Thus, Executive Order 13175 does not apply to this action.

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

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because the EPA does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. This action's health and risk assessments are contained in section IV.A of this preamble and are further documented in the Refractory Products Manufacturing Docket.

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

This action is not subject to Executive Order 13211 because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act and 1 CFR part 51

This action involves technical standards. The EPA amended the Refractory Products Manufacturing NESHAP in this action with two methods that can be used as alternatives to the EPA methods in the current NESHAP: ANSI/ASME PTC 19.10–1981, "Flue and Exhaust Gas Analyses" and ASTM D6348-12e1, "Determination of Gaseous Compounds by Extractive Direct Interface Fourier Transform (FTIR) Spectroscopy". The EPA also amended the Refractory Products Manufacturing NESHAP in this action with two new methods: EPA Method 29 (portion for Hg only) and alternative method ASTM D6784-16, "Standard Test Method for Elemental, Oxidized, Particle-Bound and Total Mercury in Flue Gas Generated from Coal-Fired Stationary Sources (Ontario Hydro Method)". The EPA also added new guidance to the NESHAP: EPA-454/R-98-015, Office of Air Quality Planning and Standards (OAQPS), Fabric Filter Bag Leak Detection Guidance, September 1997. The methods and guidance will be incorporated by reference as described below.

The EPA is incorporating by reference the VCS ANSI/ASME PTC 19.10–1981, "Flue and Exhaust Gas Analyses." This method determines quantitatively the gaseous constituents of exhausts resulting from stationary combustion sources. The manual procedures (but not instrumental procedures) of VCS ANSI/ASME PTC 19.10-1981—Part 10 may be used as an alternative to EPA Method 3B for measuring the oxygen or carbon dioxide content of the exhaust gas. The gases covered in ANSI/ASME PTC 19.10–1981 are oxygen, carbon dioxide, carbon monoxide, nitrogen, sulfur dioxide, sulfur trioxide, nitric oxide, nitrogen dioxide, hydrogen sulfide, and hydrocarbons, however the use in this rule is only applicable to oxygen and carbon dioxide and is an acceptable alternative to the manual portion only and not the instrumental portion.

The EPA is incorporating by reference the VCS ASTM D6348-12e1, "Determination of Gaseous Compounds by Extractive Direct Interface Fourier Transform (FTIR) Spectroscopy" as an acceptable alternative to EPA Method 320. ASTM D6348-03(2010) was determined to be equivalent to EPA Method 320 with caveats. ASTM D6348-12e1 is a revised version of ASTM D6348-03(2010) and includes a new section on accepting the results from the direct measurement of a certified spike gas cylinder, but lacks the caveats placed on the D6348-03(2010) version. The VCS ASTM D6348-12e1 "Determination of Gaseous Compounds by Extractive Direct Interface Fourier Transform (FTIR) Spectroscopy" is an extractive FTIR field test method used to quantify gas phase concentrations of multiple analytes from stationary source effluent and is an acceptable alternative to EPA Method 320 at this time with caveats requiring inclusion of selected annexes to the standard as mandatory. When using ASTM D6348-12e1, the following conditions must be met:

(1) The test plan preparation and implementation in the Annexes to ASTM D6348-03, sections A1 through A8 are mandatory; and

(2) In ASTM D6348-03 Annex A5 (Analyte Spiking Technique), the percent (%) R must be determined for each target analyte (Equation A5.5).

In order for the test data to be acceptable for a compound, %R must be $70\% \geq R \leq 130\%$. If the %R value does not meet this criterion for a target compound, the test data is not acceptable for that compound and the test must be repeated for that analyte (*i.e.*, the sampling and/or analytical procedure should be adjusted before a retest). The %R value for each compound must be reported in the test report, and all field measurements must be corrected with the calculated %R value for that compound by using the following equation: Reported Results = ((Measured Concentration in Stack))/(%R) x 100.

The EPA is also incorporating by reference the VCS ASTM D6784-16, "Standard Test Method for Elemental, Oxidized, Particle-Bound and Total Mercury in Flue Gas Generated from Coal-Fired Stationary Sources (Ontario Hydro Method)" as an acceptable alternative to EPA Method 29 (portion for Hg only) as a method for measuring elemental, oxidized, particle-bound, and total Hg concentrations ranging from approximately 0.5 – 100 micrograms per normal cubic meter ($\mu g/Nm^3$). This test method describes equipment and procedures for obtaining samples from effluent ducts and stacks, equipment and procedures for laboratory analysis, and procedures for calculating results. VCS ASTM D6784-16 allows for additional flexibility in the sampling and analytical procedures for the earlier version of the same standard VCS ASTM D6784-02 (Reapproved 2008).

The EPA is also incorporating by reference EPA-454/R-98-015, Office of Air Quality Planning and Standards (OAQPS), Fabric Filter Bag Leak Detection Guidance, September 1997, IBR for 40 CFR 63.9804(f). This document provides guidance on the use of triboelectric monitors as fabric filter bag leak detectors and includes fabric filter and monitoring system descriptions; guidance on monitor selection, installation, setup, adjustment, and operation; and quality assurance procedures.

Guidance document EPA-454/R-98-015 and ASTM D6784-16 are available electronically through *https://www.regulations.gov/* and/or in hard copy at the appropriate EPA office (see the **ADDRESSES** section of this preamble for more information). The ANSI/ASME document (ANSI/ASME PTC 19.10–1981) is available from the American Society of Mechanical Engineers (ASME) at *http://www.asme.org*; by mail at Three Park Avenue, New York, NY 10016-5990; or by telephone at (800) 843-2763. The ASTM methods are available

from ASTM International at *https://www.astm.org*; by mail at 100 Barr Harbor Drive, Post Office Box C700, West Conshohocken, PA 19428-2959; or by telephone at (610) 832-9585.

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

The EPA believes that this action does not have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, and/or indigenous peoples, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994). The documentation for this decision is contained in the technical report titled *Risk and Technology Review – Analysis of Demographic Factors for Populations Living Near Refractory Products Manufacturing Source Category Operations*, September 2020, available in the Refractory Products Manufacturing Docket for this action (Docket Item No. EPA-HQ-OAR-2020-0148-0007).

The EPA provided opportunities to engage with the EPA on this action. The Agency offered a public hearing and reached out to communities in other ways, including meetings to exchange information with stakeholders about this action. We did not receive a request for a public hearing, and we did not receive feedback regarding EJ during the meetings.

K. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a "major rule" as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR part 63

Environmental protection, Administrative practice and procedures, Air pollution control, Hazardous substances, Incorporation by reference, Intergovernmental relations, Reporting and recordkeeping requirements.

_____.
Dated:

_____
Michael S. Regan,

Administrator.

For the reasons set out in the preamble, 40 CFR part 63 is amended as follows:

PART 63—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES

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

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

Subpart A—General Provisions

2. Section 63.14 is amended by:

a. Revising paragraphs (e)(1) and (h)(86);

b. Redesignating paragraphs (h)(104) through (118) as paragraphs (h)(105) through (119);

c. Adding new paragraph (h)(104); and

d. Revising paragraph (n)(4).

The revisions and additions read as follows:

§63.14 Incorporations by reference.

* * * * *

(e) * * *

(1) ANSI/ASME PTC 19.10-1981, Flue and Exhaust Gas Analyses [Part 10, Instruments and Apparatus], issued August 31, 1981, IBR approved for §§63.309(k), 63.457(k), 63.772(e) and (h), 63.865(b), 63.997(e), 63.1282(d) and (g), and 63.1625(b), table 5 to subpart EEEE, §§63.3166(a), 63.3360(e), 63.3545(a), 63.3555(a), 63.4166(a), 63.4362(a), 63.4766(a), 63.4965(a), and 63.5160(d), table 4 to subpart UUUU, table 3 to subpart YYYY, §§63.7822(b), 63.7824(e), 63.7825(b), 63.8000(d), 63.9307(c), 63.9323(a), 63.9621(b) and (c), 63.11148(e), 63.11155(e), 63.11162(f), 63.11163(g), 63.11410(j), 63.11551(a), 63.11646(a), and 63.11945, and table 4 to subpart AAAAA, table 5 to subpart DDDDD, table 4 to subpart JJJJJ, table 4 to

subpart KKKKK, table 4 to subpart SSSSS, tables 4 and 5 of subpart UUUUU, table 1 to subpart ZZZZZ, and table 4 to subpart JJJJJJ.

* * * * *

(h) * * *

(86) ASTM D6348-12e1, Standard Test Method for Determination of Gaseous Compounds by Extractive Direct Interface Fourier Transform Infrared (FTIR) Spectroscopy, Approved February 1, 2012, IBR approved for §§63.997(e), 63.1571(a), and 63.2354(b), table 5 to subpart EEEE, table 4 to subpart UUUU, §§63.7142(a) and (b) and 63.8000(d), and table 4 to subpart SSSSS.

* * * * *

(104) ASTM D6784-16, Standard Test Method for Elemental, Oxidized, Particle-Bound and Total Mercury in Flue Gas Generated from Coal-Fired Stationary Sources (Ontario Hydro Method), Approved March 1, 2016, IBR approved for table 4 to subpart SSSSS.

* * * * *

(n) * * *

(4) EPA-454/R-98-015, Office of Air Quality Planning and Standards (OAQPS), Fabric Filter Bag Leak Detection Guidance, September 1997, *https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=2000D5T6.PDF*, IBR approved for §§63.548(e), 63.864(e), 63.7525(j), 63.8450(e), 63.8600(e), 63.9632(a), 63.9804(f), and 63.11224(f).

* * * * *

Subpart SSSSS—National Emission Standards for Hazardous Air Pollutants for Refractory Products Manufacturing

3. Section 63.9786 is amended by revising paragraphs (a), (b), and (d)(2) to read as follows:

§63.9786 When do I have to comply with this subpart?

(a) If you have a new or reconstructed affected source, you must comply with this subpart according to paragraphs (a)(1) and (2) of this section.

(1) If the initial startup of your affected source is before April 16, 2003, then you must comply with the emission limitations for new and reconstructed sources in this subpart no later than April 16, 2003, except as otherwise specified in §§63.9792, 63.9812(c) and (e), and 63.9814(b)(6) and Tables 1 through 11 to this subpart.

(2) If the initial startup of your affected source is after April 16, 2003, then you must comply with the emission limitations for new and reconstructed sources in this subpart upon initial startup of your affected source, except as otherwise specified in §§63.9792, 63.9812(c) and (e), and 63.9814(b)(6) and Tables 1 through 11 to this subpart.

(b) If you have an existing affected source, you must comply with the emission limitations for existing sources no later than April 17, 2006, except as otherwise specified in §§63.9792, 63.9812(c) and (e), and 63.9814(b)(6) and Tables 1 through 11 to this subpart.

* * * * *

(d) * * *

(2) All other parts of the existing facility must be in compliance with this subpart by 3 years after the date the area source becomes a major source, except as otherwise specified in §§63.9792, 63.9812(c) and (e), and 63.9814(b)(6) and Tables 1 through 11 to this subpart.

* * * * *

4. Section 63.9792 is amended by revising paragraph (a) introductory text, paragraphs (b) and (c), paragraph (e) introductory text, and paragraphs (e)(2) and (3) to read as follows:

§63.9792 What are my general requirements for complying with this subpart?

(a) You must be in compliance with the emission limitations (including operating limits and work practice standards) in this subpart at all times, except during periods specified in paragraphs (a)(1) and (2) of this section before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. You must be in compliance with the emission limitations (including operating limits and work practice standards) in this subpart at all times, on or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

* * * * *

(b) Except as specified in paragraph (e) of this section, before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you must always operate and maintain your affected source, including air pollution control and monitoring equipment, according to the provisions in §63.6(e)(1)(i). During the period between the compliance date specified for your affected source in §63.9786 and the date upon which continuous monitoring systems have been installed and validated and any applicable operating limits have been established, you must maintain a log detailing the operation and maintenance of the process and emissions control equipment. On and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, at all times, you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control

practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by the applicable standard have been achieved. Determination of whether a source is operating in compliance with operation and maintenance requirements will be based on information available to the Administrator that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the affected source.

(c) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you must develop a written startup, shutdown, and malfunction plan (SSMP) according to the provisions in §63.6(e)(3). On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you are not required to develop a written SSMP according to the provisions in §63.6(e)(3).

* * * * *

(e) If you own or operate an affected continuous kiln used to manufacture refractory products that use organic HAP and you must perform scheduled maintenance on the THC control device for that kiln, you may bypass the kiln THC control device and continue operating the kiln subject to the alternative standard established in this paragraph upon approval by the Administrator, provided you satisfy the conditions listed in paragraphs (e)(1) through (3) of this section.

* * * * *

(2) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you must minimize HAP emissions during the period when the kiln is operating, and the control device is out of service. On and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you must minimize

HAP emissions during the period when the kiln is operating and the control device is out of service by complying with the applicable standard in Table 3 to this subpart.

(3) You must minimize the time period during which the kiln is operating and the control device is out of service. On and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the total time during which the kiln is operating and the control device is out of service for each year on a 12-month rolling basis must not exceed 750 hours.

* * * * *

5. Section 63.9794 is amended by revising paragraphs (a)(7), (8), (12), and (13) and paragraph (b)(2) to read as follows:

§63.9794 What do I need to know about operation, maintenance, and monitoring plans?

(a) * * *

(7) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, procedures for the proper operation and maintenance of monitoring equipment consistent with the requirements in §§63.8(c)(1), (3), (4)(ii), (7), and (8), and 63.9804. On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, procedures for the proper operation and maintenance of monitoring equipment consistent with the requirements in §§63.8(c)(3), (4)(ii), (7), and (8), and 63.9804.

(8) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, ongoing data quality assurance procedures in accordance with the general requirements of §63.8(d). On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, ongoing data quality assurance

procedures consistent with the requirements in §63.8(d)(1) and (2). You must keep these written procedures on record for the life of the affected source or until the affected source is no longer subject to the provisions of this part, to be made available for inspection, upon request, by the Administrator. If the performance evaluation plan in §63.8(d)(2) is revised, you must keep previous (*i.e.*, superseded) versions of the performance evaluation plan on record to be made available for inspection, upon request, by the Administrator, for a period of 5 years after each revision to the plan. The program of corrective action should be included in the plan required under §63.8(d)(2).

* * * * *

(12) Before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, if you operate a kiln that is subject to the limits on the type of fuel used, as specified in items 3 and 4 of Table 3 to subpart SSSSS, procedures for using alternative fuels. On and after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you may not use a fuel other than natural gas or equivalent to fire the affected kiln.

(13) If you operate an affected continuous kiln used to manufacture refractory products that use organic HAP and you plan to take the kiln THC control device out of service for scheduled maintenance, as specified in §63.9792(e), the procedures specified in paragraphs (a)(13)(i) and (ii) of this section.

(i) Procedures for minimizing HAP emissions from the kiln during periods of scheduled maintenance of the kiln control device when the kiln is operating and the control device is out of service. On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, document the average organic HAP processing rate for that kiln (*i.e.*, the average organic HAP processing rate based on (a) the actual production on a 6-month

rolling basis (not to include periods of kiln shut down) or (b) the HAP processing rate (lb/hr) that coincides with the lowest hour of the most recent 3-hour performance test, whichever is lower), the mass fraction of organic HAP in the resins, binders, and additives for each product manufactured in the kiln and procedures for ensuring that the actual organic HAP processing rate on an hourly basis does not exceed the average organic HAP processing rate.

(ii) Procedures for minimizing any period of scheduled maintenance on the kiln control device when the kiln is operating and the control device is out of service. On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, procedures for ensuring that the total time during which the kiln is operating and the control device is out of service does not exceed 750 hours for each year on a 12-month rolling basis.

(b) * * *

(2) After completing the performance tests to demonstrate that compliance with the emission limits can be achieved at the revised operating limit parameter value, you must submit the summary of the performance test results and the revised operating limits as part of the Notification of Compliance Status required under §63.9(h) and the complete test report according to §63.9814(h).

* * * * *

6. Section 63.9800 is amended by revising paragraphs (c) and (d) and paragraph (g) introductory text and adding paragraph (g)(4) to read as follows:

§63.9800 How do I conduct performance tests and establish operating limits?

* * * * *

(c) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, each performance test must be conducted according to the

requirements in §63.7 and under the specific conditions in Table 4 to this subpart. On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, each performance test must be conducted under the specific conditions in Table 4 to this subpart.

(d) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you may not conduct performance tests during periods of startup, shutdown, or malfunction, as specified in §63.7(e)(1). On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you may not conduct performance tests during periods of malfunction. You also may not conduct performance tests during periods of startup or shutdown. You must record the process information that is necessary to document operating conditions during the test and include in such record an explanation to support that such conditions represent normal operation. You must make available to the Administrator such records as may be necessary to determine the conditions of performance tests.

* * * * *

(g) You must use the data gathered during the performance test and the equations in paragraphs (g)(1) through (4) of this section to determine compliance with the emission limitations.

* * * * *

(4) To determine compliance with the Hg emission concentration limit listed in Table 1 to this subpart, you must calculate your emission concentration corrected to 18 percent oxygen for each test run using Equation 4 of this section:

$$C_{Hg\text{-}C} = \frac{2.9 \times C_{Hg}}{(20.9 - C_{O_2})} \qquad \text{(Eq. 4)}$$

Where:

$C_{Hg\text{-}C}$ = Hg concentration, corrected to 18 percent oxygen, micrograms per dry standard cubic meters (µg/dscm)

C_{Hg} = Hg concentration (uncorrected), µg/dscm

C_{O2} = oxygen concentration, percent.

* * * * *

7. Section 63.9804 is amended by revising paragraphs (a)(13), (e)(1), and (f)(1) to read as follows:

§63.9804 What are my monitoring system installation, operation, and maintenance requirements?

(a) * * *

(13) At all times, you must maintain your CPMS in accordance with §63.9792(b), including, but not limited to, keeping the necessary parts readily available for routine repairs of the CPMS.

* * * * *

(e) * * *

(1) Use a pH CPMS with a minimum accuracy of ±0.2 pH units.

* * * * *

(f) * * *

(1) Each triboelectric bag leak detection system must be installed, calibrated, operated, and maintained according to the "Fabric Filter Bag Leak Detection Guidance" (EPA-454/R-98-015, September 1997) (incorporated by reference, see §63.14). Other types of bag leak detection

systems must be installed, operated, calibrated, and maintained in a manner consistent with the manufacturer's written specifications and recommendations.

* * * * *

8. Section 63.9806 is amended by revising paragraph (d) to read as follows:

§63.9806 How do I demonstrate initial compliance with the emission limits, operating limits, and work practice standards?

* * * * *

(d) You must submit the Notification of Compliance Status containing the results of the initial compliance demonstration according to the requirements in §63.9812(e). After **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]** for affected sources that commence construction or reconstruction after **January 14, 2021**, and on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** for all other affected sources, you must submit the Notification of Compliance Status containing the results of the initial compliance demonstration according to the requirements in §63.9812(e) and 63.9814(j).

9. Section 63.9808 is amended by revising paragraph (b) to read as follows:

§63.9808 How do I monitor and collect data to demonstrate continuous compliance?

* * * * *

(b) At all times, you must maintain your monitoring systems in accordance with §63.9792(b), including, but not limited to, keeping the necessary parts readily available for routine repairs of the monitoring equipment.

* * * * *

10. Section 63.9810 is amended by revising paragraph (e) and adding paragraph (f) to read as follows:

§63.9810 How do I demonstrate continuous compliance with the emission limits, operating limits, and work practice standards?

* * * * *

(e) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you must report each instance in which you did not meet each emission limit and each operating limit in this subpart that applies to you. This includes periods of SSM. These instances are deviations from the emission limitations in this subpart. These deviations must be reported according to the requirements in §63.9814. On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you must report each instance in which you did not meet each emission limit and each operating limit in this subpart that applies to you. These instances are deviations from the emission limitations in this subpart. These deviations must be reported according to the requirements in §63.9814.

(1) [Reserved]

(2) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, consistent with §§63.6(e) and 63.7(e)(1), deviations that occur during a period of startup, shutdown, or malfunction are not violations if you demonstrate to the Administrator's satisfaction that you were operating in accordance with §63.6(e)(1) and your OM&M plan. The Administrator will determine whether deviations that occur during a period of startup, shutdown, or malfunction are violations, according to the provisions in §63.6(e). On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL**

REGISTER], consistent with §§63.9792(b) and 63.9800(d), deviations are not violations if you demonstrate to the Administrator's satisfaction that you were operating in accordance with §63.9792(b) and your OM&M plan. The Administrator will determine whether deviations are violations, according to the provisions in §63.9792(b).

(f) You must demonstrate continuous compliance with the operating limits in Table 2 to this subpart for visible emissions (VE) from clay refractory products kilns that are uncontrolled or equipped with DLA, dry lime injection fabric filter (DIFF), dry lime scrubber/fabric filter (DLS/FF) or other dry control device as described in paragraph (f)(1) or (2) of this section.

(1) *VE testing*. Monitoring VE at each kiln stack according to the requirements in paragraphs (f)(1)(i) through (v) of this section.

(i) Perform daily VE observations of each kiln stack according to the procedures of EPA Method 22 of 40 CFR part 60, appendix A-7. You must conduct the EPA Method 22 test while the affected source is operating under normal conditions. The duration of each EPA Method 22 test must be at least 15 minutes.

(ii) If VE are observed during any daily test conducted using EPA Method 22 of 40 CFR part 60, appendix A-7, you must promptly conduct an opacity test, according to the procedures of EPA Method 9 of 40 CFR part 60, appendix A-4. If opacity greater than 10 percent is observed, you must initiate and complete corrective actions according to your OM&M plan.

(iii) You may decrease the frequency of EPA Method 22 testing from daily to weekly for a kiln stack if one of the conditions in paragraph (f)(1)(iii)(A) or (B) of this section is met.

(A) No VE are observed in 30 consecutive daily EPA Method 22 tests for any kiln stack; or

(B) No opacity greater than 10 percent is observed during any of the EPA Method 9 tests for any kiln stack.

(iv) If VE are observed during any weekly test and opacity greater than 10 percent is observed in the subsequent EPA Method 9 test, you must promptly initiate and complete corrective actions according to your OM&M plan, resume testing of that kiln stack following EPA Method 22 of 40 CFR part 60, appendix A-7, on a daily basis, as described in paragraph (f)(1)(i) of this section, and maintain that schedule until one of the conditions in paragraph (f)(1)(iii)(A) or (B) of this section is met, at which time you may again decrease the frequency of EPA Method 22 testing to a weekly basis.

(v) If greater than 10 percent opacity is observed during any test conducted using EPA Method 9 of 40 CFR part 60, appendix A-4, you must report these deviations by following the requirements in §63.9814.

(2) *Alternative to VE testing*. In lieu of meeting the requirements under paragraph (f)(1) of this section, you may conduct a PM test at least once every year following the initial performance test, according to the procedures of EPA Method 5 of 40 CFR part 60, appendix A-3, and the provisions of §63.9800(e) and (f).

11. Section 63.9812 is amended by revising paragraphs (b) and (c), paragraph (e) introductory text, paragraph (e)(1), paragraph (f) introductory text, and paragraph (g) to read as follows:

§63.9812 What notifications must I submit and when?

* * * * *

(b) As specified in §63.9(b)(2) and (3), if you start up your affected source before April 16, 2003, you must submit an Initial Notification not later than 120 calendar days after April 16,

2003, or no later than 120 days after the source becomes subject to this subpart, whichever is later.

(c) As specified in §63.9(b)(3), if you start up your new or reconstructed affected source on or after April 16, 2003, you must submit an Initial Notification not later than 120 calendar days after you become subject to this subpart. Initial Notifications required to be submitted after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]** for affected sources that commence construction or reconstruction after **January 14, 2021**, and on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** for all other affected sources submitting initial notifications required in §63.9(b) must be submitted following the procedure specified in §63.9814(h) through (l).

* * * * *

(e) If you are required to conduct a performance test, you must submit a Notification of Compliance Status as specified in §63.9(h) and paragraphs (e)(1) and (2) of this section. After **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]** for affected sources that commence construction or reconstruction after **January 14, 2021**, and on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** for all other affected sources, submit all subsequent Notifications of Compliance Status following the procedure specified in §63.9814(h) through (l).

(1) For each compliance demonstration that includes a performance test conducted according to the requirements in Table 4 to this subpart, you must submit the Notification of Compliance Status, including the summary of the performance test results, before the close of business on the 60th calendar day following the completion of the performance test.

* * * * *

(f) Before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, if you operate a clay refractory products kiln or a chromium refractory products kiln that is subject to the work practice standard specified in item 3 or 4 of Table 3 to this subpart, and you intend to use a fuel other than natural gas or equivalent to fire the affected kiln, you must submit a notification of alternative fuel use within 48 hours of the declaration of a period of natural gas curtailment or supply interruption, as defined in §63.9824. The notification must include the information specified in paragraphs (f)(1) through (5) of this section. On and after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you may not use a fuel other than natural gas or equivalent to fire the affected kiln.

* * * * *

(g) If you own or operate an affected continuous kiln used to manufacture refractory products that use organic HAP and must perform scheduled maintenance on the THC control device for that kiln, you must request approval from the Administrator before bypassing the control device, as specified in §63.9792(e). You must submit a separate request for approval each time you plan to bypass the kiln control device.

12. Section 63.9814 is amended by:

a. Revising paragraph (c) introductory text and paragraph (c)(4);

b. Adding paragraph (c)(7);

c. Revising paragraphs (d) and (e) and paragraph (g) introductory text; and

d. Adding paragraphs (h) through (l).

The revisions and additions read as follows:

§63.9814 What reports must I submit and when?

* * * * *

(c) The compliance report must contain the information in paragraphs (c)(1) through (7) of this section.

* * * * *

(4) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, if you had a startup, shutdown, or malfunction during the reporting period, and you took actions consistent with your SSMP and OM&M plan, the compliance report must include the information specified in §63.10(d)(5)(i). On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, if you had a deviation from any emission limitations (emission limit, operating limit, or work practice standard) during the reporting period that apply to you, and you took actions consistent with your OM&M plan, the compliance report must include the information specified in (d) and (e) of this section.

* * * * *

(7) For each period when an affected continuous kiln used to manufacture refractory products that use organic HAP was operating while the THC control device was out of service, the compliance report must include a description of the control device maintenance performed, including the information specified in paragraphs (c)(7)(i) through (vi) of this section.

(i) The date and time when the control device was shut down and restarted.

(ii) Identification of the kiln that was operating and the number of hours that the kiln operated while the control device was out of service.

(iii) A statement of whether or not the control device maintenance was included in your approved request to bypass the control device while scheduled maintenance is performed, developed as specified in §63.9792(e).

(iv) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, a statement of whether emissions were minimized while the control device was out of service in accordance with your OM&M plan. After **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, a statement of whether emissions were minimized while the control device was out of service in accordance with your OM&M plan and the information specified in paragraphs (c)(7)(iv)(A) through (C) of this section.

(A) The average organic HAP processing rate based on actual production on a 6-month rolling basis (not to include periods of kiln shut down) or the lowest hourly organic HAP processing rate from the most recent performance test on that kiln, whichever is lower.

(B) The actual hourly organic HAP processing rate for the kiln while the control device was out of service.

(C) The amount of product manufactured and the mass of organic HAP in the product manufactured in the kiln while the control device was out of service.

(v) After **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, an estimate of the THC emissions from the continuous kiln stack while the control device was out of service.

(vi) After **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the total number of hours that the kiln has operated while the control device was out of service during the last year on a 12-month rolling basis.

(d) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, for each deviation from an emission limitation (emission limit, operating limit, or work practice standard) that occurs at an affected source where you are not

using a CPMS to comply with the emission limitations in this subpart, the compliance report must contain the information in paragraphs (c)(1) through (4) and (d)(1) and (2) of this section. This includes periods of SSM. On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, for each deviation from an emission limitation (emission limit, operating limit, or work practice standard) that occurs at an affected source where you are not using a CPMS to comply with the emission limitations in this subpart, the compliance report must contain the information in paragraphs (c)(1) through (4) and (d)(1) through (3) of this section.

(1) The compliance report must include the total operating time of each affected source during the reporting period.

(2) The compliance report must include information on the number, duration in hours, and cause of deviations (including unknown cause, if applicable) and the corrective action taken.

(3) The compliance report must include the date and time of each deviation, a list of the affected sources or equipment, and an estimate of each regulated pollutant emitted over the emission limit and a description of the method used to estimate the emissions.

(e) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, for each deviation from an emission limitation (emission limit, operating limit, or work practice standard) occurring at an affected source where you are using a CPMS to comply with the emission limitation in this subpart, the compliance report must include the information in paragraphs (c)(1) through (4) and (e)(1) through (13) of this section. This includes periods of SSM. On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, for each deviation from an emission limitation (emission limit, operating limit, or work practice standard) occurring at an affected

source where you are using a CPMS to comply with the emission limitation in this subpart, the compliance report must include the information in paragraphs (c)(1) through (4) and (e)(1) through (13) of this section.

(1) The total operating time of each affected source during the reporting period.

(2) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the date and time that each startup, shutdown, or malfunction started and stopped. On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the date and time that each startup, shutdown, or malfunction started and stopped is not required.

(3) The date, time, and duration in hours that each CPMS was inoperative.

(4) The date, time and duration in hours that each CPMS was out of control, including the information in §63.8(c)(8), as required by your OM&M plan.

(5) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the date and time that each deviation from an emission limitation (emission limit, operating limit, or work practice standard) started and stopped, and whether each deviation occurred during a period of startup, shutdown, or malfunction. On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, for each deviation from an emission limitation (emission limit, operating limit, or work practice standard), the date and time that each deviation started and stopped, the duration in hours, a list of the affected sources or equipment, an estimate of each regulated pollutant emitted over the emission limit, and a description of the method used to estimate the emissions.

(6) A description of corrective action taken in response to a deviation.

(7) The total number of deviations during the reporting period, a summary of the total duration in hours of the deviations during the reporting period, and the total duration as a percentage of the total source operating time during that reporting period.

(8) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, a breakdown of the total duration of the deviations during the reporting period into those that are due to startup, shutdown, control equipment problems, process problems, other known causes, and other unknown causes. On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, a breakdown of the total duration of the deviations during the reporting period into those that are due to control equipment problems, process problems, other known causes, and other unknown causes.

(9) A summary of the total duration in hours of CPMS downtime during the reporting period and the total duration of CPMS downtime as a percentage of the total source operating time during that reporting period.

(10) A brief description of the process units.

(11) A brief description of the CPMS.

(12) The date of the latest CPMS initial validation or accuracy audit.

(13) A description of any changes in CPMS, processes, or controls since the last reporting period.

* * * * *

(g) Before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, if you operate a clay refractory products kiln or a chromium refractory products kiln that is subject to the work practice standard specified in item 3 or 4 of Table 3 to this subpart, and you

use a fuel other than natural gas or equivalent to fire the affected kiln, you must submit a report of alternative fuel use within 10 working days after terminating the use of the alternative fuel. The report must include the information in paragraphs (g)(1) through (6) of this section. On and after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you may not use a fuel other than natural gas or equivalent to fire the affected kiln.

* * * * *

(h) Beginning on **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, within 60 days after the date of completing each performance test required by this subpart, you must submit the results of the performance test following the procedures specified in paragraphs (h)(1) through (3) of this section.

(1) *Data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT website (https://www.epa.gov/electronic-reporting-air-emissions/electronic-reporting-tool-ert) at the time of the test*. Submit the results of the performance test to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI), which can be accessed through the EPA's CDX (*https://cdx.epa.gov/).* The data must be submitted in a file format generated using the EPA's ERT. Alternatively, you may submit an electronic file consistent with the extensible markup language (XML) schema listed on the EPA's ERT website.

(2) *Data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT website at the time of the test*. The results of the performance test must be included as an attachment in the ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT website. Submit the ERT generated package or alternative file to the EPA via CEDRI.

(3) *Confidential business information (CBI)*. Do not use CEDRI to submit information you claim as CBI. Anything submitted using CEDRI cannot later be claimed CBI. Although we do not expect persons to assert a claim of CBI, if you wish to assert a CBI claim for some of the information submitted under paragraph (h)(1) or (2) of this section, you must submit a complete file, including information claimed to be CBI, to the EPA. The file must be generated using the EPA's ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT website. Submit the file on a compact disc, flash drive, or other commonly used electronic storage medium and clearly mark the medium as CBI. Mail the electronic medium to U.S. EPA/OAPQS/CORE CBI Office, Attention: Group Leader, Measurement Policy Group, MD C404-02, 4930 Old Page Rd., Durham, NC 27703. The same file with the CBI omitted must be submitted to the EPA via the EPA's CDX as described in paragraphs (h)(1) and (2) of this section. All CBI claims must be asserted at the time of submission. Furthermore, under CAA section 114(c), emissions data is not entitled to confidential treatment, and the EPA is required to make emissions data available to the public. Thus, emissions data will not be protected as CBI and will be made publicly available.

(i) Beginning on **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, within 60 days after the date of completing each continuous emissions monitoring system (CEMS) performance evaluation (as defined in §63.2), you must submit the results of the performance evaluation following the procedures specified in paragraphs (i)(1) through (3) of this section.

(1) *Performance evaluations of CEMS measuring relative accuracy test audit (RATA) pollutants that are supported by the EPA's ERT as listed on the EPA's ERT website at the time of the evaluation*. Submit the results of the performance evaluation to the EPA via CEDRI, which

can be accessed through the EPA's CDX. The data must be submitted in a file format generated using the EPA's ERT. Alternatively, you may submit an electronic file consistent with the XML schema listed on the EPA's ERT website.

(2) *Performance evaluations of CEMS measuring RATA pollutants that are not supported by the EPA's ERT as listed on the EPA's ERT website at the time of the evaluation*. The results of the performance evaluation must be included as an attachment in the ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT website. Submit the ERT generated package or alternative file to the EPA via CEDRI.

(3) *CBI*. Do not use CEDRI to submit information you claim as CBI. Anything submitted using CEDRI cannot later be claimed CBI. Although we do not expect persons to assert a claim of CBI, if you wish to assert a CBI claim for some of the information submitted under paragraph (i)(1) or (2) of this section, you must submit a complete file, including information claimed to be CBI, to the EPA. The file must be generated using the EPA's ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT website. Submit the file on a compact disc, flash drive, or other commonly used electronic storage medium and clearly mark the medium as CBI. Mail the electronic medium to U.S. EPA/OAQPS/CORE CBI Office, Attention: Group Leader, Measurement Policy Group, MD C404-02, 4930 Old Page Rd., Durham, NC 27703. The same file with the CBI omitted must be submitted to the EPA via the EPA's CDX as described in paragraphs (h)(1) and (2) of this section. All CBI claims must be asserted at the time of submission. Furthermore, under CAA section 114(c), emissions data is not entitled to confidential treatment, and the EPA is required to make emissions data available to the public. Thus, emissions data will not be protected as CBI and will be made publicly available.

(j) Beginning **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you must submit all subsequent Notification of Compliance Status reports in PDF format to the EPA via CEDRI, which can be accessed through EPA's CDX (*https://cdx.epa.gov/*).The EPA will make all the information submitted through CEDRI available to the public without further notice to you. Do not use CEDRI to submit information you claim as CBI. Anything submitted using CEDRI cannot later be claimed CBI. Although we do not expect persons to assert a claim of CBI, if you wish to assert a CBI claim, submit a complete report, including information claimed to be CBI, to the EPA. Submit the file on a compact disc, flash drive, or other commonly used electronic storage medium and clearly mark the medium as CBI. Mail the electronic medium to U.S. EPA/OAQPS/CORE CBI Office, Attention: Refractory Lead MD C404-02, 4930 Old Page Rd., Durham, NC 27703. The same file with the CBI omitted must be submitted to the EPA via the EPA's CDX as described earlier in this paragraph (j). All CBI claims must be asserted at the time of submission. Furthermore, under CAA section 114(c), emissions data is not entitled to confidential treatment, and the EPA is required to make emissions data available to the public. Thus, emissions data will not be protected as CBI and will be made publicly available.

(k) If you are required to electronically submit a report through CEDRI in the EPA's CDX, you may assert a claim of EPA system outage for failure to timely comply with that reporting requirement. To assert a claim of EPA system outage, you must meet the requirements outlined in paragraphs (k)(1) through (7) of this section.

(1) You must have been or will be precluded from accessing CEDRI and submitting a required report within the time prescribed due to an outage of either the EPA's CEDRI or CDX systems.

(2) The outage must have occurred within the period of time beginning five business days prior to the date that the submission is due.

(3) The outage may be planned or unplanned.

(4) You must submit notification to the Administrator in writing as soon as possible following the date you first knew, or through due diligence should have known, that the event may cause or has caused a delay in reporting.

(5) You must provide to the Administrator a written description identifying:

(i) The date(s) and time(s) when CDX or CEDRI was accessed and the system was unavailable;

(ii) A rationale for attributing the delay in reporting beyond the regulatory deadline to EPA system outage;

(iii) A description of measures taken or to be taken to minimize the delay in reporting; and

(iv) The date by which you propose to report, or if you have already met the reporting requirement at the time of the notification, the date you reported.

(6) The decision to accept the claim of EPA system outage and allow an extension to the reporting deadline is solely within the discretion of the Administrator.

(7) In any circumstance, the report must be submitted electronically as soon as possible after the outage is resolved.

(l) If you are required to electronically submit a report through CEDRI in the EPA's CDX, you may assert a claim of *force majeure* for failure to timely comply with that reporting requirement. To assert a claim of *force majeure*, you must meet the requirements outlined in paragraphs (l)(1) through (5) of this section.

(1) You may submit a claim if a *force majeure* event is about to occur, occurs, or has occurred or there are lingering effects from such an event within the period of time beginning five business days prior to the date the submission is due. For the purposes of this section, a *force majeure* event is defined as 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 within the time period prescribed. Examples of such events are acts of nature (e.g., hurricanes, earthquakes, or floods), acts of war or terrorism, or equipment failure or safety hazard beyond the control of the affected facility (e.g., large scale power outage).

(2) You must submit notification to the Administrator in writing as soon as possible following the date you first knew, or through due diligence should have known, that the event may cause or has caused a delay in reporting.

(3) You must provide to the Administrator:

(i) A written description of the *force majeure* event;

(ii) A rationale for attributing the delay in reporting beyond the regulatory deadline to the *force majeure* event;

(iii) A description of measures taken or to be taken to minimize the delay in reporting; and

(iv) The date by which you propose to report, or if you have already met the reporting requirement at the time of the notification, the date you reported.

(4) The decision to accept the claim of *force majeure* and allow an extension to the reporting deadline is solely within the discretion of the Administrator.

(5) In any circumstance, the reporting must occur as soon as possible after the *force majeure* event occurs.

13. Section 63.9816 is amended by revising paragraph (a)(2) and paragraphs (c)(5), (8), and (10) to read as follows:

§63.9816 What records must I keep?

(a) * * *

(2) Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the records in §63.6(e)(3)(iii) through (v) related SSM.

* * * * *

(c) * * *

(5) For each deviation of an operating limit parameter value, record the information in paragraphs (c)(5)(i) through (iv) of this section.

(i) The date, time, and duration in hours of the deviation.

(ii) On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, a list of the affected sources or equipment.

(iii) On or after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, an estimate of the quantity in pounds of each regulated pollutant over any emission limit and a description of the method used to estimate emissions.

(iv) Actions taken to minimize emissions in accordance with §63.9792(b), a brief explanation of the cause of the deviation, and the corrective action taken to return the affected unit to its normal or usual manner of operation.

* * * * *

(8) Records of maintenance activities and inspections performed on control devices, including all records associated with the scheduled maintenance of the THC control devices on continuous kilns used to manufacture refractory products that use organic HAP, as specified in §63.9792(e).

* * * * *

(10) Current copies of the OM&M plan, including any revisions and records documenting conformance with those revisions.

14. Section 63.9820 is revised to read as follows:

§63.9820 What parts of the General Provisions apply to me?

Table 11 to this subpart shows which parts of the General Provisions specified in §§63.1 through 63.16 apply to you.

15. Section 63.9822 is amended by revising paragraph (c) introductory text and adding paragraph (c)(5) to read as follows:

§63.9822 Who implements and enforces this subpart?

* * * * *

(c) The authorities that cannot be delegated to state, local, or tribal agencies are as specified in paragraphs (c)(1) through (5) of this section.

* * * * *

(5) Approval of an alternative to any electronic reporting to the EPA required by this subpart.

16. Section 63.9824 is amended by revising the definition of "Particulate matter (PM)" to read as follows:

§63.9824 What definitions apply to this subpart?

* * * * *

Particulate matter (PM) means, for the purposes of this subpart, emissions of particulate matter that serve as a measure of total particulate emissions as measured by EPA Method 5 of 40 CFR part 60, appendix A-3.

* * * * *

17. Table 1 to Subpart SSSSS is revised to read as follows:

Table 1 to Subpart SSSSS of Part 63—Emission Limits

As stated in §63.9788, you must comply with the emission limits for affected sources in the following table:

For . . .	You must meet the following emission limits . . .
1. Each new or existing curing oven, shape dryer, and kiln that is used to process refractory products that use organic HAP; each new or existing coking oven and defumer that is used to produce pitch-impregnated refractory products; each new shape preheater that is used to produce pitch-impregnated refractory products; AND each new or existing process unit that is exhausted to a thermal or catalytic oxidizer that also controls emissions from an affected shape preheater or pitch working tank	As specified in items 2 through 9 of this table.
2. Continuous process units that are controlled with a thermal or catalytic oxidizer	a. The 3-hour block average THC concentration must not exceed 20 parts per million by volume, dry basis (ppmvd), corrected to 18 percent oxygen, at the outlet of the control device; or
	b. The 3-hour block average THC mass emissions rate must be reduced by at least 95 percent.
3. Continuous process units that are equipped with a control device other than a thermal or catalytic oxidizer	a. The 3-hour block average THC concentration must not exceed 20 ppmvd, corrected to 18 percent oxygen, at the outlet of the control device; or

For . . .	You must meet the following emission limits . . .
	b. The 3-hour block average THC mass emissions rate must be reduced by at least 95 percent.
4. Continuous process units that use process changes to reduce organic HAP emissions	The 3-hour block average THC concentration must not exceed 20 ppmvd, corrected to 18 percent oxygen, at the outlet of the process gas stream.
5. Continuous kilns that are not equipped with a control device	The 3-hour block average THC concentration must not exceed 20 ppmvd, corrected to 18 percent oxygen, at the outlet of the process gas stream.
6. Batch process units that are controlled with a thermal or catalytic oxidizer	a. The 2-run block average THC concentration for the 3-hour peak emissions period must not exceed 20 ppmvd, corrected to 18 percent oxygen, at the outlet of the control device; or
	b. The 2-run block average THC mass emissions rate for the 3-hour peak emissions period must be reduced by at least 95 percent.
7. Batch process units that are equipped with a control device other than a thermal or catalytic oxidizer	a. The 2-run block average THC concentration for the 3-hour peak emissions period must not exceed 20 ppmvd, corrected to 18 percent oxygen, at the outlet of the control device; or
	b. The 2-run block average THC mass emissions rate for the 3-hour peak emissions period must be reduced by at least 95 percent.
8. Batch process units that use process changes to reduce organic HAP emissions	The 2-run block average THC concentration for the 3-hour peak emissions period must not exceed 20 ppmvd, corrected to 18 percent oxygen, at the outlet of the process gas stream.
9. Batch process kilns that are not equipped with a control device	The 2-run block average THC concentration for the 3-hour peak emissions period must not exceed 20 ppmvd, corrected to 18 percent oxygen, at the outlet of the process gas stream.

For . . .	You must meet the following emission limits . . .
10. Each new continuous kiln that is used to produce clay refractory products	a. The 3-hour block average HF emissions must not exceed 0.019 kilograms per megagram (kg/Mg) (0.038 pounds per ton (lb/ton)) of uncalcined clay processed, OR the 3-hour block average HF mass emissions rate must be reduced by at least 90 percent; and
	b. The 3-hour block average HCl emissions must not exceed 0.091 kg/Mg (0.18 lb/ton) of uncalcined clay processed, OR the 3-hour block average HCl mass emissions rate must be reduced by at least 30 percent; and
	c. The 3-hour block average PM emissions must not exceed 1.4 kg/Mg (3.1 lb/hr); and
	d. The 3-hour block average Hg concentration must not exceed 6.1 micrograms per dry standard cubic meter (µg/dscm), corrected to 18 percent oxygen, at the outlet of the control device or the process gas stream.
11. Each new batch process kiln that is used to produce clay refractory products	a. The 2-run block average HF mass emissions rate for the 3-hour peak emissions period must be reduced by at least 90 percent; and
	b. The 2-run block average HCl mass emissions rate for the 3-hour peak emissions period must be reduced by at least 30 percent; and
	c. The 2-run block average PM emissions for the 3-hour peak emissions period must not exceed 1.4 kg/Mg (3.1 lb/hr); and
	d. The 2-run block average Hg concentration for the 3-hour peak emissions period must not exceed 6.1 µg/dscm, corrected to 18 percent oxygen, at the outlet of the control device or the process gas stream.

For . . .	You must meet the following emission limits . . .
12. Each existing continuous kiln that is used to produce clay refractory products on and after **[INSERT DATE 1 YEAR AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**	a. The 3-hour block average PM emissions must not exceed 4.3 kg/Mg (9.5 lb/hr); and
	b. The 3-hour block average Hg concentration must not exceed 18 µg/dscm, corrected to 18 percent oxygen, at the outlet of the control device or the process gas stream.
13. Each existing batch kiln that is used to produce clay refractory products on and after **[INSERT DATE 1 YEAR AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**	a. The 2-run block average PM emissions for the 3-hour peak emissions period must not exceed 4.3 kg/Mg (9.5 lb/hr); and
	b. The 2-run block average Hg concentration for the 3-hour peak emissions period must not exceed 18 µg/dscm, corrected to 18 percent oxygen, at the outlet of the control device or the process gas stream.

18. Table 2 to Subpart SSSSS is revised to read as follows:

Table 2 to Subpart SSSSS of Part 63—Operating Limits

As stated in §63.9788, you must comply with the operating limits for affected sources in the following table:

For . . .	You must . . .
1. Each affected source listed in Table 1 to this subpart	a. Operate all affected sources according to the requirements to this subpart on and after the date on which the initial performance test is conducted or required to be conducted, whichever date is earlier; and
	b. Capture emissions and vent them through a closed system; and

For . . .	You must . . .
	c. Operate each control device that is required to comply with this subpart on each affected source during all periods that the source is operating, except where specified in §63.9792(e), item 2 of this table, item 5 of Table 3 to this subpart, item 13 of Table 4 to this subpart, and item 6 of Table 9 to this subpart for THC control devices on continuous kilns used to manufacture refractory products that use organic HAP; and
	d. Record all operating parameters specified in Table 8 to this subpart for the affected source; and
	e. Prepare and implement a written OM&M plan as specified in §63.9792(d).
2. Each affected continuous kiln used to manufacture refractory products that use organic HAP that is equipped with an emission control device for THC	a. Receive approval from the Administrator before taking the control device on the affected kiln out of service for scheduled maintenance, as specified in §63.9792(e); and
	b. Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, minimize HAP emissions from the affected kiln during all periods of scheduled maintenance of the kiln control device when the kiln is operating and the control device is out of service; on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, you must minimize HAP emissions during the period when the kiln is operating and the control device is out of service by complying with the applicable standard in Table 3 to this subpart; and
	c. Minimize the duration of all periods of scheduled maintenance of the kiln control device when the kiln is operating and the control device is out of service. On and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the total time during which the kiln is operating and the control device is out of service for the each year on a 12-month rolling basis must not exceed 750 hours.

For . . .	You must . . .
3. Each new or existing curing oven, shape dryer, and kiln that is used to process refractory products that use organic HAP; each new or existing coking oven and defumer that is used to produce pitch-impregnated refractory products; each new shape preheater that is used to produce pitch-impregnated refractory products; AND each new or existing process unit that is exhausted to a thermal or catalytic oxidizer that also controls emissions from an affected shape preheater or pitch working tank	Satisfy the applicable operating limits specified in items 4 through 9 of this table.
4. Each affected continuous process unit	Maintain the 3-hour block average organic HAP processing rate (pounds per hour) at or below the maximum organic HAP processing rate established during the most recent performance test.
5. Continuous process units that are equipped with a thermal oxidizer	Maintain the 3-hour block average operating temperature in the thermal oxidizer combustion chamber at or above the minimum allowable operating temperature for the oxidizer established during the most recent performance test.
6. Continuous process units that are equipped with a catalytic oxidizer	a. Maintain the 3-hour block average operating temperature at the inlet of the catalyst bed of the oxidizer at or above the minimum allowable operating temperature for the oxidizer established during the most recent performance test; and
	b. Check the activity level of the catalyst at least every 12 months.
7. Each affected batch process unit	For each batch cycle, maintain the organic HAP processing rate (pounds per batch) at or below the maximum organic HAP processing rate established during the most recent performance test.

For . . .	You must . . .
8. Batch process units that are equipped with a thermal oxidizer	a. From the start of each batch cycle until 3 hours have passed since the process unit reached maximum temperature, maintain the hourly average operating temperature in the thermal oxidizer combustion chamber at or above the minimum allowable operating temperature established for the corresponding period during the most recent performance test, as determined according to item 11 of Table 4 to this subpart; and
	b. For each subsequent hour of the batch cycle, maintain the hourly average operating temperature in the thermal oxidizer combustion chamber at or above the minimum allowable operating temperature established for the corresponding hour during the most recent performance test, as specified in item 13 of Table 4 to this subpart.
9. Batch process units that are equipped with a catalytic oxidizer	a. From the start of each batch cycle until 3 hours have passed since the process unit reached maximum temperature, maintain the hourly average operating temperature at the inlet of the catalyst bed at or above the minimum allowable operating temperature established for the corresponding period during the most recent performance test, as determined according to item 12 of Table 4 to this subpart; and
	b. For each subsequent hour of the batch cycle, maintain the hourly average operating temperature at the inlet of the catalyst bed at or above the minimum allowable operating temperature established for the corresponding hour during the most recent performance test, as specified in item 13 of Table 4 to this subpart; and
	c. Check the activity level of the catalyst at least every 12 months.
10. Each new kiln that is used to process clay refractory products	Satisfy the applicable operating limits specified in items 11 through 13 of this table.
11. Each affected kiln that is equipped with a DLA	a. Maintain the 3-hour block average pressure drop across the DLA at or above the minimum levels established during the most recent performance test; and

For . . .	You must . . .
	b. Maintain free-flowing limestone in the feed hopper, silo, and DLA at all times; and
	c. Maintain the limestone feeder at or above the level established during the most recent performance test; and
	d. Use the same grade of limestone from the same source as was used during the most recent performance test and maintain records of the source and type of limestone used; and
	e. Maintain no VE from the stack.
12. Each affected kiln that is equipped with a DIFF or DLS/FF	a. Initiate corrective action within 1 hour of a bag leak detection system alarm and complete corrective actions in accordance with the OM&M plan; and
	b. Verify at least once each 8-hour shift that lime is free-flowing by means of a visual check, checking the output of a load cell, carrier gas/lime flow indicator, or carrier gas pressure drop measurement system; and
	c. Record the lime feeder setting daily to verify that the feeder setting is at or above the level established during the most recent performance test.
13. Each affected kiln that is equipped with a wet scrubber	a. Maintain the 3-hour block average pressure drop across the scrubber, liquid pH, and liquid flow rate at or above the minimum levels established during the most recent performance test; and
	b. If chemicals are added to the scrubber liquid, maintain the 3-hour block average chemical feed rate at or above the minimum chemical feed rate established during the most recent performance test.
14. Each new and existing kiln used to process clay refractory products that is equipped with an activated carbon injection system	Maintain the average carbon flow rate for each 3-hour block period at or above the average carbon flow rate established during the Hg performance test in which compliance was demonstrated.
15. Each new and existing kiln that is used to process clay refractory products with no add-on control and each existing kiln that is equipped with a DLA	Maintain no VE from the stack.

For . . .	You must . . .
16. Each existing kiln used to process clay refractory products that is equipped with a FF	Initiate corrective action within 1 hour of a bag leak detection system alarm and complete corrective actions in accordance with the OM&M plan OR maintain no VE from the stack.
17. Each existing kiln used to process clay refractory products that is equipped with a wet scrubber	Maintain the 3-hour block average pressure drop across the scrubber and liquid flow rate at or above the minimum levels established during the most recent performance test.

19. Table 3 to Subpart SSSSS is revised to read as follows:

Table 3 to Subpart SSSSS of Part 63—Work Practice Standards

As stated in §63.9788, you must comply with the work practice standards for affected sources in the following table:

For . . .	You must . . .	According to one of the following requirements . . .
1. Each basket or container that is used for holding fired refractory shapes in an existing shape preheater and autoclave during the pitch impregnation process	a. Control POM emissions from any affected shape preheater	i. At least every 10 preheating cycles, clean the residual pitch from the surfaces of the basket or container by abrasive blasting prior to placing the basket or container in the affected shape preheater; or
		ii. At least every 10 preheating cycles, subject the basket or container to a thermal process cycle that meets or exceeds the operating temperature and cycle time of the affected preheater, AND is conducted in a process unit that is exhausted to a thermal or catalytic oxidizer that is comparable to the control device used on an affected defumer or coking oven; or
		iii. Capture emissions from the affected shape preheater and vent them to the control device that is used to control emissions from an affected defumer or coking oven, or to a comparable thermal or catalytic oxidizer.

For . . .	You must . . .	According to one of the following requirements . . .
2. Each new or existing pitch working tank	Control POM emissions	Capture emissions from the affected pitch working tank and vent them to the control device that is used to control emissions from an affected defumer or coking oven, OR to a comparable thermal or catalytic oxidizer.
3. Each new or existing chromium refractory products kiln	Minimize fuel-based HAP emissions	Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, use natural gas, or equivalent, as the kiln fuel, except during periods of natural gas curtailment or supply interruption, as defined in §63.9824. On and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, use natural gas, or equivalent, as the kiln fuel at all times.
4. Each existing clay refractory products kiln	Minimize fuel-based HAP emissions	Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, use natural gas, or equivalent, as the kiln fuel, except during periods of natural gas curtailment or supply interruption, as defined in §63.9824. On and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, use natural gas, or equivalent, as the kiln fuel at all times.
5. Each affected continuous kiln used to manufacture refractory products that use organic HAP that is equipped with an emission control device for THC with Administrator approval to take the control device out of service for scheduled maintenance, as specified in §63.9792(e)	Minimize HAP emissions	i. Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, minimize HAP emissions from the affected kiln during all periods of scheduled maintenance of the kiln control device when the kiln is operating and the control device is out of service consistent with your OM&M plan and minimize the time period during which the kiln is operating and the control device is out of service; or

For . . .	You must . . .	According to one of the following requirements . . .
		ii. On and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, minimize HAP emissions during the period when the kiln is operating and the control device is out of service by maintaining the organic HAP processing rate (lb/hr) below the average organic HAP processing rate based on actual production on a 6-month rolling basis (not to include periods of kiln shut down) or below the organic HAP processing rate (lb/hr) that coincides with the lowest hour of the most recent 3-hour performance test, whichever is lower); and minimize the time period during which the kiln is operating and the control device is out of service, not to exceed 750 hours for the year (on a 12-month rolling basis).
6. Each new or existing curing oven, shape dryer, and kiln that is used to process refractory products that use organic HAP, on and after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**	Minimize fuel-based HAP emissions	Use natural gas, or equivalent, as the kiln fuel, at all times.

20. Table 4 to Subpart SSSSS is revised to read as follows:

Table 4 to Subpart SSSSS to Part 63—Requirements for Performance Tests

As stated in §63.9800, you must comply with the requirements for performance tests for affected sources in the following table:

For . . .	You must . . .	Using . . .	According to the following requirements . . .
1. Each affected source listed in Table 1 to this subpart	a. Conduct performance tests	i. The requirements of the general provisions in subpart A of this part and the requirements to this subpart	(1) Record the date of the test; and
			(2) Identify the emission source that is tested; and
			(3) Collect and record the corresponding operating parameter and emission test data listed in this table for each run of the performance test; and
			(4) Repeat the performance test at least every 5 years; and
			(5) Repeat the performance test before changing the parameter value for any operating limit specified in your OM&M plan; and
			(6) If complying with the THC concentration or THC percentage reduction limits specified in items 2 through 9 of Table 1 to this subpart, repeat the performance test under the conditions specified in items 2.a.2. and 2.a.3. of this table; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(7) If complying with the emission limits for new clay refractory products kilns specified in items 10 and 11 of Table 1 to this subpart, repeat the performance test under the conditions specified in items 14.a.i.4. and 17.a.i.4. of this table.
	b. Select the locations of sampling ports and the number of traverse points	i. Method 1 or 1A of 40 CFR part 60, appendix A-1	(1) To demonstrate compliance with the percentage reduction limits specified in items 2.b., 3.b., 6.b., 7.b., 10, and 11 of Table 1 to this subpart, locate sampling sites at the inlet of the control device and at either the outlet of the control device or at the stack prior to any releases to the atmosphere; and
			(2) To demonstrate compliance with any other emission limit specified in Table 1 to this subpart, locate all sampling sites at the outlet of the control device or at the stack prior to any releases to the atmosphere.
	c. Determine gas velocity and volumetric flow rate	Method 2, 2A, 2C, 2D, 2F, or 2G of 40 CFR part 60, appendix A-1 and A-2	Measure gas velocities and volumetric flow rates at 1-hour intervals throughout each test run.
	d. Conduct gas molecular weight analysis	i. Method 3, 3A, or 3B of 40 CFR part 60, appendix A-2; or	As specified in the applicable test method.

For . . .	You must . . .	Using . . .	According to the following requirements . . .
		ii. ASME PTC 19.10-1981-Part 10[a]	You may use the manual procedures (but not instrumental procedures) of ASME PTC 19.10-1981-Part 10[a] as an alternative to EPA Method 3B.
	e. Measure gas moisture content	Method 4 of 40 CFR part 60, appendix A-3	As specified in the applicable test method.
2. Each new or existing curing oven, shape dryer, and kiln that is used to process refractory products that use organic HAP; each new or existing coking oven and defumer that is used to produce pitch-impregnated refractory products; each new shape preheater that is used to produce pitch-impregnated refractory products; AND each new or existing process unit that is exhausted to a thermal or catalytic oxidizer that also controls emissions from an affected shape preheater or pitch working tank	a. Conduct performance tests		(1) Conduct the performance test while the source is operating at the maximum organic HAP processing rate, as defined in §63.9824, reasonably expected to occur; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(2) Repeat the performance test before starting production of any product for which the organic HAP processing rate is likely to exceed the maximum organic HAP processing rate established during the most recent performance test by more than 10 percent, as specified in §63.9798(c); and
			(3) Repeat the performance test on any affected uncontrolled kiln following process changes (e.g., shorter curing oven cycle time) that could increase organic HAP emissions from the affected kiln, as specified in §63.9798(d).
	b. Satisfy the applicable requirements listed in items 3 through 13 of this table		
3. Each affected continuous process unit	a. Perform a minimum of 3 test runs	The appropriate test methods specified in items 1, 4, and 5 of this table	Each test run must be at least 1 hour in duration.

For . . .	You must . . .	Using . . .	According to the following requirements . . .
	b. Establish the operating limit for the maximum organic HAP processing rate	i. Method 311 of 40 CFR part 63, appendix A, OR material safety data sheets (MSDS), OR product labels to determine the mass fraction of organic HAP in each resin, binder, or additive; and	(1) Calculate and record the organic HAP content of all refractory shapes that are processed during the performance test, based on the mass fraction of organic HAP in the resins, binders, or additives; the mass fraction of each resin, binder, or additive, in the product; and the process feed rate; and
		ii. Product formulation data that specify the mass fraction of each resin, binder, and additive in the products that are processed during the performance test; and	(2) Calculate and record the organic HAP processing rate (pounds per hour) for each test run; and
		iii. Process feed rate data (tons per hour)	(3) Calculate and record the maximum organic HAP processing rate as the average of the organic HAP processing rates for the three test runs.
	c. Record the operating temperature of the affected source	Process data	During each test run and at least once per hour, record the operating temperature in the highest temperature zone of the affected source.
4. Each continuous process unit that is subject to the THC emission limit listed in item 2.a., 3.a., 4, or 5 of Table 1 to this subpart	a. Measure THC concentrations at the outlet of the control device or in the stack	i. Method 25A of 40 CFR part 60, appendix A-7	(1) Each minute, measure and record the concentrations of THC in the exhaust stream; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(2) Provide at least 50 1-minute measurements for each valid hourly average THC concentration.
	b. Measure oxygen concentrations at the outlet of the control device or in the stack	i. Method 3A of 40 CFR part 60, appendix A-2	(1) Each minute, measure and record the concentrations of oxygen in the exhaust stream; and
			(2) Provide at least 50 1-minute measurements for each valid hourly average THC concentration.
	c. Determine the hourly average THC concentration, corrected to 18 percent oxygen	i. Equation 1 of §63.9800(g)(1); and ii. The 1-minute THC and oxygen concentration data	(1) Calculate the hourly average THC concentration for each hour of the performance test as the average of the 1-minute THC measurements; and
			(2) Calculate the hourly average oxygen concentration for each hour of the performance test as the average of the 1-minute oxygen measurements; and
			(3) Correct the hourly average THC concentrations to 18 percent oxygen using Equation 1 of §63.9800(g)(1).
	d. Determine the 3-hour block average THC emission concentration, corrected to 18 percent oxygen	The hourly average concentration of THC, corrected to 18 percent oxygen, for each test run	Calculate the 3-hour block average THC emission concentration, corrected to 18 percent oxygen, as the average of the hourly average THC emission concentrations, corrected to 18 percent oxygen.

For . . .	You must . . .	Using . . .	According to the following requirements . . .
5. Each continuous process unit that is subject to the THC percentage reduction limit listed in item 2.b. or 3.b. of Table 1 to this subpart	a. Measure THC concentrations at the inlet and outlet of the control device	i. Method 25A of 40 CFR part 60, appendix A-7	(1) Each minute, measure and record the concentrations of THC at the inlet and outlet of the control device; and
			(2) Provide at least 50 1-minute measurements for each valid hourly average THC concentration at the control device inlet and outlet.
	b. Determine the hourly THC mass emissions rates at the inlet and outlet of the control device	i. The 1-minute THC concentration data at the control device inlet and outlet; and ii. The volumetric flow rates at the control device inlet and outlet	Calculate the hourly THC mass emissions rates at the control device inlet and outlet for each hour of the performance test.
	c. Determine the 3-hour block average THC percentage reduction	i. The hourly THC mass emissions rates at the inlet and outlet of the control device	(1) Calculate the hourly THC percentage reduction for each hour of the performance test using Equation 2 of §63.9800(g)(1); and
			(2) Calculate the 3-hour block average THC percentage reduction.
6. Each continuous process unit that is equipped with a thermal oxidizer	a. Establish the operating limit for the minimum allowable thermal oxidizer combustion chamber temperature	i. Continuous recording of the output of the combustion chamber temperature measurement device	(1) At least every 15 minutes, measure and record the thermal oxidizer combustion chamber temperature; and
			(2) Provide at least one measurement during at least three 15-minute periods per hour of testing; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(3) Calculate the hourly average thermal oxidizer combustion chamber temperature for each hour of the performance test; and
			(4) Calculate the minimum allowable combustion chamber temperature as the average of the combustion chamber temperatures for the three test runs, minus 14 °C (25 °F).
7. Each continuous process unit that is equipped with a catalytic oxidizer	a. Establish the operating limit for the minimum allowable temperature at the inlet of the catalyst bed	i. Continuous recording of the output of the temperature measurement device	(1) At least every 15 minutes, measure and record the temperature at the inlet of the catalyst bed; and
			(2) Provide at least one catalyst bed inlet temperature measurement during at least three 15-minute periods per hour of testing; and
			(3) Calculate the hourly average catalyst bed inlet temperature for each hour of the performance test; and
			(4) Calculate the minimum allowable catalyst bed inlet temperature as the average of the catalyst bed inlet temperatures for the three test runs, minus 14 °C (25 °F).

For . . .	You must . . .	Using . . .	According to the following requirements . . .
8. Each affected batch process unit	a. Perform a minimum of two test runs	i. The appropriate test methods specified in items 1, 9, and 10 of this table	(1) Each test run must be conducted over a separate batch cycle unless you satisfy the requirements of §63.9800(f)(3) and (4); and
			(2) Each test run must begin with the start of a batch cycle, except as specified in item 8.a.i.4. of this table; and
			(3) Each test run must continue until the end of the batch cycle, except as specified in items 8.a.i.4. and 8.a.i.5. of this table; and
			(4) If you develop an emissions profile, as described in §63.9802(a), AND for sources equipped with a thermal or catalytic oxidizer, you do not reduce the oxidizer operating temperature, as specified in item 13 of this table, you can limit each test run to the 3-hour peak THC emissions period; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(5) If you do not develop an emissions profile, a test run can be stopped, and the results of that run considered complete, if you measure emissions continuously until at least 3 hours after the affected process unit has reached maximum temperature, AND the hourly average THC mass emissions rate has not increased during the 3-hour period since maximum process temperature was reached, and the hourly average concentrations of THC at the inlet of the control device have not exceeded 20 ppmvd, corrected to 18 percent oxygen, during the 3-hour period since maximum process temperature was reached or the hourly average THC percentage reduction has been at least 95 percent during the 3-hour period since maximum process temperature was reached, AND, for sources equipped with a thermal or catalytic oxidizer, at least 1 hour has passed since any reduction in the operating temperature of the oxidizer, as specified in item 13 of this table.

For . . .	You must . . .	Using . . .	According to the following requirements . . .
	b. Establish the operating limit for the maximum organic HAP processing rate	i. Method 311 of 40 CFR part 63, appendix A, OR MSDS, OR product labels to determine the mass fraction of organic HAP in each resin, binder, or additive; and	(1) Calculate and record the organic HAP content of all refractory shapes that are processed during the performance test, based on the mass fraction of HAP in the resins, binders, or additives; the mass fraction of each resin, binder, or additive, in the product, and the batch weight prior to processing; and
		ii. Product formulation data that specify the mass fraction of each resin, binder, and additive in the products that are processed during the performance test; and iii. Batch weight (tons)	(2) Calculate and record the organic HAP processing rate (pounds per batch) for each test run; and (3) Calculate and record the maximum organic HAP processing rate as the average of the organic HAP processing rates for the two test runs.
	c. Record the batch cycle time	Process data	Record the total elapsed time from the start to the completion of the batch cycle.
	d. Record the operating temperature of the affected source	Process data	Record the operating temperature of the affected source at least once every hour from the start to the completion of the batch cycle.
9. Each batch process unit that is subject to the THC emission limit listed in item 6.a., 7.a., 8, or 9 of Table 1 to this subpart	a. Measure THC concentrations at the outlet of the control device or in the stack	i. Method 25A of 40 CFR part 60, appendix A-7	(1) Each minute, measure and record the concentrations of THC in the exhaust stream; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(2) Provide at least 50 1-minute measurements for each valid hourly average THC concentration.
	b. Measure oxygen concentrations at the outlet of the control device or in the stack	i. Method 3A of 40 CFR part 60, appendix A-2	(1) Each minute, measure and record the concentrations of oxygen in the exhaust stream; and
			(2) Provide at least 50 1-minute measurements for each valid hourly average oxygen concentration.
	c. Determine the hourly average THC concentration, corrected to 18 percent oxygen	i. Equation 1 of §63.9800(g)(1); and ii. The 1-minute THC and oxygen concentration data	(1) Calculate the hourly average THC concentration for each hour of the performance test as the average of the 1-minute THC measurements; and
			(2) Calculate the hourly average oxygen concentration for each hour of the performance test as the average of the 1-minute oxygen measurements; and
			(3) Correct the hourly average THC concentrations to 18 percent oxygen using Equation 1 of §63.9800(g)(1).

For . . .	You must . . .	Using . . .	According to the following requirements . . .
	d. Determine the 3-hour peak THC emissions period for each test run	The hourly average THC concentrations, corrected to 18 percent oxygen	Select the period of 3 consecutive hours over which the sum of the hourly average THC concentrations, corrected to 18 percent oxygen, is greater than the sum of the hourly average THC emission concentrations, corrected to 18 percent oxygen, for any other period of 3 consecutive hours during the test run.
	e. Determine the average THC concentration, corrected to 18 percent oxygen, for each test run	The hourly average THC emission concentrations, corrected to 18 percent oxygen, for the 3-hour peak THC emissions period	Calculate the average of the hourly average THC concentrations, corrected to 18 percent oxygen, for the 3 hours of the peak emissions period for each test run.
	f. Determine the 2-run block average THC concentration, corrected to 18 percent oxygen, for the emission test	The average THC concentration, corrected to 18 percent oxygen, for each test run	Calculate the average of the average THC concentrations, corrected to 18 percent oxygen, for each run.
10. Each batch process unit that is subject to the THC percentage reduction limit listed in item 6.b. or 7.b. of Table 1 to this subpart	a. Measure THC concentrations at the inlet and outlet of the control device	i. Method 25A of 40 CFR part 60, appendix A-7	(1) Each minute, measure and record the concentrations of THC at the control device inlet and outlet; and
			(2) Provide at least 50 1-minute measurements for each valid hourly average THC concentration at the control device inlet and outlet.

For . . .	You must . . .	Using . . .	According to the following requirements . . .
	b. Determine the hourly THC mass emissions rates at the control device inlet and outlet	i. The 1-minute THC concentration data at the control device inlet and outlet; and ii. The volumetric flow rates at the control device inlet and outlet	(1) Calculate the hourly mass emissions rates at the control device inlet and outlet for each hour of the performance test.
	c. Determine the 3-hour peak THC emissions period for each test run	The hourly THC mass emissions rates at the control device inlet	Select the period of 3 consecutive hours over which the sum of the hourly THC mass emissions rates at the control device inlet is greater than the sum of the hourly THC mass emissions rates at the control device inlet for any other period of 3 consecutive hours during the test run.
	d. Determine the average THC percentage reduction for each test run	i. Equation 2 of §63.9800(g)(2); and ii. The hourly THC mass emissions rates at the control device inlet and outlet for the 3-hour peak THC emissions period	Calculate the average THC percentage reduction for each test run using Equation 2 of §63.9800(g)(2).
	e. Determine the 2-run block average THC percentage reduction for the emission test	The average THC percentage reduction for each test run	Calculate the average of the average THC percentage reductions for each test run.
11. Each batch process unit that is equipped with a thermal oxidizer	a. Establish the operating limit for the minimum thermal oxidizer combustion chamber temperature	i. Continuous recording of the output of the combustion chamber temperature measurement device	(1) At least every 15 minutes, measure and record the thermal oxidizer combustion chamber temperature; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(2) Provide at least one temperature measurement during at least three 15-minute periods per hour of testing; and
			(3) Calculate the hourly average combustion chamber temperature for each hour of the 3-hour peak emissions period, as defined in item 9.d. or 10.c. of this table, whichever applies; and
			(4) Calculate the minimum allowable thermal oxidizer combustion chamber operating temperature as the average of the hourly combustion chamber temperatures for the 3-hour peak emissions period, minus 14 °C (25 °F).
12. Each batch process unit that is equipped with a catalytic oxidizer	a. Establish the operating limit for the minimum temperature at the inlet of the catalyst bed	i. Continuous recording of the output of the temperature measurement device	(1) At least every 15 minutes, measure and record the temperature at the inlet of the catalyst bed; and
			(2) Provide at least one catalyst bed inlet temperature measurement during at least three 15-minute periods per hour of testing; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(3) Calculate the hourly average catalyst bed inlet temperature for each hour of the 3-hour peak emissions period, as defined in item 9.d. or 10.c. of this table, whichever applies; and
			(4) Calculate the minimum allowable catalytic oxidizer catalyst bed inlet temperature as the average of the hourly catalyst bed inlet temperatures for the 3-hour peak emissions period, minus 14 °C (25 °F).
13. Each batch process unit that is equipped with a thermal or catalytic oxidizer	a. During each test run, maintain the applicable operating temperature of the oxidizer until emission levels allow the oxidizer to be shut off or the operating temperature of the oxidizer to be reduced		(1) The oxidizer can be shut off or the oxidizer operating temperature can be reduced if you do not use an emission profile to limit testing to the 3-hour peak emissions period, as specified in item 8.a.i.4. of this table; and
			(2) At least 3 hours have passed since the affected process unit reached maximum temperature; and
			(3) The applicable emission limit specified in item 6.a. or 6.b. of Table 1 to this subpart was met during each of the previous three 1-hour periods; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(4) The hourly average THC mass emissions rate did not increase during the 3-hour period since maximum process temperature was reached; and
			(5) The applicable emission limit specified in item 6.a. and 6.b. of Table 1 to this subpart was met during each of the four 15-minute periods immediately following the oxidizer temperature reduction; and
			(6) If the applicable emission limit specified in item 6.a. or 6.b. of Table 1 to this subpart was not met during any of the four 15-minute periods immediately following the oxidizer temperature reduction, you must return the oxidizer to its normal operating temperature as soon as possible and maintain that temperature for at least 1 hour; and
			(7) Continue the test run until the applicable emission limit specified in items 6.a. and 6.b. of Table 1 to this subpart is met for at least four consecutive 15-minute periods that immediately follow the temperature reduction; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(8) Calculate the hourly average oxidizer operating temperature for each hour of the performance test since the affected process unit reached maximum temperature.
14. Each new continuous kiln that is used to process clay refractory products	a. Measure emissions of HF and HCl	i. Method 26A of 40 CFR part 60, appendix A-8; or ii. Method 26 of 40 CFR part 60, appendix A-8; or iii. Method 320 of 40 CFR part 63, appendix A	(1) Conduct the test while the kiln is operating at the maximum production level; and (2) You may use EPA Method 26 of 40 CFR part 60, appendix A-8, only if no acid PM (e.g., HF or HCl dissolved in water droplets emitted by sources controlled by a wet scrubber) is present; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(3) If you use EPA Method 320 of 40 CFR part 63, appendix A, you must follow the analyte spiking procedures of Section 13 of EPA Method 320 unless you can demonstrate that the complete spiking procedure has been conducted at a similar source. ASTM D6348-12e1[a] may be used as an alternative to EPA Method 320 if the test plan preparation and implementation in Annexes A1-A8 are mandatory and the %R in Annex A5 is determined for each target analyte and is equal or greater than 70 percent and less than or equal to 130 percent; and
			(4) Repeat the performance test if the affected source is controlled with a DLA and you change the source of the limestone used in the DLA.
	b. Perform a minimum of 3 test runs	The appropriate test methods specified in items 1 and 14.a. of this table	Each test run must be at least 1 hour in duration.

For . . .	You must . . .	Using . . .	According to the following requirements . . .
15. Each new continuous kiln that is subject to the production-based HF and HCl emission limits specified in items 10.a. and 10.b. of Table 1 to this subpart	a. Record the uncalcined clay processing rate	i. Production data; and ii. Product formulation data that specify the mass fraction of uncalcined clay in the products that are processed during the performance test	(1) Record the production rate (tons per hour of fired product); and (2) Calculate and record the average rate at which uncalcined clay is processed (tons per hour) for each test run; and (3) Calculate and record the 3-run average uncalcined clay processing rate as the average of the average uncalcined clay processing rates for each test run.
	b. Determine the HF mass emissions rate at the outlet of the control device or in the stack	i. Method 26A of 40 CFR part 60, appendix A-8; or ii. Method 26 of 40 CFR part 60, appendix A-8; or iii. Method 320 of 40 CFR part 63, appendix A	Calculate the HF mass emissions rate for each test. ASTM D6348-12e1[a] may be used as an alternative to EPA Method 320 if the test plan preparation and implementation in Annexes A1-A8 are mandatory and the %R in Annex A5 is determined for each target analyte and is equal or greater than 70 percent and less than or equal to 130 percent.
	c. Determine the 3-hour block average production-based HF emissions rate	i. The HF mass emissions rate for each test run; and ii. The average uncalcined clay processing rate	(1) Calculate the hourly production-based HF emissions rate for each test run using Equation 3 of §63.9800(g)(3); and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(2) Calculate the 3-hour block average production-based HF emissions rate as the average of the hourly production-based HF emissions rates for each test run.
	d. Determine the HCl mass emissions rate at the outlet of the control device or in the stack	i. Method 26A of 40 CFR part 60, appendix A-8; or ii. Method 26 of 40 CFR part 60, appendix A-8; or iii. Method 320 of 40 CFR part 63, appendix A	Calculate the HCl mass emissions rate for each test run. ASTM D6348-12e1[a] may be used as an alternative to EPA Method 320 if the test plan preparation and implementation in Annexes A1-A8 are mandatory and the %R in Annex A5 is determined for each target analyte and is equal or greater than 70 percent and less than or equal to 130 percent.
	e. Determine the 3-hour block average production-based HCl emissions rate	i. The HCl mass emissions rate for each test run; and ii. The average uncalcined clay processing rate	(1) Calculate the hourly production-based HCl emissions rate for each test run using Equation 3 of §63.9800(g)(3); and
			(2) Calculate the 3-hour block average production-based HCl emissions rate as the average of the production-based HCl emissions rates for each test run.

For . . .	You must . . .	Using . . .	According to the following requirements . . .
16. Each new continuous kiln that is subject to the HF and HCl percentage reduction limits specified in items 10.a. and 10.b. of Table 1 to this subpart	a. Measure the HF mass emissions rates at the inlet and outlet of the control device	i. Method 26A of 40 CFR part 60, appendix A-8; or ii. Method 26 of 40 CFR part 60, appendix A-8; or iii. Method 320 of 40 CFR part 63, appendix A	Calculate the HF mass emissions rates at the control device inlet and outlet for each test run. ASTM D6348-12e1[a] may be used as an alternative to EPA Method 320 if the test plan preparation and implementation in Annexes A1-A8 are mandatory and the %R in Annex A5 is determined for each target analyte and is equal or greater than 70 percent and less than or equal to 130 percent.
	b. Determine the 3-hour block average HF percentage reduction	i. The HF mass emissions rates at the inlet and outlet of the control device for each test run	(1) Calculate the hourly HF percentage reduction using Equation 2 of §63.9800(g)(2); and
			(2) Calculate the 3-hour block average HF percentage reduction as the average of the HF percentage reductions for each test run.

For . . .	You must . . .	Using . . .	According to the following requirements . . .
	c. Measure the HCl mass emissions rates at the inlet and outlet of the control device	i. Method 26A of 40 CFR part 60, appendix A-8; or ii. Method 26 of 40 CFR part 60, appendix A-8; or iii. Method 320 of 40 CFR part 63, appendix A	Calculate the HCl mass emissions rates at the control device inlet and outlet for each test run. ASTM D6348-12e1[a] may be used as an alternative to EPA Method 320 if the test plan preparation and implementation in Annexes A1-A8 are mandatory and the %R in Annex A5 is determined for each target analyte and is equal or greater than 70 percent and less than or equal to 130 percent.
	d. Determine the 3-hour block average HCl percentage reduction.	i. The HCl mass emissions rates at the inlet and outlet of the control device for each test run	(1) Calculate the hourly HCl percentage reduction using Equation 2 of §63.9800(g)(2); and
			(2) Calculate the 3-hour block average HCl percentage reduction as the average of HCl percentage reductions for each test run.

For . . .	You must . . .	Using . . .	According to the following requirements . . .
17. Each new batch process kiln that is used to process clay refractory products	a. Measure emissions of HF and HCl at the inlet and outlet of the control device	i. Method 26A of 40 CFR part 60, appendix A-8; or ii. Method 26 of 40 CFR part 60, appendix A-8; or iii. Method 320 of 40 CFR part 63, appendix A	(1) Conduct the test while the kiln is operating at the maximum production level; and (2) You may use EPA Method 26 of 40 CFR part 60, appendix A, only if no acid PM (e.g., HF or HCl dissolved in water droplets emitted by sources controlled by a wet scrubber) is present; and (3) If you use EPA Method 320 of 40 CFR part 63, you must follow the analyte spiking procedures of Section 13 of EPA Method 320 unless you can demonstrate that the complete spiking procedure has been conducted at a similar source ASTM D6348-12e1[a] may be used as an alternative to EPA Method 320 if the test plan preparation and implementation in Annexes A1-A8 are mandatory and the %R in Annex A5 is determined for each target analyte and is equal or greater than 70 percent and less than or equal to 130 percent.; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(4) Repeat the performance test if the affected source is controlled with a DLA and you change the source of the limestone used in the DLA.
	b. Perform a minimum of 2 test runs	i. The appropriate test methods specified in items 1 and 17.a. of this table	(1) Each test run must be conducted over a separate batch cycle unless you satisfy the requirements of §63.9800(f)(3) and (4); and
			(2) Each test run must consist of a series of 1-hour runs at the inlet and outlet of the control device, beginning with the start of a batch cycle, except as specified in item 17.b.i.4. of this table; and
			(3) Each test run must continue until the end of the batch cycle, except as specified in item 17.b.i.4. of this table; and
			(4) If you develop an emissions profile, as described in §63.9802(b), you can limit each test run to the 3-hour peak HF emissions period.
	c. Determine the hourly HF and HCl mass emissions rates at the inlet and outlet of the control device	i. The appropriate test methods specified in items 1 and 17.a. of this table	Determine the hourly mass HF and HCl emissions rates at the inlet and outlet of the control device for each hour of each test run.

For . . .	You must . . .	Using . . .	According to the following requirements . . .
	d. Determine the 3-hour peak HF emissions period	The hourly HF mass emissions rates at the inlet of the control device	Select the period of 3 consecutive hours over which the sum of the hourly HF mass emissions rates at the control device inlet is greater than the sum of the hourly HF mass emissions rates at the control device inlet for any other period of 3 consecutive hours during the test run.
	e. Determine the 2-run block average HF percentage reduction for the emissions test	i. The hourly average HF emissions rates at the inlet and outlet of the control device	(1) Calculate the HF percentage reduction for each hour of the 3-hour peak HF emissions period using Equation 2 of §63.9800(g)(2); and
			(2) Calculate the average HF percentage reduction for each test run as the average of the hourly HF percentage reductions for the 3-hour peak HF emissions period for that run; and
			(3) Calculate the 2-run block average HF percentage reduction for the emission test as the average of the average HF percentage reductions for the two test runs.
	f. Determine the 2-run block average HCl percentage reduction for the emission test	i. The hourly average HCl emissions rates at the inlet and outlet of the control device	(1) Calculate the HCl percentage reduction for each hour of the 3-hour peak HF emissions period using Equation 2 §63.9800(g)(2); and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(2) Calculate the average HCl percentage reduction for each test run as the average of the hourly HCl percentage reductions for the 3-hour peak HF emissions period for that run; and
			(3) Calculate the 2-run block average HCl percentage reduction for the emission test as the average of the average HCl percentage reductions for the two test runs.
18. Each new kiln that is used to process clay refractory products and is equipped with a DLA	a. Establish the operating limit for the minimum pressure drop across the DLA	Data from the pressure drop measurement device during the performance test	(1) At least every 15 minutes, measure the pressure drop across the DLA; and
			(2) Provide at least one pressure drop measurement during at least three 15-minute periods per hour of testing; and
			(3) Calculate the hourly average pressure drop across the DLA for each hour of the performance test; and
			(4) Calculate and record the minimum pressure drop as the average of the hourly average pressure drops across the DLA for the two or three test runs, whichever applies.

For . . .	You must . . .	Using . . .	According to the following requirements . . .
	b. Establish the operating limit for the limestone feeder setting	Data from the limestone feeder during the performance test	(1) Ensure that limestone in the feed hopper, silo, and DLA is free-flowing at all times during the performance test; and
			(2) Establish the limestone feeder setting 1 week prior to the performance test; and
			(3) Record and maintain the feeder setting for the 1-week period that precedes the performance test and during the performance test.
19. Each new kiln that is used to process clay refractory products and is equipped with a DIFF or DLS/FF	a. Document conformance with specifications and requirements of the bag leak detection system	Data from the installation and calibration of the bag leak detection system	Submit analyses and supporting documentation demonstrating conformance with EPA guidance and specifications for bag leak detection systems as part of the Notification of Compliance Status.
	b. Establish the operating limit for the lime feeder setting	i. Data from the lime feeder during the performance test	(1) For continuous lime injection systems, ensure that lime in the feed hopper or silo is free-flowing at all times during the performance test; and
			(2) Record the feeder setting for the three test runs; and
			(3) If the feed rate setting varies during the three test runs, calculate and record the average feed rate for the two or three test runs, whichever applies.

For . . .	You must . . .	Using . . .	According to the following requirements . . .
20. Each new kiln that is used to process clay refractory products and is equipped with a wet scrubber	a. Establish the operating limit for the minimum scrubber pressure drop	i. Data from the pressure drop measurement device during the performance test	(1) At least every 15 minutes, measure the pressure drop across the scrubber; and
			(2) Provide at least one pressure drop measurement during at least three 15-minute periods per hour of testing; and
			(3) Calculate the hourly average pressure drop across the scrubber for each hour of the performance test; and
			(4) Calculate and record the minimum pressure drop as the average of the hourly average pressure drops across the scrubber for the two or three test runs, whichever applies.
	b. Establish the operating limit for the minimum scrubber liquid pH	i. Data from the pH measurement device during the performance test	(1) At least every 15 minutes, measure scrubber liquid pH; and
			(2) Provide at least one pH measurement during at least three 15-minute periods per hour of testing; and
			(3) Calculate the hourly average pH values for each hour of the performance test; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(4) Calculate and record the minimum liquid pH as the average of the hourly average pH measurements for the two or three test runs, whichever applies.
	c. Establish the operating limit for the minimum scrubber liquid flow rate	i. Data from the flow rate measurement device during the performance test	(1) At least every 15 minutes, measure the scrubber liquid flow rate; and
			(2) Provide at least one flow rate measurement during at least three 15-minute periods per hour of testing; and
			(3) Calculate the hourly average liquid flow rate for each hour of the performance test; and
			(4) Calculate and record the minimum liquid flow rate as the average of the hourly average liquid flow rates for the two or three test runs, whichever applies.
	d. If chemicals are added to the scrubber liquid, establish the operating limit for the minimum scrubber chemical feed rate	i. Data from the chemical feed rate measurement device during the performance test	(1) At least every 15 minutes, measure the scrubber chemical feed rate; and
			(2) Provide at least one chemical feed rate measurement during at least three 15-minute periods per hour of testing; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(3) Calculate the hourly average chemical feed rate for each hour of the performance test; and
			(4) Calculate and record the minimum chemical feed rate as the average of the hourly average chemical feed rates for the two or three test runs, whichever applies.
21. Each new and existing kiln that is used to process clay refractory products that is subject to the PM limits specified in items 10.c. 11.c, 12.a, and 13.a of Table 1 to this subpart	Measure PM emissions	Method 5 of 40 CFR part 60, appendix A-3	
22. Each new and existing kiln that is used to process clay refractory products that is subject to the Hg limits specified in items 10.d. 11.d, 12.b, and 13.b of Table 1 to this subpart	Measure Hg emissions	Method 29 of 40 CFR part 60, appendix A-8	ASTM D6784-16[a] may be used as an alternative to EPA Method 29 (portion for Hg only).

For . . .	You must . . .	Using . . .	According to the following requirements . . .
23. Each new and existing kiln that is used to process clay refractory products and is equipped with an activated carbon injection system	Establish the operating limit for the average carbon flow rate	Data from the carbon flow rate measurement conducted during the Hg performance test	You must measure the carbon flow rate during each test run, determine and record the block average carbon flow rate values for the three test runs, and determine and record the 3-hour block average of the recorded carbon flow rate measurements for the three test runs. The average of the three test runs establishes your minimum site-specific activated carbon flow rate operating limit.
24. Each existing kiln that is used to process clay refractory products and is equipped with a FF and a bag leak detection system	Document conformance with specifications and requirements of the bag leak detection system	Data from the installation and calibration of the bag leak detection system	Submit analyses and supporting documentation demonstrating conformance with EPA guidance and specifications for bag leak detection systems as part of the Notification of Compliance Status.
25. Each existing kiln that is used to process clay refractory products and is equipped with a wet scrubber	a. Establish the operating limit for the minimum scrubber pressure drop	i. Data from the pressure drop measurement device during the performance test	(1) At least every 15 minutes, measure the pressure drop across the scrubber; and
			(2) Provide at least one pressure drop measurement during at least three 15-minute periods per hour of testing; and

For . . .	You must . . .	Using . . .	According to the following requirements . . .
			(3) Calculate the hourly average pressure drop across the scrubber for each hour of the performance test; and
			(4) Calculate and record the minimum pressure drop as the average of the hourly average pressure drops across the scrubber for the two or three test runs, whichever applies.
	b. Establish the operating limit for the minimum scrubber liquid flow rate	i. Data from the flow rate measurement device during the performance test	(1) At least every 15 minutes, measure the scrubber liquid flow rate; and
			(2) Provide at least one flow rate measurement during at least three 15-minute periods per hour of testing; and
			(3) Calculate the hourly average liquid flow rate for each hour of the performance test; and
			(4) Calculate and record the minimum liquid flow rate as the average of the hourly average liquid flow rates for the two or three test runs, whichever applies.

[a]Incorporated by reference, see §63.14.

21. Table 5 to Subpart SSSSS is revised to read as follows:

Table 5 to Subpart SSSSS of Part 63—Initial Compliance With Emission Limits

As stated in §63.9806, you must show initial compliance with the emission limits for affected sources according to the following table:

For . . .	For the following emission limit . . .	You have demonstrated compliance if . . .
1. Each affected source listed in Table 1 to this subpart	a. Each applicable emission limit listed in Table 1 to this subpart	i. Emissions measured using the test methods specified in Table 4 to this subpart satisfy the applicable emission limits specified in Table 1 to this subpart; and
		ii. You establish and have a record of the operating limits listed in Table 2 to this subpart over the performance test period; and
		iii. You report the results of the performance test in the Notification of Compliance Status, as specified by §63.9812(e)(1) and (2).
2. Each new or existing curing oven, shape dryer, and kiln that is used to process refractory products that use organic HAP; each new or existing coking oven and defumer that is used to produce pitch-impregnated refractory products; each new shape preheater that is used to produce pitch-impregnated refractory products; AND each new or existing process unit that is exhausted to a thermal or catalytic oxidizer that also controls emissions from an affected shape preheater or pitch working tank	As specified in items 3 through 8 of this table	You have satisfied the applicable requirements specified in items 3 through 8 of this table.
3. Each affected continuous process unit that is subject to the THC emission concentration limit listed in item 2.a., 3.a., 4, or 5 of Table 1 to this subpart	The average THC concentration must not exceed 20 ppmvd, corrected to 18 percent oxygen	The 3-hour block average THC emission concentration measured during the performance test using EPA Methods 25A and 3A is equal to or less than 20 ppmvd, corrected to 18 percent oxygen.

For . . .	For the following emission limit . . .	You have demonstrated compliance if . . .
4. Each affected continuous process unit that is subject to the THC percentage reduction limit listed in item 2.b. or 3.b. of Table 1 to this subpart	The average THC percentage reduction must equal or exceed 95 percent	The 3-hour block average THC percentage reduction measured during the performance test using EPA Method 25A is equal to or greater than 95 percent.
5. Each affected batch process unit that is subject to the THC emission concentration limit listed in item 6.a., 7.a., 8, or 9 of Table 1 to this subpart	The average THC concentration must not exceed 20 ppmvd, corrected to 18 percent oxygen	The 2-run block average THC emission concentration for the 3-hour peak emissions period measured during the performance test using EPA Methods 25A and 3A is equal to or less than 20 ppmvd, corrected to 18 percent oxygen.
6. Each affected batch process unit that is subject to the THC percentage reduction limit listed in item 6.b. or 7.b. of Table 1 to this subpart	The average THC percentage reduction must equal or exceed 95 percent	The 2-run block average THC percentage reduction for the 3-hour peak emissions period measured during the performance test using EPA Method 25A is equal to or exceeds 95 percent.
7. Each affected continuous or batch process unit that is equipped with a control device other than a thermal or catalytic oxidizer and is subject to the emission limit listed in item 3 or 7 of Table 1 to this subpart	a. The average THC concentration must not exceed 20 ppmvd, corrected to 18 percent oxygen; or b. The average THC percentage reduction must equal or exceed 95 percent	i. You have installed a THC CEMS at the outlet of the control device or in the stack of the affected source; and ii. You have satisfied the requirements of PS-8 of 40 CFR part 60, appendix B.
8. Each affected continuous or batch process unit that uses process changes to reduce organic HAP emissions and is subject to the emission limit listed in item 4 or 8 of Table 1 to this subpart	The average THC concentration must not exceed 20 ppmvd, corrected to 18 percent oxygen	i. You have installed a THC CEMS at the outlet of the control device or in the stack of the affected source; and ii. You have satisfied the requirements of PS-8 of 40 CFR part 60, appendix B.

For . . .	For the following emission limit . . .	You have demonstrated compliance if . . .
9. Each new continuous kiln that is used to process clay refractory products	a. The average HF emissions must not exceed 0.019 kg/Mg (0.038 lb/ton) of uncalcined clay processed; OR the average uncontrolled HF emissions must be reduced by at least 90 percent	i. The 3-hour block average production-based HF emissions rate measured during the performance test using one of the methods specified in item 14.a.i. of Table 4 to this subpart is equal to or less than 0.019 kg/Mg (0.038 lb/ton) of uncalcined clay processed; or
		ii. The 3-hour block average HF emissions reduction measured during the performance test is equal to or greater than 90 percent.
	b. The average HCl emissions must not exceed 0.091 kg/Mg (0.18 lb/ton) of uncalcined clay processed; OR the average uncontrolled HCl emissions must be reduced by at least 30 percent	i. The 3-hour block average production-based HCl emissions rate measured during the performance test using one of the methods specified in item 14.a.i. of Table 4 to this subpart is equal to or less than 0.091 kg/Mg (0.18 lb/ton) of uncalcined clay processed; or
		ii. The 3-hour block average HCl emissions reduction measured during the performance test is equal to or greater than 30 percent.
	c. The average PM emissions must not exceed 1.4 kg/Mg (3.1 lb/hr)	i. The 3-hour block average PM emissions measured during the performance test using one of the methods specified in item 21 of Table 4 to this subpart is equal to or less than 1.4 kg/Mg (3.1 lb/hr).

For . . .	For the following emission limit . . .	You have demonstrated compliance if . . .
	d. The average Hg emissions must not exceed 6.1 µg/dscm at 18 percent oxygen	i. The 3-hour block average Hg emissions measured during the performance test using one of the methods specified in item 22 of Table 4 to this subpart is equal to or less than 6.1 µg/dscm at 18 percent oxygen.
10. Each new batch process kiln that is used to process clay refractory products	a. The average uncontrolled HF emissions must be reduced by at least 90 percent	The 2-run block average HF emission reduction measured during the performance test is equal to or greater than 90 percent.
	b. The average uncontrolled HCl emissions must be reduced by at least 30 percent	The 2-run block average HCl emissions reduction measured during the performance test is equal to or greater than 30 percent.
	c. The average PM emissions must not exceed 1.4 kg/Mg (3.1 lb/hr)	i. The 2-run block average PM emissions measured during the performance test using one of the methods specified in item 21 of Table 4 to this subpart is equal to or less than 1.4 kg/Mg (3.1 lb/hr).
	d. The average Hg emissions must not exceed 6.1 µg/dscm at 18 percent oxygen	i. The 2-run block average Hg emissions measured during the performance test using one of the methods specified in item 22 of Table 4 to this subpart is equal to or less than 6.1 µg/dscm at 18 percent oxygen.
11. Each existing continuous kiln that is used to produce clay refractory products on and after **[INSERT DATE 1 YEAR AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**	a. The average PM emissions must not exceed 4.3 kg/Mg (9.5 lb/hr)	i. The 3-hour block average PM emissions measured during the performance test using one of the methods specified in item 21 of Table 4 to this subpart is equal to or less than 4.3 kg/Mg (9.5 lb/hr).

For . . .	For the following emission limit . . .	You have demonstrated compliance if . . .
	b. The average Hg emissions must not exceed 18 µg/dscm at 18 percent oxygen	i. The 3-hour block average Hg emissions measured during the performance test using one of the methods specified in item 22 of Table 4 to this subpart is equal to or less than 18 µg/dscm at 18 percent oxygen.
12. Each existing batch kiln that is used to produce clay refractory products on and after **[INSERT DATE 1 YEAR AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**	a. The average PM emissions must not exceed 4.3 kg/Mg (9.5 lb/hr)	i. The 2-run block average PM emissions measured during the performance test using one of the methods specified in item 21 of Table 4 to this subpart is equal to or less than 4.3 kg/Mg (9.5 lb/hr).
	b. The average Hg emissions must not exceed 18 µg/dscm at 18 percent oxygen	i. The 2-run block average Hg emissions measured during the performance test using one of the methods specified in item 22 of Table 4 to this subpart is equal to or less than 18 µg/dscm at 18 percent oxygen.

22. Table 6 to Subpart SSSSS is revised to read as follows:

Table 6 to Subpart SSSSS of Part 63—Initial Compliance With Work Practice Standards

As stated in §63.9806, you must show initial compliance with the work practice standards for affected sources according to the following table:

For each . . .	For the following standard . . .	You have demonstrated initial compliance if . . .
1. Each affected source listed in Table 3 to this subpart	a. Each applicable work practice standard listed in Table 3 to this subpart	i. You have selected a method for performing each of the applicable work practice standards listed in Table 3 to this subpart; and

For each . . .	For the following standard . . .	You have demonstrated initial compliance if . . .
		ii. You have included in your Initial Notification a description of the method selected for complying with each applicable work practice standard, as required by §63.9(b); and
		iii. You submit a signed statement with the Notification of Compliance Status that you have implemented the applicable work practice standard listed in Table 3 to this subpart; and
		iv. You have described in your OM&M plan the method for complying with each applicable work practice standard specified in Table 3 to this subpart.
2. Each basket or container that is used for holding fired refractory shapes in an existing shape preheater and autoclave during the pitch impregnation process	a. Control POM emissions from any affected shape preheater	i. You have implemented at least one of the work practice standards listed in item 1 of Table 3 to this subpart; and
		ii. You have established a system for recording the date and cleaning method for each time you clean an affected basket or container.
3. Each affected new or existing pitch working tank	Control POM emissions	You have captured and vented emissions from the affected pitch working tank to the device that is used to control emissions from an affected defumer or coking oven, or to a thermal or catalytic oxidizer that is comparable to the control device used on an affected defumer or coking oven.
4. Each new or existing chromium refractory products kiln	Minimize fuel-based HAP emissions	You use natural gas, or equivalent, as the kiln fuel.
5. Each existing clay refractory products kiln	Minimize fuel-based HAP emissions	You use natural gas, or equivalent, as the kiln fuel.

For each . . .	For the following standard . . .	You have demonstrated initial compliance if . . .
6. Each new or existing curing oven, shape dryer, and kiln that is used to process refractory products that use organic HAP, on and after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**	Minimize fuel-based HAP emissions	You use natural gas, or equivalent, as the kiln fuel.

23. Table 7 to Subpart SSSSS is revised to read as follows:

Table 7 to Subpart SSSSS of Part 63—Continuous Compliance with Emission Limits

As stated in §63.9810, you must show continuous compliance with the emission limits for affected sources according to the following table:

For . . .	For the following emission limit . . .	You must demonstrate continuous compliance by . . .
1. Each affected source listed in Table 1 to this subpart	a. Each applicable emission limit listed in Table 1 to this subpart	i. Collecting and recording the monitoring and process data listed in Table 2 (operating limits) to this subpart; and
		ii. Reducing the monitoring and process data associated with the operating limits specified in Table 2 to this subpart; and
		iii. Recording the results of any control device inspections; and
		iv. Reporting, in accordance with §63.9814(e), any deviation from the applicable operating limits specified in Table 2 to this subpart.

For . . .	For the following emission limit . . .	You must demonstrate continuous compliance by . . .
2. Each new or existing curing oven, shape dryer, and kiln that is used to process refractory products that use organic HAP; each new or existing coking oven and defumer that is used to produce pitch-impregnated refractory products; each new shape preheater that is used to produce pitch-impregnated refractory products; AND each new or existing process unit that is exhausted to a thermal or catalytic oxidizer that also controls emissions from an affected shape preheater or pitch working tank	As specified in items 3 through 7 of this table	Satisfying the applicable requirements specified in items 3 through 7 of this table.
3. Each affected process unit that is equipped with a thermal or catalytic oxidizer	a. The average THC concentration must not exceed 20 ppmvd, corrected to 18 percent oxygen; OR the average THC percentage reduction must equal or exceed 95 percent	i. Collecting the applicable data measured by the control device temperature monitoring system, as specified in items 5, 6, 8, and 9 of Table 8 to this subpart; and
		ii. Reducing the applicable data measured by the control device temperature monitoring system, as specified in items 5, 6, 8, and 9 of Table 8 to this subpart; and
		iii. Maintaining the average control device operating temperature for the applicable averaging period specified in items 5, 6, 8, and 9 of Table 2 to this subpart at or above the minimum allowable operating temperature established during the most recent performance test.

For . . .	For the following emission limit . . .	You must demonstrate continuous compliance by . . .
4. Each affected process unit that is equipped with a control device other than a thermal or catalytic oxidizer	The average THC concentration must not exceed 20 ppmvd, corrected to 18 percent oxygen; OR the average THC performance reduction must equal or exceed 95 percent	Operating and maintaining a THC CEMS at the outlet of the control device or in the stack of the affected source, according to the requirements of Procedure 1 of 40 CFR part 60, appendix F.
5. Each affected process unit that uses process changes to meet the applicable emission limit	The average THC concentration must not exceed 20 ppmvd, corrected to 18 percent oxygen	Operating and maintaining a THC CEMS at the outlet of the control device or in the stack of the affected source, according to the requirements of Procedure 1 of 40 CFR part 60, appendix F.
6. Each affected continuous process unit	The average THC concentration must not exceed 20 ppmvd, corrected to 18 percent oxygen; OR the average THC percentage reduction must equal or exceed 95 percent	Recording the organic HAP processing rate (pounds per hour) and the operating temperature of the affected source, as specified in items 3.b. and 3.c. of Table 4 to this subpart.
7. Each affected batch process unit	The average THC concentration must not exceed 20 ppmvd, corrected to 18 percent oxygen; OR the average THC percentage reduction must equal or exceed 95 percent	Recording the organic HAP processing rate (pounds per batch); and process cycle time for each batch cycle; and hourly average operating temperature of the affected source, as specified in items 8.b. through 8.d. of Table 4 to this subpart.
8. Each new kiln that is used to process clay refractory products	As specified in items 9 through 11 of this table	Satisfying the applicable requirements specified in items 9 through 11 of this table.

For . . .	For the following emission limit . . .	You must demonstrate continuous compliance by . . .
9. Each new affected kiln that is equipped with a DLA	a. The average HF emissions must not exceed 0.019 kg/Mg (0.038 lb/ton) of uncalcined clay processed, OR the average uncontrolled HF emissions must be reduced by at least 90 percent; and b. The average HCl emissions must not exceed 0.091 kg/Mg (0.18 lb/ton) of uncalcined clay processed, or the average uncontrolled HCl emissions must be reduced by at least 30 percent	i. Maintaining the pressure drop across the DLA at or above the minimum levels established during the most recent performance test; and ii. Verifying that the limestone hopper contains an adequate amount of free-flowing limestone by performing a daily visual check of the limestone in the feed hopper; and iii. Recording the limestone feeder setting daily to verify that the feeder setting is at or above the level established during the most recent performance test; and iv. Using the same grade of limestone as was used during the most recent performance test and maintaining records of the source and grade of limestone.
	c. The average PM emissions must not exceed 1.4 kg/Mg (3.1 lb/hr); and d. The average Hg emissions must not exceed 6.1 µg/dscm, corrected to 18 percent oxygen	i. Performing VE observations of the stack at the frequency specified in §63.9810(f) using EPA Method 22 of 40 CFR part 60, appendix A-7; maintaining no VE from the stack.

For . . .	For the following emission limit . . .	You must demonstrate continuous compliance by . . .
10. Each new affected kiln that is equipped with a DIFF or DLS/FF	a. The average HF emissions must not exceed 0.019 kg/Mg (0.038 lb/ton) of uncalcined clay processed; OR the average uncontrolled HF emissions must be reduced by at least 90 percent; and b. The average HCl emissions must not exceed 0.091 kg/Mg (0.18 lb/ton) of uncalcined clay processed; OR the average uncontrolled HCl emissions must be reduced by at least 30 percent; and c. The average PM emissions must not exceed 1.4 kg/Mg (3.1 lb/hr); and d. The average Hg emissions must not exceed 6.1 µg/dscm, corrected to 18 percent oxygen	i. Verifying at least once each 8-hour shift that lime is free-flowing by means of a visual check, checking the output of a load cell, carrier gas/lime flow indicator, or carrier gas pressure drop measurement system; and ii. Recording feeder setting daily to verify that the feeder setting is at or above the level established during the most recent performance test; and iii. Initiating corrective action within 1 hour of a bag leak detection system alarm AND completing corrective actions in accordance with the OM&M plan, AND operating and maintaining the fabric filter such that the alarm does not engage for more than 5 percent of the total operating time in a 6-month block reporting period.

For . . .	For the following emission limit . . .	You must demonstrate continuous compliance by . . .
11. Each new affected kiln that is equipped with a wet scrubber	a. The average HF emissions must not exceed 0.019 kg/Mg (0.038 lb/ton) of uncalcined clay processed; OR the average uncontrolled HF emissions must be reduced by at least 90 percent; and b. The average HCl emissions must not exceed 0.091 kg/Mg (0.18 lb/ton) of uncalcined clay processed; OR the average uncontrolled HCl emissions must be reduced by at least 30 percent; and c. The average PM emissions must not exceed 1.4 kg/Mg (3.1 lb/hr); and d. The average Hg emissions must not exceed 6.1 µg/dscm, corrected to 18 percent oxygen	i. Maintaining the pressure drop across the scrubber, liquid pH, and liquid flow rate at or above the minimum levels established during the most recent performance test; and ii. If chemicals are added to the scrubber liquid, maintaining the average chemical feed rate at or above the minimum chemical feed rate established during the most recent performance test.
12. Each new affected kiln that is equipped with an activated carbon injection system	The average Hg emissions must not exceed 6.1 µg/dscm, corrected to 18 percent oxygen	Collecting the carbon flow rate data according to §63.9804(a); reducing the carbon flow rate data to 3-hour block averages according to §63.9804(a); maintaining the average carbon flow rate for each 3-hour block period at or above the average carbon flow rate established during the Hg performance test in which compliance was demonstrated.

For . . .	For the following emission limit . . .	You must demonstrate continuous compliance by . . .
13. Each existing affected kiln that is equipped with a DLA or no add-on control	a. The average PM emissions must not exceed 4.3 kg/Mg (9.5 lb/hr); and b. The average Hg emissions must not exceed 18 µg/dscm, corrected to 18 percent oxygen	i. Performing VE observations of the stack at the frequency specified in §63.9810(f) using EPA Method 22 of 40 CFR part 60, appendix A-7; maintaining no VE from the stack.
14. Each existing affected kiln that is equipped with a DIFF or DLS/FF	a. The average PM emissions must not exceed 4.3 kg/Mg (9.5 lb/hr)	i. If you use a bag leak detection system, as prescribed in §63.9804(f), initiating corrective action within 1 hour of a bag leak detection system alarm AND completing corrective actions in accordance with the OM&M plan, AND operating and maintaining the fabric filter such that the alarm does not engage for more than 5 percent of the total operating time in a 6-month block reporting period; OR
		ii. Performing VE observations of the stack at the frequency specified in §63.9810(f) using EPA Method 22 of 40 CFR part 60, appendix A-7; maintaining no VE from the stack.
15. Each existing affected kiln that is equipped with a wet scrubber	a. The average PM emissions must not exceed 4.3 kg/Mg (9.5 lb/hr); and b. The average Hg emissions must not exceed 18 µg/dscm, corrected to 18 percent oxygen	i. Maintaining the pressure drop across the scrubber and liquid flow rate at or above the minimum levels established during the most recent performance test.

For . . .	For the following emission limit . . .	You must demonstrate continuous compliance by . . .
16. Each existing affected kiln that is equipped with an activated carbon injection system	The average Hg emissions must not exceed 18 µg/dscm, corrected to 18 percent oxygen	Collecting the carbon flow rate data according to §63.9804(a); reducing the carbon flow rate data to 3-hour block averages according to §63.9804(a); maintaining the average carbon flow rate for each 3-hour block period at or above the average carbon flow rate established during the Hg performance test in which compliance was demonstrated.

24. Table 8 to Subpart SSSSS is revised to read as follows:

Table 8 to Subpart SSSSS of Part 63—Continuous Compliance with Operating Limits

As stated in §63.9810, you must show continuous compliance with the operating limits for affected sources according to the following table:

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
1. Each affected source listed in Table 2 to this subpart	a. Each applicable operating limit listed in Table 2 to this subpart.	i. Maintaining all applicable process and control device operating parameters within the limits established during the most recent performance test; and
		ii. Conducting annually an inspection of all duct work, vents, and capture devices to verify that no leaks exist and that the capture device is operating such that all emissions are properly vented to the control device in accordance with the OM&M plan.

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
2. Each affected continuous kiln used to manufacture refractory products that use organic HAP that is equipped with a THC control device	a. The operating limits specified in items 2.a. through 2.c. of Table 2 to this subpart	i. Operating the control device on the affected kiln during all times except during periods of approved scheduled maintenance, as specified in §63.9792(e); and
		ii. Before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, minimizing HAP emissions from the affected kiln during all periods of scheduled maintenance of the kiln control device when the kiln is operating and the control device is out of service; on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, minimizing HAP emissions during the period when the kiln is operating and the control device is out of service by complying with the applicable standard in Table 3 to this subpart; and
		iii. Minimizing the duration of all periods of scheduled maintenance of the kiln control device when the kiln is operating and the control device is out of service; on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the total time during which the kiln is operating and the control device is out of service for the each year on a 12-month rolling basis must not exceed 750 hours.

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
3. Each new or existing curing oven, shape dryer, and kiln that is used to process refractory products that use organic HAP; each new or existing coking oven and defumer that is used to produce pitch-impregnated refractory products; each new shape preheater that is used to produce pitch-impregnated refractory products; AND each new or existing process unit that is exhausted to a thermal or catalytic oxidizer that also controls emissions from an affected shape preheater or pitch working tank	As specified in items 4 through 9 of this table.	Satisfying the applicable requirements specified in items 4 through 9 of this table.
4. Each affected continuous process unit	Maintain process operating parameters within the limits established during the most recent performance test	i. Recording the organic HAP processing rate (pounds per hour); and
		ii. Recording the operating temperature of the affected source at least hourly; and
		iii. Maintaining the 3-hour block average organic HAP processing rate at or below the maximum organic HAP processing rate established during the most recent performance test.
5. Continuous process units that are equipped with a thermal oxidizer	Maintain the 3-hour block average operating temperature in the thermal oxidizer combustion chamber at or above the minimum allowable operating temperature established during the most recent performance test	i. Measuring and recording the thermal oxidizer combustion chamber temperature at least every 15 minutes; and

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
		ii. Calculating the hourly average thermal oxidizer combustion chamber temperature; and
		iii. Maintaining the 3-hour block average thermal oxidizer combustion chamber temperature at or above the minimum allowable operating temperature established during the most recent performance test; and
		iv. Reporting, in accordance with §63.9814(e), any 3-hour block average operating temperature measurements below the minimum allowable thermal oxidizer combustion chamber operating temperature established during the most recent performance test.
6. Continuous process units that are equipped with a catalytic oxidizer	a. Maintain the 3-hour block average temperature at the inlet of the catalyst bed at or above the minimum allowable catalyst bed inlet temperature established during the most recent performance test	i. Measuring and recording the temperature at the inlet of the catalyst bed at least every 15 minutes; and
		ii. Calculating the hourly average temperature at the inlet of the catalyst bed; and
		iii. Maintaining the 3-hour block average temperature at the inlet of the catalyst bed at or above the minimum allowable catalyst bed inlet temperature established during the most recent performance test; and

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
		iv. Reporting, in accordance with §63.9814(e), any 3-hour block average catalyst bed inlet temperature measurements below the minimum allowable catalyst bed inlet temperature established during the most recent performance; and
		v. Checking the activity level of the catalyst at least every 12 months and taking any necessary corrective action, such as replacing the catalyst, to ensure that the catalyst is performing as designed.
7. Each affected batch process unit	Maintain process operating parameters within the limits established during the most recent performance test	i. Recording the organic HAP processing rate (pounds per batch); and
		ii. Recording the hourly average operating temperature of the affected source; and
		iii. Recording the process cycle time for each batch cycle; and
		iv. Maintaining the organic HAP processing rate at or below the maximum organic HAP processing rate established during the most recent performance test.
8. Batch process units that are equipped with a thermal oxidizer	Maintain the hourly average temperature in the thermal oxidizer combustion chamber at or above the hourly average temperature established for the corresponding 1-hour period of the cycle during the most recent performance test	i. Measuring and recording the thermal oxidizer combustion chamber temperature at least every 15 minutes; and
		ii. Calculating the hourly average thermal oxidizer combustion chamber temperature; and

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
		iii. From the start of each batch cycle until 3 hours have passed since the process unit reached maximum temperature, maintaining the hourly average operating temperature in the thermal oxidizer combustion chamber at or above the minimum allowable operating temperature established for the corresponding period during the most recent performance test, as determined according to item 11 of Table 4 to this subpart; and
		iv. For each subsequent hour of the batch cycle, maintaining the hourly average operating temperature in the thermal oxidizer combustion chamber at or above the minimum allowable operating temperature established for the corresponding hour during the most recent performance test, as specified in item 13 of Table 4 to this subpart; and
		v. Reporting, in accordance with §63.9814(e), any temperature measurements below the minimum allowable thermal oxidizer combustion chamber temperature measured during the most recent performance test.
9. Batch process units that are equipped with a catalytic oxidizer	Maintain the hourly average temperature at the inlet of the catalyst bed at or above the corresponding hourly average temperature established for the corresponding 1-hour period of the cycle during the most recent performance test	i. Measuring and recording temperatures at the inlet of the catalyst bed at least every 15 minutes; and

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
		ii. Calculating the hourly average temperature at the inlet of the catalyst bed; and
		iii. From the start of each batch cycle until 3 hours have passed since the process unit reached maximum temperature, maintaining the hourly average operating temperature at the inlet of the catalyst bed at or above the minimum allowable bed inlet temperature established for the corresponding period during the most recent performance test, as determined according to item 12 of Table 4 to this subpart; and
		iv. For each subsequent hour of the batch cycle, maintaining the hourly average operating temperature at the inlet of the catalyst bed at or above the minimum allowable bed inlet temperature established for the corresponding hour during the most recent performance test, as specified in item 13 of Table 4 to this subpart; and
		v. Reporting, in accordance with §63.9814(e), any catalyst bed inlet temperature measurements below the minimum allowable bed inlet temperature measured during the most recent performance test; and
		vi. Checking the activity level of the catalyst at least every 12 months and taking any necessary corrective action, such as replacing the catalyst, to ensure that the catalyst is performing as designed.

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
10. Each new kiln that is used to process clay refractory products	As specified in items 11 through 13 of this table	Satisfying the applicable requirements specified in items 11 through 13 of this table.
11. Each new kiln that is equipped a DLA	a. Maintain the average pressure drop across the DLA for each 3-hour block period at or above the minimum pressure drop established during the most recent performance test	i. Collecting the DLA pressure drop data, as specified in item 18.a. of Table 4 to this subpart; and
		ii. Reducing the DLA pressure drop data to 1-hour and 3-hour block averages; and
		iii. Maintaining the 3-hour block average pressure drop across the DLA at or above the minimum pressure drop established during the most recent performance test.
	b. Maintain free-flowing limestone in the feed hopper, silo, and DLA	Verifying that the limestone hopper has an adequate amount of free-flowing limestone by performing a daily visual check of the limestone hopper.
	c. Maintain the limestone feeder setting at or above the level established during the most recent performance test	Recording the limestone feeder setting at least daily to verify that the feeder setting is being maintained at or above the level established during the most recent performance test.
	d. Use the same grade of limestone from the same source as was used during the most recent performance test	Using the same grade of limestone as was used during the most recent performance test and maintaining records of the source and grade of limestone.
	e. Maintain no VE from the stack	i. Performing VE observations of the stack at the frequency specified in §63.9810(f) using EPA Method 22 of 40 CFR part 60, appendix A-7; and
		ii. Maintaining no VE from the stack.

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
12. Each new kiln that is equipped with a DIFF or DLS/FF	a. Initiate corrective action within 1 hour of a bag leak detection system alarm and complete corrective actions in accordance with the OM&M plan; AND operate and maintain the fabric filter such that the alarm does not engage for more than 5 percent of the total operating time in a 6-month block reporting period	i. Initiating corrective action within 1 hour of a bag leak detection system alarm and completing corrective actions in accordance with the OM&M plan; and
		ii. Operating and maintaining the fabric filter such that the alarm does not engage for more than 5 percent of the total operating time in a 6-month block reporting period; in calculating this operating time fraction, if inspection of the fabric filter demonstrates that no corrective action is required, no alarm time is counted; if corrective action is required, each alarm shall be counted as a minimum of 1 hour; if you take longer than 1 hour to initiate corrective action, the alarm time shall be counted as the actual amount of time taken by you to initiate corrective action.
	b. Maintain free-flowing lime in the feed hopper or silo at all times for continuous injection systems; AND maintain feeder setting at or above the level established during the most recent performance test for continuous injection systems	i. Verifying at least once each 8-hour shift that lime is free-flowing via a load cell, carrier gas/lime flow indicator, carrier gas pressure drop measurement system, or other system; recording all monitor or sensor output, and if lime is found not to be free flowing, promptly initiating and completing corrective actions; and

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
		ii. Recording the feeder setting once each day of operation to verify that the feeder setting is being maintained at or above the level established during the most recent performance test.
13. Each new kiln that is used to process clay refractory products and is equipped with a wet scrubber	a. Maintain the average pressure drop across the scrubber for each 3-hour block period at or above the minimum pressure drop established during the most recent performance test	i. Collecting the scrubber pressure drop data, as specified in item 20.a. of Table 4 to this subpart; and
		ii. Reducing the scrubber pressure drop data to 1-hour and 3-hour block averages; and
		iii. Maintaining the 3-hour block average scrubber pressure drop at or above the minimum pressure drop established during the most recent performance test.
	b. Maintain the average scrubber liquid pH for each 3-hour block period at or above the minimum scrubber liquid pH established during the most recent performance test	i. Collecting the scrubber liquid pH data, as specified in item 20.b. of Table 4 to this subpart; and
		ii. Reducing the scrubber liquid pH data to 1-hour and 3-hour block averages; and
		iii. Maintaining the 3-hour block average scrubber liquid pH at or above the minimum scrubber liquid pH established during the most recent performance test.
	c. Maintain the average scrubber liquid flow rate for each 3-hour block period at or above the minimum scrubber liquid flow rate established during the most recent performance test	i. Collecting the scrubber liquid flow rate data, as specified in item 20.c. of Table 4 to this subpart; and

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
		ii. Reducing the scrubber liquid flow rate data to 1-hour and 3-hour block averages; and
		iii. Maintaining the 3-hour block average scrubber liquid flow rate at or above the minimum scrubber liquid flow rate established during the most recent performance test.
	d. If chemicals are added to the scrubber liquid, maintain the average scrubber chemical feed rate for each 3-hour block period at or above the minimum scrubber chemical feed rate established during the most recent performance test	i. Collecting the scrubber chemical feed rate data, as specified in item 20.d. of Table 4 to this subpart; and
		ii. Reducing the scrubber chemical feed rate data to 1-hour and 3-hour block averages; and
		iii. Maintaining the 3-hour block average scrubber chemical feed rate at or above the minimum scrubber chemical feed rate established during the most recent performance test.
14. Each new and existing affected kiln that is equipped with an activated carbon injection system	a. Maintain the average carbon flow rate for each 3-hour block period at or above the average carbon flow rate established during the Hg performance test in which compliance was demonstrated.	i. Collecting the carbon flow rate data, as specified in item 23 of Table 4 to this subpart; and
		ii. Reducing the carbon flow rate data to 3-hour block averages; and

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
		iii. Maintaining the average carbon flow rate for each 3-hour block period at or above the average carbon flow rate established during the Hg performance test in which compliance was demonstrated.
15. Each existing affected kiln that is equipped with a DLA or no add-on control	a. Maintain no VE from the stack	i. Performing VE observations of the stack at the frequency specified in §63.9810(f) using EPA Method 22 of 40 CFR part 60, appendix A-7; and
		ii. Maintaining no VE from the stack.
16. Each existing affected kiln that is equipped with a FF	a. Maintain no VE from the stack; OR	i. Performing VE observations of the stack at the frequency specified in §63.9810(f) using EPA Method 22 of 40 CFR part 60, appendix A-7; and
		ii. Maintaining no VE from the stack.
	b. Initiate corrective action within 1 hour of a bag leak detection system alarm and complete corrective actions in accordance with the OM&M plan; AND operate and maintain the fabric filter such that the alarm does not engage for more than 5 percent of the total operating time in a 6-month block reporting period	i. Initiating corrective action within 1 hour of a bag leak detection system alarm and completing corrective actions in accordance with the OM&M plan; and

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
		ii. Operating and maintaining the fabric filter such that the alarm does not engage for more than 5 percent of the total operating time in a 6-month block reporting period; in calculating this operating time fraction, if inspection of the fabric filter demonstrates that no corrective action is required, no alarm time is counted; if corrective action is required, each alarm shall be counted as a minimum of 1 hour; if you take longer than 1 hour to initiate corrective action, the alarm time shall be counted as the actual amount of time taken by you to initiate corrective action.
17. Each existing affected kiln that is equipped with a wet scrubber	a. Maintain the average pressure drop across the scrubber for each 3-hour block period at or above the minimum pressure drop established during the most recent performance test	i. Collecting the scrubber pressure drop data, as specified in item 25.a of Table 4 to this subpart; and
		ii. Reducing the scrubber pressure drop data to 1-hour and 3-hour block averages; and
		iii. Maintaining the 3-hour block average scrubber pressure drop at or above the minimum pressure drop established during the most recent performance test.
	b. Maintain the average scrubber liquid flow rate for each 3-hour block period at or above the minimum scrubber liquid flow rate established during the most recent performance test	i. Collecting the scrubber liquid flow rate data, as specified in item 25.b. of Table 4 to this subpart; and

For . . .	For the following operating limit . . .	You must demonstrate continuous compliance by . . .
		ii. Reducing the scrubber liquid flow rate data to 1-hour and 3-hour block averages; and
		iii. Maintaining the 3-hour block average scrubber liquid flow rate at or above the minimum scrubber liquid flow rate established during the most recent performance test.

25. Table 9 to Subpart SSSSS is revised to read as follows:

Table 9 to Subpart SSSSS of Part 63—Continuous Compliance With Work Practice Standards

As stated in §63.9810, you must show continuous compliance with the work practice standards for affected sources according to the following table:

For . . .	For the following work practice standard . . .	You must demonstrate continuous compliance by . . .
1. Each affected source listed in Table 3 to this subpart	Each applicable work practice requirement listed in Table 3 to this subpart	i. Performing each applicable work practice standard listed in Table 3 to this subpart; and
		ii. Maintaining records that document the method and frequency for complying with each applicable work practice standard listed in Table 3 to this subpart, as required by §§63.10(b) and 63.9816(c)(2).
2. Each basket or container that is used for holding fired refractory shapes in an existing shape preheater and autoclave during the pitch impregnation process	Control POM emissions from any affected shape preheater	i. Controlling emissions from the volatilization of residual pitch by implementing one of the work practice standards listed in item 1 of Table 3 to this subpart; and

For . . .	For the following work practice standard . . .	You must demonstrate continuous compliance by . . .
		ii. Recording the date and cleaning method each time you clean an affected basket or container.
3. Each new or existing pitch working tank	Control POM emissions	Capturing and venting emissions from the affected pitch working tank to the control device that is used to control emissions from an affected defumer or coking oven, or to a thermal or catalytic oxidizer that is comparable to the control device used on an affected defumer or coking oven.
4. Each new or existing chromium refractory products kiln	Minimize fuel-based HAP emissions	i. Before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, using natural gas, or equivalent, as the kiln fuel at all times except during periods of natural gas curtailment or supply interruption; on and after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, using natural gas, or equivalent, as the kiln fuel at all times; and
		ii. Before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, if you intend to use an alternative fuel, submitting a notification of alternative fuel use within 48 hours of the declaration of a period of natural gas curtailment or supply interruption, as defined in §63.9824; and
		iii. Before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, submitting a report of alternative fuel use within 10 working days after terminating the use of the alternative fuel, as specified in §63.9814(g).

For . . .	For the following work practice standard . . .	You must demonstrate continuous compliance by . . .
5. Each existing clay refractory products kiln	Minimize fuel-based HAP emissions	i. Before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, using natural gas, or equivalent, as the kiln fuel at all times except during periods of natural gas curtailment or supply interruption; on and after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, using natural gas, or equivalent, as the kiln fuel at all times; and
		ii. Before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, if you intend to use an alternative fuel, submitting a notification of alternative fuel use within 48 hours of the declaration of a period of natural gas curtailment or supply interruption, as defined in §63.9824; and
		iii. Before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, submitting a report of alternative fuel use within 10 working days after terminating the use of the alternative fuel, as specified in §63.9814(g).
6. Each affected continuous kiln used to manufacture refractory products that use organic HAP that is equipped with an emission control device for THC	Minimize organic HAP emissions	i. Operating the control device at all times unless you receive Administrator approval to take the control device out of service for scheduled maintenance, as specified in §63.9792(e); and
		ii. Minimizing HAP emissions during the period when the kiln is operating and the control device is out of service as specified in item 5 of Table 3 to this subpart; and

For . . .	For the following work practice standard . . .	You must demonstrate continuous compliance by . . .
		iii. On and after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, recording the actual hourly organic HAP processing rate for the kiln while the control device was out of service and the amount of product manufactured in the kiln while the control device was out of service; and
		iv. Recording the duration of each period when the kiln is operating and the control device is out of service and, on and after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the total amount of time per year on a 12-month rolling basis that the kiln has operated and the control device has been out of service.
7. Each new or existing curing oven, shape dryer, and kiln that is used to process refractory products that use organic HAP, on and after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**	Minimize fuel-based HAP emissions	Using natural gas, or equivalent, as the kiln fuel at all times.

26. Table 10 to Subpart SSSSS is revised to read as follows:

Table 10 to Subpart SSSSS of Part 63—Requirements for Reports

As stated in §63.9814, you must comply with the requirements for reports in the following table:

You must submit a(n) . . .	The report must contain . . .	You must submit the report . . .
1. Compliance report	The information in §63.9814(c) through (f)	Semiannually according to the requirements in §63.9814(a) through (f).

You must submit a(n) . . .	The report must contain . . .	You must submit the report . . .
2. Before [**INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**], immediate SSM report if you had a startup, shutdown, or malfunction during the reporting period that is not consistent with your SSMP On and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, immediate SSM report is not required	a. Actions taken for the event	By fax or telephone within 2 working days after starting actions inconsistent with the plan.
	b. The information in §63.10(d)(5)(ii)	By letter within 7 working days after the end of the event unless you have made alternative arrangements with the permitting authority.
3. Before [**INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**], report of alternative fuel use	The information in §63.9814(g) and items 4 and 5 of Table 9 to this subpart	If you are subject to the work practice standard specified in item 3 or 4 of Table 3 to this subpart, and you use an alternative fuel in the affected kiln, by letter within 10 working days after terminating the use of the alternative fuel.
4. Performance test report	The information in §63.7(g)	According to the requirements of §63.9814(h).
5. CMS performance evaluation, as required for CEMS	The information in §63.7(g)	According to the requirements of §63.9814(i).

27. Table 11 to Subpart SSSSS is revised to read as follows:

Table 11 to Subpart SSSSS of Part 63—Applicability of General Provisions to Subpart SSSSS

As stated in §63.9820, you must comply with the applicable General Provisions requirements according to the following table:

Citation	Subject	Brief description	Applies to subpart SSSSS
§63.1	Applicability		Yes.
§63.2	Definitions		Yes.
§63.3	Units and Abbreviations		Yes.
§63.4	Prohibited Activities	Compliance date; circumvention, severability	Yes.
§63.5	Construction/Reconstruction	Applicability; applications; approvals	Yes.
§63.6(a)	Applicability	General Provisions (GP) apply unless compliance extension; GP apply to area sources that become major	Yes.
§63.6(b)(1)-(4)	Compliance Dates for New and Reconstructed Sources	Standards apply at effective date; 3 years after effective date; upon startup; 10 years after construction or reconstruction commences for section 112(f)	Yes.
§63.6(b)(5)	Notification		Yes.
§63.6(b)(6)	[Reserved]		
§63.6(b)(7)	Compliance Dates for New and Reconstructed Area Sources That Become Major	Area sources that become major must comply with major source standards immediately upon becoming major, regardless of whether required to comply when they were area sources	Yes.

Citation	Subject	Brief description	Applies to subpart SSSSS
§63.6(c)(1)-(2)	Compliance Dates for Existing Sources	Comply according to date in subpart, which must be no later than 3 years after effective date; for section 112(f) standards, comply within 90 days of effective date unless compliance extension	Yes.
§63.6(c)(3)-(4)	[Reserved]		
§63.6(c)(5)	Compliance Dates for Existing Area Sources That Become Major	Area sources that become major must comply with major source standards by date indicated in subpart or by equivalent time period (for example, 3 years)	Yes.
§63.6(d)	[Reserved]		
§63.6(e)(1)-(2)	Operation & Maintenance	Operate to minimize emissions at all times; correct malfunctions as soon as practicable; requirements independently enforceable; information Administrator will use to determine if operation and maintenance requirements were met; see §63.9792(b) for general duty requirement.	Yes before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** No on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

Citation	Subject	Brief description	Applies to subpart SSSSS
§63.6(e)(3)	SSMP requirements		Yes before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** No on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.
§63.6(f)(1)	Compliance Except During SSM	You must comply with emission standards at all times except during SSM	No.
§63.6(f)(2)-(3)	Methods for Determining Compliance	Compliance based on performance test, operation and maintenance plans, records, inspection	Yes.
§63.6(g)(1)-(3)	Alternative Standard	Procedures for getting an alternative standard.	Yes.
§63.6(h)(1)-(9)	Opacity/Visible Emission (VE) Standards		Not applicable.
§63.6(i)(1)-(14)	Compliance Extension	Procedures and criteria for Administrator to grant compliance extension	Yes.
§63.6(j)	Presidential Compliance Exemption	President may exempt source category	Yes.

Citation	Subject	Brief description	Applies to subpart SSSSS
§63.7(a)(1)-(2)	Performance Test Dates	Dates for conducting initial performance testing and other compliance demonstrations; must conduct 180 days after first subject to rule	Yes.
§63.7(a)(3)	Section 114 Authority	Administrator may require a performance test under CAA section 114 at any time	Yes.
§63.7(b)(1)	Notification of Performance Test	Must notify Administrator 60 days before the test	Yes.
§63.7(b)(2)	Notification of Rescheduling	Must notify Administrator 5 days before scheduled date and provide rescheduled date	Yes.
§63.7(c)	Quality Assurance/Test Plan	Requirements; test plan approval procedures; performance audit requirements; internal and external QA procedures for testing	Yes.
§63.7(d)	Testing Facilities		Yes.
§63.7(e)(1)	Conditions for Conducting Performance Tests	See §63.9800.	No, §63.9800 specifies requirements.
§63.7(e)(2)	Conditions for Conducting Performance Tests	Must conduct according to subpart and EPA test methods unless Administrator approves alternative	Yes.
§63.7(e)(3)	Test Run Duration	Must have three test runs of at least 1 hour each; compliance is based on arithmetic mean of three runs; conditions when data from an additional test run can be used	Yes; Yes, except where specified in §63.9800 for batch process sources; Yes.

Citation	Subject	Brief description	Applies to subpart SSSSS
§63.7(f)	Alternative Test Method		Yes.
§63.7(g)	Performance Test Data Analysis		Yes, except this subpart specifies how and when the performance test and performance evaluation results are reported.
§63.7(h)	Waiver of Test		Yes.
§63.8(a)(1)	Applicability of Monitoring Requirements		Yes.
§63.8(a)(2)	Performance Specifications	Performance Specifications in appendix B of 40 CFR part 60 apply	Yes.
§63.8(a)(3)	[Reserved]		
§63.8(a)(4)	Monitoring with Flares		Not applicable.
§63.8(b)(1)	Monitoring	Must conduct monitoring according to standard unless Administrator approves alternative	Yes.
§63.8(b)(2)-(3)	Multiple Effluents and Multiple Monitoring Systems	Specific requirements for installing and reporting on monitoring systems	Yes.

Citation	Subject	Brief description	Applies to subpart SSSSS
§63.8(c)(1)	Continuous Monitoring System Operation and Maintenance	Maintenance consistent with good air pollution control practices	Yes before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** No on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.
§63.8(c)(2)-(3)	Monitoring System Installation	Must install to get representative emission and parameter measurements	Yes.
§63.8(c)(4)	CMS Requirements		No, §63.9808 specifies requirements.
§63.8(c)(5)	COMS Minimum Procedures		Not applicable.
§63.8(c)(6)	CMS Requirements		Applies only to sources required to install and operate a THC CEMS.
§63.8(c)(7)(i)(A)	CMS Requirements		Applies only to sources required to install and operate a THC CEMS.
§63.8(c)(7)(i)(B)	CMS Requirements		Applies only to sources required to install and operate a THC CEMS.
§63.8(c)(7)(i)(C)	CMS Requirements		Not applicable.
§63.8(c)(7)(ii)	CMS Requirements	Corrective action required when CMS is out of control	Yes.

Citation	Subject	Brief description	Applies to subpart SSSSS
§63.8(c)(8)	CMS Requirements		Yes.
§63.8(d)(1) and (2)	CMS Quality Control		Yes.
§63.8(d)(3)	Written procedures for CMS		No, §63.9794(a)(8) specifies requirements.
§63.8(e)	CMS Performance Evaluation		Applies only to sources required to install and operate a THC CEMS, except this subpart specifies how and when the performance evaluation results are reported.
§63.8(f)(1)-(5)	Alternative Monitoring Method		Yes.
§63.8(f)(6)	Alternative to Relative Accuracy Test		Yes.
§63.8(g)	Data Reduction		Applies only to sources required to install and operate a THC CEMS.
§63.9(a)	Notification Requirements		Yes.
§63.9(b)(1)-(5)	Initial Notifications		Yes.
§63.9(c)	Request for Compliance Extension		Yes.
§63.9(d)	Notification of Special Compliance Requirements for New Source		Yes.
§63.9(e)	Notification of Performance Test	Notify Administrator 60 days prior	Yes.
§63.9(f)	Notification of VE/Opacity Test		Not applicable.

Citation	Subject	Brief description	Applies to subpart SSSSS
§63.9(g)	Additional Notifications When Using CMS		Applies only to sources required to install and operate a THC CEMS.
§63.9(h)	Notification of Compliance Status		Yes.
§63.9(i)	Adjustment of Submittal Deadlines		Yes.
§63.9(j)	Change in Previous Information		Yes.
§63.9(k)	Notifications	Electronic reporting procedures	Yes, only as specified in §63.9(j)
§63.10(a)	Recordkeeping/Reporting		Yes.
§63.10(b)(1)	General Recordkeeping Requirements		Yes.
§63.10(b)(2)(i)-(ii)	Recordkeeping of Occurrence and Duration of Startups and Shutdowns and Failures to Meet Standards	See §63.9816	Yes before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** No on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.
§63.10(b)(2)(iii)	Recordkeeping Relevant to Maintenance of Air Pollution Control and Monitoring Equipment		Yes.

Citation	Subject	Brief description	Applies to subpart SSSSS
§63.10(b)(2)(iv)-(v)	Actions Taken to Minimize Emissions during SSM		Yes before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. No on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.
§63.10(b)(2)(vi)	Recordkeeping for CMS Malfunctions	See §63.9816(c)(5).	Yes before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].** No on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

Citation	Subject	Brief description	Applies to subpart SSSSS
§63.10(b)(2)(vii)-(xi)	Records	Measurements to demonstrate compliance with emission limitations; performance test, performance evaluation, and visible emission observation results; measurements to determine conditions of performance tests and performance evaluations	Yes.
§63.10(b)(2)(xii)	Records	Records when under waiver	Yes.
§63.10(b)(2)(xiii)	Records	Records when using alternative to relative accuracy test	Not applicable.
§63.10(b)(2)(xiv)	Records	All documentation supporting Initial Notification and Notification of Compliance Status	Yes.
§63.10(b)(3)	Records	Applicability Determinations	Yes.
§63.10(c)(1), (c)(5)-(6)	Additional Records for CMS		Yes.
§63.10(c)(2)-(4)	Records	Additional Records for CMS	Not applicable
§63.10(c)(7)-(8)	Records of excess emissions and parameter monitoring exceedances for CMS	§63.9816 specifies requirements.	No.
§63.10(c)(9)	Records	Additional Records for CMS	Not applicable
§63.10(c)(10)-(14)	Additional Records for CMS		Yes.

Citation	Subject	Brief description	Applies to subpart SSSSS
§63.10(c)(15)	Records Regarding the SSMP.		Yes before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].** No on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.
§63.10(d)(1)	General Reporting Requirements	Requirements for reporting	Yes.
§63.10(d)(2)	Report of Performance Test Results	When to submit to Federal or State authority	No. This subpart specifies how and when the performance test results are reported.
§63.10(d)(3)	Reporting Opacity or VE Observations		Not applicable.
§63.10(d)(4)	Progress Reports	Must submit progress reports on schedule if under compliance extension	Yes.

Citation	Subject	Brief description	Applies to subpart SSSSS
§63.10(d)(5)	SSM Reports	Contents and submission See §63.9814 (d) and (e) for malfunction reporting requirements.	Yes before **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** No on and after **[INSERT DATE 181 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.
§63.10(e)(1)-(2)	Additional CMS Reports		Applies only to sources required to install and operate a THC CEMS, except this subpart specifies how and when the performance evaluation results are reported.
§63.10(e)(3)	Reports		No, §63.9814 specifies requirements.
§63.10(e)(4)	Reporting COMS data		Not applicable.
§63.10(f)	Waiver for Recordkeeping/Reporting		Yes.
§63.11	Flares		Not applicable.
§63.12	Delegation		Yes.
§63.13	Addresses		Yes.
§63.14	Incorporation by Reference		Yes.

Citation	Subject	Brief description	Applies to subpart SSSSS
§63.15	Availability of Information and Confidentiality		Yes.
§63.16	Performance Track Provisions		Yes.

6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 63

[EPA-HQ-OAR-2020-0505, EPA-HQ-OAR-2020-0532; FRL-7523-03-OAR]

RIN 2060-AU66

National Emission Standards for Hazardous Air Pollutants: Carbon Black Production and Cyanide Chemicals Manufacturing Residual Risk and Technology Reviews, and Carbon Black Production Area Source Technology Review

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This action finalizes the residual risk and technology reviews (RTR) conducted for the Carbon Black Production and Cyanide Chemicals Manufacturing major source categories, and the technology review conducted for Carbon Black Production area sources, regulated under National Emission Standards for Hazardous Air Pollutants (NESHAP). In addition, we are taking final action to add new emissions standards for the Carbon Black Production and Cyanide Chemicals Manufacturing major source categories to address hazardous air pollutant (HAP) emissions not previously covered by these NESHAP. The EPA is also finalizing amendments for both source categories that address the startup, shutdown, and malfunction (SSM) provisions of the existing standards, and require electronic reporting of certain notifications, performance test results, and semiannual reports.

DATES: These final rules are effective on **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The incorporation by reference (IBR) of certain publications listed in

the final rule is approved by the Director of the Federal Register as of **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: The U.S. Environmental Protection Agency (EPA) has established a docket for the Carbon Black Production source category under Docket ID No. EPA-HQ-OAR-2020-0505, and a docket for the Cyanide Chemicals Manufacturing source category under Docket ID EPA-HQ-OAR-2020-0532. All documents in the docket are listed on the *https://www.regulations.gov/* website. Although listed, some information is not publicly available, e.g., Confidential Business Information or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through *https://www.regulations.gov/,* or in hard copy at the EPA Docket Center, WJC West Building, Room Number 3334, 1301 Constitution Ave., NW, Washington, DC. The Public Reading Room hours of operation are 8:30 a.m. to 4:30 p.m. Eastern Standard Time (EST), Monday through Friday. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the EPA Docket Center is (202) 566-1742. Hand Deliveries and couriers may be received by scheduled appointment only. For further information and updates on EPA Docket Center services and the current status, please visit us online at *https://www.epa.gov/dockets*.

FOR FURTHER INFORMATION CONTACT: For questions about the Carbon Black Production source category final action, contact Korbin Smith, Sector Policies and Programs Division (D243-04), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541-2416; fax number: (919) 541-4991; and email address: *smith.korbin@epa.gov*. For questions

about the Cyanide Chemicals Manufacturing source category final action, contact Nathan Topham, Sector Policies and Programs Division (D243-02), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541-0483; fax number: (919) 541-4991; and email address: *topham.nathan@epa.gov*.

For specific information regarding the risk modeling methodology for both Carbon Black Production and Cyanide Chemicals Manufacturing, contact James Hirtz, Health and Environmental Impacts Division (C539-02), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541-0881; fax number: (919) 541-0840; and email address: *hirtz.james@epa.gov*.

SUPPLEMENTARY INFORMATION:

Preamble acronyms and abbreviations. We use multiple acronyms and terms in this preamble. While this list may not be exhaustive, to ease the reading of this preamble and for reference purposes, the EPA defines the following terms and acronyms here:

CAA	Clean Air Act
CCD	combustion control device
CCMPU	cyanide chemicals manufacturing process unit
CDX	Central Data Exchange
CEDRI	Compliance and Emissions Data Reporting Interface
CFR	Code of Federal Regulations
CO	carbon monoxide
CRA	Congressional Review Act
EAV	equivalent annual value
EPA	U.S. Environmental Protection Agency
GMACT	Generic Maximum Achievable Control Technology
HAP	hazardous air pollutant(s)
HCN	hydrogen cyanide
HON	Hazardous Organic NESHAP
HQ	hazard quotient
ICBA	International Carbon Black Association
ICR	Information Collection Request
LEL	lower explosive limit

MACT	maximum achievable control technology
MUF	main unit filter
NAICS	North American Industry Classification System
NATA	National Air Toxics Assessment
NESHAP	national emission standards for hazardous air pollutants
NOCS	Notification of Compliance Status
NSPS	New Source Performance Standards
OAQPS	Office of Air Quality Planning and Standards
OMB	Office of Management and Budget
PEL	permissible exposure limit
ppm	parts per million
ppmv	parts per million by volume
ppmw	parts per million by weight
PRA	Paperwork Reduction Act
PV	present value
REL	reference exposure level
RFA	Regulatory Flexibility Act
RTR	residual risk and technology review
SSM	startup, shutdown, and malfunction
SSP	startup and shutdown plan
STEL	short term exposure limit
TOSHI	target organ-specific hazard index
tpy	tons per year

Background information. On January 14, 2021, the EPA proposed revisions to the Carbon Black Production NESHAP based on our RTR, and proposed no revisions to the Carbon Black Production area source rule based on our technology review. On January 15, 2021, the EPA proposed revisions to the Cyanide Chemicals Manufacturing NESHAP based on our RTR. In this action, we are finalizing decisions for, and revisions of, the NESHAP for these source categories. We summarize some of the more significant comments we timely received regarding the proposed rules and provide our responses in this preamble. A summary of all other public comments on these proposals and the EPA's responses to those comments are available in the *Summary of Comments and EPA's Responses on the National Emission Standards for Hazardous Air Pollutants Carbon Black Production Residual Risk and Technology Review and Carbon Black Production Area Sources Technology Review Proposed Rule* (see

Docket ID No. EPA-HQ-OAR-2020-0505) for the Carbon Black Production source category, and *Summary of Comments and EPA's Responses on the National Emission Standards for Hazardous Air Pollutants: Cyanide Chemicals Manufacturing Residual Risk and Technology Review Proposed Rule* (see Docket ID No. EPA-HQ-OAR-2020-0532) for the Cyanide Chemicals Manufacturing source category. "Track changes" versions of the regulatory language that incorporates the changes in this action are available in the dockets.

Organization of this document. The information in this preamble is organized as follows:

I. General Information
A. Does this action apply to me?
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I. General Information

A. Does this action apply to me?

Regulated entities. The source categories that are the subject of this final action are cyanide chemicals manufacturing and carbon black production major sources regulated under 40 CFR part 63, subpart YY and carbon black production area sources regulated under 40 CFR part 63, subpart MMMMMM. The North American Industry Classification System (NAICS) codes for the cyanide chemicals manufacturing industry are 325188 and 325199. The NAICS code for the carbon black production industry is 325182.

This list of categories and NAICS codes is not intended to be exhaustive, but rather to provide a guide for readers regarding entities likely to be affected by the final action for the source categories listed. To determine whether your facility is affected, you should examine the applicability criteria in the appropriate NESHAP. If you have any questions regarding the applicability of any aspect of these NESHAP, please contact the appropriate person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section of this preamble.

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

In addition to being available in the dockets for these source categories, an electronic copy of this final action will also be available on the Internet. Following signature by the EPA Administrator, the EPA will post a copy of this final action at *https://www.epa.gov/stationary-sources-air-pollution/acetal-resins-acrylic-modacrylic-fibers-carbon-black-hydrogen*. Following publication in the *Federal Register*, the EPA will post the *Federal Register* version of the final rule and key technical documents at this same website.

Additional information is available on the RTR website at *https://www3.epa.gov/ttn/atw/rrisk/rtrpg.html*. This information includes an overview of the RTR program, links to project websites for the RTR source categories, and detailed emissions and other data we used as inputs to the risk assessments.

C. Judicial Review and Administrative Reconsideration

Under Clean Air Act (CAA) section 307(b)(1), judicial review of this final action is available only by filing a petition for review in the United States Court of Appeals for the District of Columbia Circuit (the Court) by **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Under CAA section 307(b)(2), the

requirements established by these final rules may not be challenged separately in any civil or criminal proceedings brought by the EPA to enforce the requirements.

Section 307(d)(7)(B) of the CAA further provides that only an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review. This section also provides a mechanism for the EPA to reconsider the rule if the person raising an objection can demonstrate to the Administrator that it was impracticable to raise such objection within the period for public comment or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule. Any person seeking to make such a demonstration should submit a Petition for Reconsideration to the Office of the Administrator, U.S. EPA, Room 3000, WJC South Building, 1200 Pennsylvania Ave. NW, Washington, DC 20460, with a copy to both the person(s) listed in the preceding **FOR FURTHER INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), U.S. EPA, 1200 Pennsylvania Ave. NW, Washington, DC 20460.

II. Background

A. What is the statutory authority for this action?

Section 112 of the CAA establishes a two-stage regulatory process to address emissions of HAP from stationary sources. In the first stage, we must identify categories of sources emitting one or more of the HAP listed in CAA section 112(b) and then promulgate technology-based NESHAP for those sources. "Major sources" are those that emit, or have the potential to emit, any single HAP at a rate of 10 tons per year (tpy) or more, or 25 tpy or more of any combination of HAP. For major sources, these standards are commonly referred to as maximum

achievable control technology (MACT) standards and must reflect the maximum degree of emission reductions of HAP achievable (after considering cost, energy requirements, and non-air quality health and environmental impacts). In developing MACT standards, CAA section 112(d)(2) directs the EPA to consider the application of measures, processes, methods, systems, or techniques, including, but not limited to, those that reduce the volume of or eliminate HAP emissions through process changes, substitution of materials, or other modifications; enclose systems or processes to eliminate emissions; collect, capture, or treat HAP when released from a process, stack, storage, or fugitive emissions point; are design, equipment, work practice, or operational standards; or any combination of the above.

For these MACT standards, the statute specifies certain minimum stringency requirements, which are referred to as MACT floor requirements, and which may not be based on cost considerations. See CAA section 112(d)(3). For new sources, the MACT floor cannot be less stringent than the emission control achieved in practice by the best-controlled similar source. The MACT standards for existing sources can be less stringent than floors for new sources, but they cannot be less stringent than the average emission limitation achieved by the best-performing 12 percent of existing sources in the category or subcategory (or the best-performing five sources for categories or subcategories with fewer than 30 sources). In developing MACT standards, we must also consider control options that are more stringent than the floor under CAA section 112(d)(2). We may establish standards more stringent than the floor, based on the consideration of the cost of achieving the emissions reductions, any non-air quality health and environmental impacts, and energy requirements.

In the second stage of the regulatory process, the CAA requires the EPA to undertake two different analyses, which we refer to as the technology review and the residual risk review.

Under the technology review, we must review the technology-based standards and revise them "as necessary (taking into account developments in practices, processes, and control technologies)" no less frequently than every 8 years, pursuant to CAA section 112(d)(6). The EPA is required to address regulatory gaps, such as missing standards for listed air toxics known to be emitted from the source category. *Louisiana Environmental Action Network (LEAN) v. EPA*, 955 F.3d 1088 (D.C. Cir. 2020). Under the residual risk review, we must evaluate the risk to public health remaining after application of the technology-based standards and revise the standards, if necessary, to provide an ample margin of safety to protect public health or to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect. The residual risk review is required within 8 years after promulgation of the technology-based standards, pursuant to CAA section 112(f). In conducting the residual risk review, if the EPA determines that the current standards provide an ample margin of safety to protect public health, it is not necessary to revise the MACT standards pursuant to CAA section 112(f).[1] For more information on the statutory authority for this action, see 86 FR 3054, for the Carbon Black Production NESHAP and 86 FR 3906, for the Cyanide Chemicals Manufacturing NESHAP.

B. What are the source categories and how do the current NESHAP regulate HAP emissions from the source categories?

The MACT standards for both the Carbon Black Production and Cyanide Chemicals Manufacturing source categories are contained in the Generic Maximum Achievable Control

[1] The Court has affirmed this approach of implementing CAA section 112(f)(2)(A): NRDC v. EPA, 529 F.3d 1077, 1083 (DC Cir. 2008) ("If EPA determines that the existing technology-based standards provide an 'ample margin of safety,' then the Agency is free to readopt those standards during the residual risk rulemaking.").

Technology (GMACT) NESHAP, which also includes MACT standards for several other source categories. Section II.B.1 of this preamble discusses the current Carbon Black Production major and area source rules and section II.B.2 discusses the Cyanide Chemicals Manufacturing source category standards.

1. Carbon Black Production

The EPA promulgated the Carbon Black Production NESHAP for major sources on July 12, 2002 (67 FR 46258). The major source standards are codified at 40 CFR part 63, subpart YY. Additionally, the Carbon Black Production area source NESHAP was promulgated on July 16, 2007 (72 FR 38864). The area source standards are codified at 40 CFR part 63, subpart MMMMMM. Subpart MMMMMM was subsequently amended by a direct final rule on March 26, 2008 (73 FR 15923). As promulgated, the Carbon Black Production major source and area source NESHAP apply to carbon black production facilities that are, respectively, major sources and area sources of HAP. The affected source covered by the major and area source subparts is each new, reconstructed, or existing facility that produces carbon black by either the furnace, thermal, acetylene decomposition, or lampblack processes. The source category covered by this MACT standard currently includes 15 major source facilities; no area source facilities were identified.

Emissions limits in the 2002 major source NESHAP for the Carbon Black Production source category were set for process vents associated with the main unit filter (MUF). Process vents at the MUF that have a HAP concentration of equal to or greater than 260 parts per million by volume (ppmv) are required to reduce emissions of HAP by the use of a flare meeting the requirements of 40 CFR part 63, subpart SS, or reduce emissions of total HAP by 98 weight-percent or to a concentration of 20 ppmv, whichever is less stringent. The Carbon Black

Production area source NESHAP requires area source facilities to meet the requirements of the Carbon Black Production major source NESHAP found at 40 CFR 63.1103(f) of subpart YY.

2. Cyanide Chemicals Manufacturing

The EPA promulgated the Cyanide Chemicals Manufacturing NESHAP on July 12, 2002 (67 FR 46258). The standards are codified at 40 CFR part 63, subpart YY. The cyanide chemicals manufacturing industry consists of facilities producing hydrogen cyanide or sodium cyanide. The source category covered by this MACT standard currently includes 13 facilities. As promulgated in 2002, the cyanide chemicals manufacturing standards regulate HAP emissions from cyanide chemicals manufacturing units located at major sources. The HAP emitted from the source category include cyanide compounds (hydrogen cyanide and sodium cyanide), acetonitrile, and acrylonitrile.

The NESHAP defines the affected source as each cyanide chemicals manufacturing process unit (CCMPU). The rule states that the CCMPU is the equipment assembled and connected by hard-piping or duct work to process raw materials to manufacture, store, and transport a cyanide chemicals product. Section II.B of the proposed cyanide chemicals manufacturing RTR provides more information about the source category (86 FR 3906, 3910).

The 2002 NESHAP established emissions standards for process vents, storage vessels, transfer racks, equipment leaks, and some wastewater sources. Cyanide process vents are subject to either a 98 weight-percent reduction of total HAP[2] performance standard or a 20 ppmv total HAP outlet exit concentration limit. For storage vessels in the Cyanide Chemicals Manufacturing

[2] "Dry end" process vents at sodium cyanide units must meet a 98 percent reduction performance standard for emissions of sodium cyanide since this is the form of cyanide compounds emitted from these emission points. The HAP emitted from other process vents that make up the "total HAP" emitted from these sources are hydrogen cyanide, acetonitrile, and acrylonitrile.

source category, sources may either choose to comply with a 98 weight-percent reduction of hydrogen cyanide performance standard, a 20 ppmv hydrogen cyanide exit outlet concentration limit, or equipment standards (*e.g.*, use of a flare). Transfer racks are subject to either equipment standards or the same performance standard or concentration limit[3] as cyanide process vents. Equipment leaks are subject to work practice standards required by either 40 CFR part 63, subpart TT or subpart UU.

During development of the initial MACT standards, we identified process wastewater at existing sources as a potential source of emissions of hydrogen cyanide, acetonitrile, and acrylonitrile. See 65 FR 76408, 76411, and 76413, December 6, 2000, for a discussion of the HAP emitted from cyanide chemicals manufacturing. The 2002 NESHAP established requirements that HAP emissions from applicable process wastewater streams be controlled while the wastewater is being conveyed to treatment and specified requirements for the controls to reduce the hydrogen cyanide and acetonitrile concentration in the process wastewater. For a new CCMPU that generates process wastewater, the NESHAP requires a combined 93 weight-percent removal and control of HAP from process wastewater generated from hydrogen cyanide purification, ammonia purification, or flare blowdown. At the time the initial MACT standards were developed, we identified measures undertaken at cyanide chemicals manufacturing facilities to comply with other NESHAP as the "MACT floor" for process wastewater at existing sources, but we did not include these measures in subpart YY for existing CCMPUs. For a cyanide chemicals manufacturing process unit that generates maintenance wastewater, the

[3] Transfer racks emissions limits are expressed in terms of hydrogen cyanide as this is the only HAP emitted from these sources.

NESHAP requires that an owner or operator comply with Hazardous Organic NESHAP (HON) maintenance wastewater requirements.

C. What changes did we propose for the Carbon Black Production source category in our January 14, 2021, RTR proposal?

On January 14, 2021, the EPA published a proposed rule in the *Federal Register* for the Carbon Black Production NESHAP, 40 CFR part 63, subpart YY, that took into consideration the RTR analyses. In the proposed rule, we proposed to find that the risk from the source category is acceptable, the current standards provide an ample margin of safety to protect public health, and more stringent standards are not necessary to prevent an adverse environmental effect. Based on the technology review, we proposed that it is not necessary to revise the existing standards because we did not identify developments in practices, processes, or control technologies that would result in cost-effective emission reductions for the Carbon Black Production source category.

The EPA did, however, propose to broaden the scope of the original NESHAP, which applied to process vents associated with the MUF only, to include previously unregulated process vents associated with the carbon black production unit. The EPA proposed to require all process vents that have a HAP concentration of the emission stream equal to or greater than 260 ppmv, including those located after the MUF, to reduce emissions of HAP by using a flare meeting the requirements of 40 CFR part 63, subpart SS, or to reduce emissions of total HAP by 98 weight-percent or to a concentration of 20 ppmv, whichever is less stringent. The EPA also proposed to require facilities to conduct performance testing on the additional process vents located after the MUF.

The proposal preamble also stated that the EPA did not identify any currently operating area sources in the carbon black production source category. The EPA is not proposing to change the existing area source standards. However, the area source standard requires all facilities to meet all the requirements in 40 CFR 63.1103(f) of subpart YY (major source standard). The provisions in 40 CFR 63.1103(f) include carbon black production applicability, definitions, and requirements. Therefore, all changes discussed below, which impact the requirements laid out in 40 CFR 63.1103(f), also impact the requirements of the area source rule for carbon black production.

The EPA proposed the following amendments to the Carbon Black Production major source NESHAP:

- Expansion of the process vent emission standards to cover all applicable (based on an applicability threshold) carbon black production process vents;
- A requirement for boilers/process heaters that receive tail gas for use as fuel gas to comply with annual tune-up requirements specified in 40 CFR 63.1103(f)(3)(iii);
- Addition of a work practice standard for periods of startup, as specified in 40 CFR 63.1103(f)(5);
- Revision of the MACT standard compliance provisions for the Carbon Black Production source category to require owners and operators of carbon black production process vent affected sources to conduct periodic performance tests every 5 years;
- Elimination of the startup, shutdown, malfunction (SSM) exemption, which currently appears at 40 CFR 63.1108, and any references to SSM requirements in subpart YY that apply to Carbon Black Production source category affected sources;

- Requirements for submission of electronic copies of required performance test reports, Notification of Compliance Status (NOCS), and periodic reports through the EPA's Central Data Exchange (CDX) using the Compliance and Emissions Data Reporting Interface (CEDRI); and
- Minor editorial and technical changes in the subpart.

D. What changes did we propose for the Cyanide Chemicals Manufacturing source category in our January 15, 2021, RTR proposal?

On January 15, 2021, the EPA published a proposed rule in the *Federal Register* for the Cyanide Chemicals Manufacturing NESHAP (86 FR 3906) that took into consideration the RTR analyses. In the proposed rule, we proposed to find that the risk from the source category is acceptable, the current standards provide an ample margin of safety to protect public health, and more stringent standards are not necessary to prevent an adverse environmental effect. Based on the technology review, we proposed that it is not necessary to revise the existing standards because we did not identify developments in practices, processes, or control technologies that would result in cost-effective emission reductions for the Cyanide Chemicals Manufacturing source category.

However, the EPA proposed standards pursuant to CAA section 112(d)(2) for process wastewater from existing CCMPUs, which was previously unregulated.[4] We proposed that process wastewater sources at existing sources comply with HON wastewater requirements. Specifically, for an existing cyanide chemicals manufacturing process unit that generates process

[4] The EPA not only has authority under CAA sections 112(d)(2) and (3) to set MACT standards for previously unregulated HAP emissions at any time but is required to address any previously unregulated HAP emissions as part of its periodic review of MACT standards under CAA section 112(d)(6). *LEAN v. EPA*, 955 F3d at 1091-1099.

wastewater from hydrogen cyanide purification, ammonia purification, or flare blowdown, we proposed that owners or operators comply with the requirements of 40 CFR 63.138(a)(1) of the HON if the total annual average concentration of Table 9 of 40 CFR part 63, subpart G compounds and cyanide compounds[5] is greater than or equal to 10,000 parts per million by weight (ppmw) at any flow rate, or the total annual average concentration of Table 9 compounds and cyanide compounds is greater than or equal to 1,000 ppmw, and the annual average flow rate is greater than or equal to 10 liters per minute (according to the procedures in 40 CFR 63.144(a)). We also proposed revising the new source standard to add the HON requirements for waste management units upstream of an open or closed biological treatment process to ensure demonstrable compliance measures are in place for these sources.

The EPA also proposed the following amendments:

- Revisions to the MACT rule at 40 CFR 63.1108 through 40 CFR 63.1112 to eliminate references to SSM requirements in subpart YY to reduce confusion that may result from referenced subparts associated with the GMACT that may contain SSM exemptions for other source categories;
- Requirements for submission of electronic copies of required performance test reports, NOCS, and periodic reports through the EPA's CDX using CEDRI; and
- Minor editorial and technical changes in the subpart.

III. What is included in these final rules?

[5] In the final rule, we have clarified that this requirement applies to "free cyanide" rather than "cyanide compounds" in response to public comments.

This action finalizes the EPA's determinations pursuant to the RTR provisions of CAA section 112 for the Carbon Black Production and Cyanide Chemicals Manufacturing source categories.

For the Carbon Black Production source category, this action finalizes changes to the major source NESHAP, including elimination of the SSM exemption and any reference to SSM requirements for carbon black production facilities, inclusion of a work practice standard for startup and shutdown periods, inclusion of boiler and process heater annual tune-up requirements, expansion of process vent standard applicability, addition of periodic process vent performance testing requirements, inclusion of electronic reporting requirements, and editorial and technical changes. This final action also reflects several changes to the RTR proposal in consideration of comments received during the public comment period. Section IV presents our rationale for our final decisions and changes to the proposed amendments based on comments received on the proposal.

For the Cyanide Chemicals Manufacturing source category, this action finalizes changes to the NESHAP, including: eliminating any reference to SSM exemptions for cyanide chemicals manufacturing facilities, adding electronic reporting requirements, adding HON requirements for process wastewater from existing cyanide chemical manufacturing process units, adding HON requirements for waste management units upstream of an open or closed biological treatment process to the new source standard, and making editorial/technical changes. This action also reflects several changes to the RTR proposal in consideration of comments received during the public comment period as described in section V of this preamble.

A. What are the final rule amendments based on the risk reviews for the Carbon Black Production and Cyanide Chemicals Manufacturing source categories?

This section introduces the final determinations for the Carbon Black Production and Cyanide Chemicals Manufacturing NESHAP pursuant to CAA section 112(f). Section III.A.1 presents the final decisions based on the risk review for the Carbon Black Production source category. Section III.A.2 presents the final decisions based on the risk review for the Cyanide Chemicals Manufacturing source category.

1. Carbon Black Production

The EPA is not amending the major source Carbon Black Production NESHAP based on the risk reviews conducted pursuant to CAA section 112(f). In this action, we are finalizing our proposed determination that the risk from HAP emissions from the Carbon Black Production source category is acceptable, and that the standards provide an ample margin of safety to protect public health and prevent an adverse environmental effect.

2. Cyanide Chemicals Manufacturing

The EPA is not amending the Cyanide Chemicals Manufacturing NESHAP based on the risk review conducted pursuant to CAA section 112(f). In this action, we are finalizing our proposed determination that the risk from HAP emissions from the Cyanide Chemicals Manufacturing source category is acceptable, and that the standards provide an ample margin of safety to protect public health and prevent an adverse environmental effect.

B. What are the final rule amendments based on the technology reviews for the Carbon Black Production and Cyanide Chemicals Manufacturing source categories?

This section summarizes the results of the technology reviews for the Carbon Black Production and Cyanide Chemicals Manufacturing NESHAP. Section III.B.1 presents the final decisions based on the technology review for the Carbon Black Production source category.

Section III.B.2 presents the final decisions based on the technology review for the Cyanide Chemicals Manufacturing source category.

1. Carbon Black Production

We determined that there are no developments in practices, processes, and control technologies that warrant revisions to the MACT standards for this source category. Therefore, we are not finalizing revisions to the MACT standards for this source category under CAA section 112(d)(6). However, as part of the technology review, we identified regulatory gaps (previously unregulated processes or pollutants), and are establishing new standards to fill those gaps as described in section III.C of this preamble.

As discussed in the Carbon Black Production source category proposal preamble, we also performed a technology review of the Carbon Black Production area source NESHAP. As part of that review, the EPA did not identify any currently operating area source facilities. We are finalizing our conclusion that it is not necessary to make changes to the existing area source standards as a result of this review.

2. Cyanide Chemicals Manufacturing

We determined that there are no developments in practices, processes, and control technologies that warrant revisions to the MACT standards for this source category. Therefore, we are not finalizing revisions to the MACT standards for this source category under CAA section 112(d)(6). However, as part of the technology review, we identified regulatory gaps (previously unregulated processes or pollutants), and are establishing new standards to fill those gaps as described in section III.C of this preamble.

C. What are the final rule amendments pursuant to CAA sections 112(d)(2) and (3) for the Carbon Black Production and Cyanide Chemicals Manufacturing source categories?

This section describes the final rule amendments to the Carbon Black Production and Cyanide Chemicals Manufacturing NESHAP pursuant to CAA sections 112(d)(2) and (3). Section III.C.1 presents the final rule amendments for the Carbon Black Production source category. Section III.C.2 presents the final rule amendments for the Cyanide Chemicals Manufacturing source category.

1. Carbon Black Production

Pursuant to CAA sections 112(d)(2) and (3), the EPA is finalizing its proposal to broaden the scope of the current emission limits for new and existing sources in the major source NESHAP, which applies to process vents associated with the MUF, to include all process vents associated with the carbon black production unit. This amendment requires all process vents, including those located after the MUF that meet the applicability threshold, to reduce emissions of total HAP by 98 weight-percent or to a concentration of 20 ppmv, whichever is less stringent, by venting emissions through a closed vent system to any combination of control devices meeting the requirements of 40 CFR 63.982(a)(2). Additionally, these final amendments require facilities to conduct an applicability determination test on the additional process vents located after the MUF.

2. Cyanide Chemicals Manufacturing

Pursuant to CAA sections 112(d)(2) and (3), the EPA is finalizing its proposal to add standards for process wastewater at existing CCMPUs with minor applicability-related clarifications (see section V.D.3.d (Request for Clarification)). The final standards require that individual wastewater streams from CCMPU HCN purification, ammonia purification, or flare blowdown, comply with the requirements of 40 CFR 63.138(a)(1) of the HON if the total annual average concentration of Table 9 of 40 CFR part 63, subpart G compounds and free cyanide

from each process wastewater stream is greater than or equal to 10,000 ppmw at any flow rate, or the total annual average concentration of Table 9 compounds and free cyanide from each process wastewater stream is greater than or equal to 1,000 ppmw and the annual average flow rate is greater than or equal to 10 liters per minute (according to the procedures in 40 CFR 63.144(a)). The EPA is also finalizing its proposal to add the HON requirements for waste management units upstream of an open or closed biological treatment process for process wastewater at new sources.

D. What are the final rule amendments addressing emissions during periods of SSM for the Carbon Black Production and Cyanide Chemicals Manufacturing source categories?

This section describes the final rule amendments to the Carbon Black Production and Cyanide Chemicals Manufacturing NESHAP that address emissions during periods of SSM. Section III.D.1 presents the final rule amendments for the Carbon Black Production source category. Section III.D.2 presents the final rule amendments for the Cyanide Chemicals Manufacturing source category.

1. Carbon Black Production

The EPA is finalizing the proposed SSM provision amendments for the Carbon Black Production major source NESHAP in subpart YY in order to ensure consistency with the decision in *Sierra Club v. EPA*, 551 F. 3d 1019 (DC Cir. 2008). As noted in the proposal for the Carbon Black Production source category, under this decision, the Court vacated two provisions that exempted sources from the requirement to comply with otherwise applicable CAA section 112(d) emission standards during periods of SSM. We proposed and are finalizing revisions to the MACT rule at 40 CFR 63.1108 through 40 CFR 63.1112 that remove the SSM exemption under the Carbon Black Production NESHAP and any references to SSM-related requirements.

The EPA is also finalizing startup and shutdown work practice standards to address safety and combustibility concerns in the absence of the SSM exemption. The work practice standard, as amended under the final rule, is discussed in greater detail in section IV.C of this preamble.

2. Cyanide Chemicals Manufacturing

The EPA is finalizing the proposed SSM provision amendments for the Cyanide Chemicals Manufacturing NESHAP in order to ensure consistency with the decision in *Sierra Club v. EPA*, 551 F. 3d 1019 (DC Cir. 2008). The Cyanide Chemicals Manufacturing NESHAP promulgated in 2002 is consistent with the Court decision mentioned above. However, we proposed and are finalizing revisions to the NESHAP at 40 CFR 63.1108 through 40 CFR 63.1112 to ensure that no confusion results from referenced subparts in subpart YY that may contain SSM exemptions for other source categories. See section V.C of this preamble for more information regarding SSM provisions under subpart YY.

E. What other changes have been made to the NESHAP?

This section describes other amendments to the final Carbon Black Production and Cyanide Chemicals Manufacturing NESHAP. Section III.E.1 presents the other final rule amendments for the Carbon Black Production source category. Section III.E.2 presents the other final rule amendments for the Cyanide Chemicals Manufacturing source category.

1. Carbon Black Production

Other final amendments to the Carbon Black Production NESHAP include boiler and process heater annual tune-up requirements, electronic reporting requirements, and periodic performance testing requirements for process vents to demonstrate initial and continued compliance with the standards, as discussed below.

a. Boiler and Process Heater Annual Tune-Up Provisions

The EPA is finalizing annual tune-up requirements for boilers and process heaters that utilize tail gas for use as fuel. These provisions are specified in 40 CFR 63.1103(f)(3)(iii) of the final rule. To better reflect boilers and process heaters used in the carbon black production source category, the final annual boiler and process heater tune-up requirements were revised from the proposal, based on comments received (see section IV.D of this preamble for detail related to comments received, as well as the EPA's revisions and rationale).

b. Electronic Reporting Requirements

The EPA is finalizing its proposal that owners and operators of carbon black production facilities submit electronic copies of required performance test reports, NOCS, and periodic reports through the EPA's CDX using CEDRI. A description of the electronic data submission process is provided in the memorandum, "*Electronic Reporting Requirements for New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) Rules*", available in the docket for the Carbon Black Production NESHAP (see Docket ID No. EPA-HQ-OAR-2020-0505-0018).

c. Periodic Performance Testing

The EPA is finalizing rule amendments, as proposed, that require owners and operators of carbon black production process vents subject to the rule, in addition to the already required initial performance test, to conduct performance tests every 5 years to demonstrate continued compliance with the NESHAP.

2. Cyanide Chemicals Manufacturing

The EPA is finalizing its proposal that owners and operators of cyanide chemicals manufacturing facilities submit electronic copies of required performance test reports, NOCS,

and periodic reports through the EPA's CDX using CEDRI. A description of the electronic data submission process is provided in the memorandum, *Electronic Reporting Requirements for New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) Rules*, available in the docket for the Cyanide Chemicals Manufacturing NESHAP action (see Docket ID No. EPA-HQ-OAR-2020-0532-0003). Specific comments received on the proposed periodic report electronic data template and the EPA's response to those comments are provided in a memorandum to the docket, *Summary of Comments and EPA's Responses on the National Emission Standards for Hazardous Air Pollutants: Cyanide Chemicals Manufacturing Residual Risk and Technology Review Proposed Rule*, available in the Cyanide Chemicals Manufacturing NESHAP docket (see EPA HQ-OAR-2020-0532).

F. What are the effective and compliance dates of the standards?

This section describes the effective dates and compliance dates for the final amendments to the Carbon Black Production and Cyanide Chemicals Manufacturing NESHAP. Section III.F.1 presents the effective dates and compliance dates for the Carbon Black Production NESHAP amendments. Section III.F.2 presents the effective dates and compliance dates for the Cyanide Chemicals Manufacturing NESHAP amendments.

1. Carbon Black Production

a. Effective Date of the Final Rule

The revisions to the Carbon Black Production MACT standards being promulgated in this action are effective on **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

b. Compliance Dates

For new sources (affected sources that commenced construction or reconstruction after January 14, 2021), the EPA is finalizing, as proposed, that affected sources must comply with all of the final rule requirements immediately upon the effective date of the rule, **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, or upon startup, whichever is later.

The EPA is finalizing, as proposed, that existing Carbon Black Production affected sources that commenced construction or reconstruction on or before January 14, 2021 (existing sources), must comply with the following requirements of the rule no later than **[INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]:** (1) Process vent emission standards applicability testing for carbon black production process vents; (2) the requirement to conduct performance tests no more than 60 months after the preceding test when demonstrating compliance with process vent emission control requirements; and (3) boiler and process heater annual tune-up requirements.

The EPA is finalizing a requirement that previously unregulated process vents from Carbon Black Production sources that commenced construction or reconstruction on or before January 14, 2021, will have until **[INSERT DATE THREE YEARS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** to comply with final rule requirements for process vents. This represents a change from the proposal. The EPA determined that changing the proposed compliance period is necessary, in the event that the applicability test indicates that previously unregulated process vents are required to route emissions to an existing control device or to a newly constructed control device. Based on comments received, the EPA believes providing a 3-year compliance period for newly subject process vents, instead of 1 year, is necessary and appropriate in order to ensure sufficient time for facilities to conduct the necessary

process design planning, purchases, construction, and changes to come into compliance and then perform the initial performance test.

For requirements related to SSM-related amendments and electronic reporting, the EPA is finalizing, as proposed, that all existing sources must be in compliance with the: (1) SSM-related amendments (changes proposed as a result of removing the SSM exemption from the requirements); (2) the alternative work practice standard specified in 40 CFR 63.1103(f)(5) related to the requirement that a closed vent system route the collected vapors to a control device when demonstrating compliance; and (3) the addition of requirements to submit reports electronically by **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Based on our assessment for existing sources, 180 days is the most expeditious compliance period practicable for complying with SSM-related and electronic reporting requirements.

The EPA considers 180 days to be sufficient for owners and operators of affected sources to comply with the alternative work practice standard for startup and shutdown.[6] Many of the work practice standard requirements included in the final rule are already implemented by industry.

Our experience with similar industries that are required to convert reporting mechanisms, to install necessary hardware and software, become familiar with the process of submitting performance test results electronically through the EPA's CEDRI, test these new electronic submission capabilities, and reliably employ electronic reporting, shows that a time period of a

[6] Section 63.983(a)(1) of 40 CFR part 63, subpart SS requires that each closed vent system be designed and operated to collect the regulated material vapors from the emission point, and to route the collected vapors to a control device, apply at all times.

minimum of 90 days, and, more typically, 180 days is generally necessary to successfully accomplish these revisions.

Our experience with similar industries further shows that owners and operators generally require a time period of 180 days to read and understand the amended rule requirements; to evaluate their operations to ensure that they can meet the standards during periods of startup and shutdown as defined in the rule and make any necessary adjustments; and to update their operation, maintenance, and monitoring plan to reflect the revised requirements.

2. Cyanide Chemicals Manufacturing

a. Effective Date of the Final Rule

The revisions to the Cyanide Chemicals Manufacturing standards being promulgated in this action are effective on **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

b. Compliance Dates

New sources (affected sources that commenced construction or reconstruction after January 15, 2021) must comply with all of the standards immediately upon the effective date of the standard, **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, or upon startup, whichever is later.

The compliance date for existing Cyanide Chemicals Manufacturing affected sources (affected sources that commenced construction or reconstruction on or before January 15, 2021) to comply with the final process wastewater standards is **[INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The EPA determined that affected sources are already complying with similar or substantially equivalent process wastewater requirements. The EPA is allowing 365 days to comply with the final process

wastewater requirements in order to provide owners and operators the time to evaluate process wastewater rule requirements and applicability to their operations, perform compliance calculations, and adjust plans and reports, as necessary.

For requirements related to SSM-related amendments (removing references to SSM-related exemptions in other subparts) and electronic reporting, the compliance date is **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].** Based on our assessment for existing sources, 180 days is the most expeditious compliance period practicable for complying with SSM-related and electronic reporting requirements.

For SSM-related amendments, our experience with similar industries indicates that regulated facilities generally require a time period of 180 days to read and understand the amended rule requirements; to evaluate their operations to ensure that they can meet the standards during periods of startup and shutdown as defined in the rule and make any necessary adjustments; and to update their operations to reflect the revised requirements.

For electronic reporting changes, our experience with similar industries that are required to convert reporting mechanisms, to install necessary hardware and software, become familiar with the process of submitting performance test results electronically through the EPA's CEDRI, test these new electronic submission capabilities, and reliably employ electronic reporting indicates that a time period of a minimum of 90 days, and, more typically, 180 days is generally necessary to successfully accomplish these revisions.

IV. What is the rationale for our final decisions and amendments for the Carbon Black Production source category?

For each issue, this section provides a description of what we proposed and what we are finalizing for the issue, the EPA's rationale for the final decisions and amendments, and a

summary of key comments and responses. For all comments not discussed in this preamble, comment summaries and the EPA's responses can be found in the comment summary and response document available in the docket for this source category.

A. Residual Risk Review for the Carbon Black Production Source Category

1. What did we propose pursuant to CAA section 112(f) for the Carbon Black Production source category?

On January 14, 2020 (86 FR 3056), the EPA proposed that risk posed by major sources in the Carbon Black Production source category is acceptable, that the current NESHAP provides an ample margin of safety to protect public health, and that additional standards are not necessary to prevent an adverse environmental effect. The estimated cancer risks were below the presumptive limit of acceptability and the noncancer risk results indicate there is minimal likelihood of adverse noncancer health effects due to HAP emissions from this source category. The proposed decision on ample margin of safety was based on weighing factors relevant to this particular source category, including the risk posed by point sources and the costs and cost-effectiveness of additional controls to reduce risk further, as well as uncertainties in the baseline emissions estimates used in estimating risk, the costs and effectiveness of the work practices we considered to reduce these emissions, and the amount of risk reduction that could be achieved with the work practices. The EPA sets standards under CAA section 112(f)(2) using "a two-step standard-setting approach, with an analytical first step to determine an 'acceptable risk' that considers all health information, including risk estimation uncertainty, and includes a presumptive limit on maximum individual risk (MIR) of approximately 1-in-10 thousand." (54 FR 38045, September 14, 1989). In the proposal, the EPA estimated risks based on actual and allowable emissions from carbon black production sources, and we considered these in

determining acceptability. A more thorough discussion of the risk assessment is included in the *Residual Risk Assessment for the Carbon Black Production Source Category in Support of the Risk and Technology Review 2021 Final Rule document*, available in the docket for this final rule (Docket-EPA-HQ-OAR-2020-0505).

In the proposed rule, as presented in Table 1 below, based on modeling actual emissions from the Carbon Black Production source category for all 15 facilities, we estimated inhalation cancer risk to the individual most exposed was less than 1-in-1 million. The estimated incidence of cancer due to inhalation exposures resulting from emissions from the source category was 0.00004 excess cancer cases per year, or one excess case every 25,000 years with no-one exposed to an excess cancer risk greater than or equal to 1-in-1 million due to inhalation exposure to HAP emissions from this source category. The Agency estimated that the maximum chronic noncancer target organ-specific hazard index (TOSHI) from inhalation exposure from this source category was 0.06. In the screening assessment of worst-case acute inhalation impacts, we estimated a maximum hazard quotient (HQ) of 0.09 (due to hydrogen cyanide) based on the reference exposure level (REL). As shown in Table 1, the chronic cancer and non-cancer risks are the same for allowable and facility-wide emissions as they are for actuals.

Table 1. Inhalation Risk Assessment Summary for Carbon Black Production[1] Source Category

Risk assessment	Number of facilities [2]	Maximum individual cancer risk (1-in-1 million)[3]	Estimated population at increased risk of cancer ≥1-in-1 million	Estimated population at increased risk of cancer ≥10-in-1 million	Estimated annual cancer incidence (cases per year)	Maximum chronic noncancer TOSHI[4]	Maximum screening acute noncancer HQ[5]

Baseline Actual Emissions							
Source Category	15	0.06	0	0	0.00004	<1 (neurological)	0.09 (REL)
Facility-wide	15	0.06	0	0	0.00004	<1 (neurological)	
Baseline Allowable Emissions							
Source Category	15	0.06	0	0	0.00004	<1 (neurological)	

[1] Based on actual and allowable emissions.
[2] Number of facilities evaluated in the risk assessment. Includes 15 operating facilities subject to 40 CFR part 63, subpart YY.
[3] Maximum individual excess lifetime cancer risk due to HAP emissions from the source category.
[4] Maximum TOSHI. The target organ with the highest TOSHI for the Carbon Black Production source category is the neurological system.
[5] The maximum estimated acute exposure concentration was divided by available short-term threshold values to develop an array of HQ values. The acute HQ shown was based upon the lowest acute 1-hour dose-response value, the REL for hydrogen cyanide. When an HQ exceeds 1, we also show the HQ using the next lowest available acute dose-response value.

We also conducted a multipathway screening assessment for the source category, and the results of the screening assessment are presented in the risk report titled *Residual Risk Assessment for the Carbon Black Production Source Category in Support of the 2021 Risk and Technology Review Final Rule,* and section IV of the proposal preamble (86 FR 3054), January 14, 2021) available in the docket for this action.

A screening value is not an estimate of the cancer risk or a noncancer HQ (or HI). Rather, a screening value represents a high-end estimate of what the risk or HQ may be. For the Carbon Black Production source category, the highest cancer screening value was from arsenic emissions, with a Tier 2 cancer screening value of 9, and the highest non-cancer screening value was from mercury emissions, with a Tier 3 non-cancer screening value of 2. We are confident that if a refined multipathway risk assessment was conducted, the HQ for mercury would be lower than 2. Further details on the Tier 3 screening assessment can be found in Appendix 11 of

the *Residual Risk Assessment for the Carbon Black Production Source Category in Support of the Risk and Technology Review 2021 Final Rule.* Arsenic emissions resulted in a Tier 2 cancer screening value of 9, which means that we are confident that the multipathway cancer risk is lower than 9-in-1 million. The EPA has determined that it is not necessary to go beyond the Tier 3 assessment for mercury (to a site-specific assessment) or beyond the Tier 2 cancer screening assessment. As explained above, the mercury screening value of 2 is a high-end estimate of what the risk or hazard may be and can be interpreted to mean that we are confident that the HQ would be lower than 2. Similarly, we are confident that the excess cancer risk is less than 9-in-1 million, and evaluation under Tier 3 or a site-specific assessment would further reduce the estimated risk. Further, risk results from five site-specific mercury assessments the EPA has conducted for five RTR source categories resulted in noncancer HQs that range from 50 times to 800 times lower than the respective Tier 2 mercury screening value for those facilities (refer to the identified Docket ID No. EPA-HQ-OAR-2017-0015 for a copy of these reports).[7] Based on our review of these analyses, we expect if we were to perform a site-specific assessment for the Carbon Black Production source category, the mercury HQ would be at least a one order of magnitude less than the modeled Tier 3 non-cancer screening value of 2 for mercury. Thus, the EPA is confident that the mercury HQ would be less than 1, if further refined to incorporate

[7] EPA Docket records: EPA-HQ-OAR-2017-0015, Appendix 11 of the *Residual Risk Assessment for the Taconite Manufacturing Source Category in Support of the Risk and Technology Review 2019 Proposed Rule*, Appendix 11 of the *Residual Risk Assessment for the Integrated Iron and Steel Source Category in Support of the Risk and Technology Review 2019 Proposed Rule*, Appendix 11 of the *Residual Risk Assessment for the Portland Cement Manufacturing Source Category in Support of the 2018 Risk and Technology Review Final Rule*, and Appendix 11 of the *Residual Risk Assessment for the Coal and Oil-Fired EGU Source Category in Support of the 2018 Risk and Technology Review Proposed Rule* and EPA Docket record: EPA-HQ-OAR-2019-0373, Appendix 11 of the *Residual Risk Assessment for the Iron and Steel Foundries Source Category in Support of the Risk and Technology Review 2019 Proposed Rule.*

enhanced site-specific analyses such as improved model boundary identification with improved soil/water run-off calculations and AERMOD deposition outputs used in the TRIM.FaTE model.

In evaluating the potential for multipathway effects from emissions of lead for the Carbon Black Production source category, the EPA compared modeled annual lead concentrations to the secondary National Ambient Air Quality Standards (NAAQS) level for lead (0.15 micrograms per cubic meter ($\mu g/m^3$), arithmetic mean concentration over a 3-month period). The highest annual average lead concentration, 0.000099 $\mu g/m^3$, is far below the NAAQS level for lead, indicating a low potential for multipathway impacts from lead.

In determining whether risk is acceptable for this source category, the EPA considered all available health information and risk estimation uncertainty that includes the uncertainty in the data (See proposal at 86 FR 3054, section III.C.7, *How do we consider uncertainties in risk assessment*?). The maximum cancer risk for all facilities was below 1-in-1 million; in addition, there were no facilities with an estimated maximum chronic noncancer HI or maximum HQ greater than or equal to 1. The EPA weighed all health risk factors in our risk acceptability determination, and we proposed that the risk from this source category is acceptable. We then considered whether the NESHAP provides an ample margin of safety to protect public health, and whether more stringent standards were necessary to prevent an adverse environmental effect, by taking into consideration costs, energy, safety, and other relevant factors. Based upon these considerations, we proposed and are finalizing the determination that the 2002 Carbon Black Production NESHAP requirements provide an ample margin of safety to protect public health. Based on the results of our environmental risk screening assessment, we also proposed and are finalizing the determination that more stringent standards are not necessary to prevent an adverse environmental effect.

2. How did the risk review change for the Carbon Black Production source category?

We did not receive any information that changed our determination concerning risk and we are finalizing our proposed conclusion on the risk review.

3. What key comments did we receive on the risk review, and what are our responses?

We received several comments regarding the proposed risk review and our proposed determination that no revisions to the standard were warranted under CAA section 112(f)(2). One commenter supported the proposed determination, while another, stated that EPA underestimated risks. After review of these comments, we disagreed with the commenter's assertion that risks were underestimated and determined no changes to the standard were necessary. The comments and our specific responses can be found in the document, *Summary of Comments and EPA's Responses on the National Emission Standards for Hazardous Air Pollutants Carbon Black Production Residual Risk and Technology Review and Carbon Black Production Area Sources Technology Review Proposed Rule,* which is available in docket: EPA-HQ-OAR-2020-0505.

4. What is the rationale for our final approach and final decisions for the risk review?

We evaluated all the comments on the EPA's risk review and determined that no changes are needed. For the reasons explained in the proposed rule, we determined that the risk from the Carbon Black Production source category is acceptable, the current standards provide an ample margin of safety to protect public health, and more stringent standards are not necessary to prevent an adverse environmental effect. Therefore, pursuant to CAA section 112(f)(2), we are finalizing our residual risk determination as proposed.

B. Technology Review for the Carbon Black Production Source Category

1. What did we propose pursuant to CAA section 112(d)(6) for the Carbon Black Production source category?

We proposed a determination that it is not necessary to revise the existing standards because we did not identify developments in practices, processes, or control technologies that would result in cost-effective emission reductions for the Carbon Black Production source category. However, we did identify a potential gap in the regulation, and proposed to broaden the scope of the standards under the CAA sections 112(d)(2) and (3). The final approach related to that issue is discussed in section IV.C of this preamble. Additional information on our technology review can be found in the memorandum, *Technology Review for Carbon Black Production Source Category*, which is available in docket: EPA-HQ-OAR-2020-0505.

We also performed a technology review of the Carbon Black Production area source NESHAP. As part of that review, the EPA did not identify any currently operating sources in the Carbon Black Production area source category, and therefore, we proposed no changes. In this action, we are finalizing our proposed determination. For more information on the review of potential area source facilities see the memorandum, *Identification of Area Sources for the Carbon Black Production NESHAP*, which is available in docket: EPA-HQ-OAR-2020-0505.

2. How did the technology review change for the Carbon Black Production source category?

The technology review did not change from proposal. Therefore, we are finalizing our determination that no revisions to the NESHAP are necessary pursuant to CAA section 112(d)(6) for both the major and area source categories.

3. What key comments did we receive on the technology review, and what are our responses?

We received two comments regarding the major source proposed technology review and our proposed determination that no revisions were warranted under CAA section 112(d)(6).

Comments suggested changes to our technology review to include additional technologies mentioned in consent decrees, including incinerators, wet or dry gas scrubbers, and selective catalytic reduction technologies. After review of these comments, we determined that no changes to the standards were necessary. Specifically, we determined that these technologies were not cost-effective for controlling HAP from carbon black facilities. The comments and our specific responses can be found in the document, *Summary of Comments and EPA's Responses on the National Emission Standards for Hazardous Air Pollutants Carbon Black Production Residual Risk and Technology Review and Carbon Black Production Area Sources Technology Review Proposed Rule*, which is available in docket: EPA-HQ-OAR-2020-0505. We did not receive any comments on the area source category proposed technology review.

4. What is the rationale for our final approach and final decisions for the technology review?

Our technology review sought to identify add-on control technology that was not identified during the original NESHAP development and improvements to existing add-on controls. We also sought to identify new work practices, operational procedures, process changes, pollution prevention alternatives, or techniques that have the potential to reduce emissions. Based on our review, we did not identify any technologies, that would result in cost-effective emission reductions for the Carbon Black Production source category. Since proposal, no information has been presented to cause us to change the proposed determination. Consequently, we are finalizing our CAA section 112(d)(6) determination as proposed.

C. What are the final rule amendments pursuant to 112(d)(2) and (3) for the Carbon Black Production source category?

1. What did we propose pursuant to CAA sections 112(d)(2) and (3) for the Carbon Black Production source category?

Under CAA sections 112(d)(2) and (3) we proposed to broaden the scope of the existing emission limit in the major source NESHAP, which applies to process vents associated with the MUF, to include all process vents associated with the carbon black production unit. The expansion to cover all process vents under the Carbon Black Production MACT standard is in accordance with *LEAN v. EPA*, 955 F. 3d. 1088 (D.C. Cir. 2020), in which the Court held that the EPA has an obligation to set standards for unregulated pollutants which the EPA is required to regulate as part of technology reviews under CAA section 112(d)(6).

We proposed to require all process vents that have a HAP concentration of the emission stream equal to or greater than 260 ppmv, including those located after the MUF, to reduce emissions of total HAP by 98 weight-percent or to a concentration of 20 ppmv, whichever is less stringent. We also proposed to require applicability testing of process vents located after the MUF and compliance with process vent standards (where applicability threshold was exceeded) within 1 year after the effective date of the final rule.

2. What changed since proposal?

We are finalizing a longer timeframe for previously unregulated process vents to come into compliance with the requirements, since this may require the addition of add-on controls. The extension changes the proposed compliance date of 1 year from the effective date of the final rule to 3 years from the effective date of the final rule.

3. What are the key comments and responses?

The EPA received comments generally supporting the proposal to broaden the emission limit to apply to all process vents that have a HAP concentration of the emission stream equal to or greater than 260 ppmv, associated with the carbon black production unit. One commenter requested an extension to the compliance date.

a. Compliance date extension

Comment: The commenter stated that they do not believe carbon black facilities will be able to implement the carbon black process vent requirements for any previously unregulated process vents within 1 year of the effective date. In support of their comment, the commenter stated that the EPA has addressed similar situations in final rules by allowing up to 3 years from the effective date of the final rule for facilities to complete any necessary capital projects as allowed for by CAA section 112(i). For a detailed summary of the comment, see the document *Summary of Comments and EPA's Responses on the National Emission Standards for Hazardous Air Pollutants Carbon Black Production Residual Risk and Technology Review and Carbon Black Production Area Sources Technology Review Proposed Rule*, available in the docket for this source category.

Response: The EPA agrees with the commentor that, in the event that the applicability test indicates that any newly identified process vents are subject and require re-routing to an existing control device or the construction of a new control device, the 1-year time period that the EPA proposed to allow for carbon black facilities to bring the process vents into compliance may be insufficient. As noted by the commenter, while the 1-year time frame is sufficient for conducting the applicability test, it may not provide enough time to complete the process of safely designing and constructing the ductwork necessary to either re-route the vent to an existing control device or design and construct ductwork for re-routing the vent and a new control device. To address this concern, the EPA is extending this time period in the final rule and allowing up to 3 years from the effective date of the final rule for facilities to complete any necessary capital projects as allowed for by CAA section 112(i). The language at 40 CFR 63.1102(e) has been amended in the final rule to reflect this change.

D. Amendments Addressing Emissions During Periods of SSM for the Carbon Black Production Source Category

1. What amendments did we propose to address emissions during periods of SSM?

The EPA proposed to remove the exemption for periods of startup and shutdown. Additionally, we proposed a work practice standard during periods of startup that would have allowed carbon black manufacturing facilities to vent tail gas upon startup for a period not to exceed 13 minutes, and to begin running control devices thereafter. The proposed work practice standard sought to address safety concerns surrounding startup processes at carbon black manufacturing facilities. The EPA proposed the work practice standard to mitigate the risk of explosion at carbon black manufacturing facilities upon startup due to the characteristics of the tail gas. The proposed work practice standard addressed combustibility concerns by allowing tail gas to be vented through the MUF vent for a short, time-limited period in order to prevent excess oxygen from mixing with tail gas. The EPA time-limited the proposed work practice standard to ensure sources would begin routing tail gas to control devices as soon as practicable, while accounting for variability across facilities that impact startup procedures.

2. How did the proposed amendments to address emissions during periods of SSM requirements change in the final rule?

The EPA initially proposed that the work practice standard would apply for 13 minutes upon startup. Due to comments received on the proposal, the EPA is finalizing a work practice standard that applies to both startup and shutdown of the reactor. The work practice standard allows the closed vent system to the control device to be bypassed, during both startup and shutdown of a reactor, when the excess oxygen concentration in the closed vent system is greater than or equal to 3 percent. Additionally, the maximum bypass period for the work practice

standard is extended from 13 minutes to 15 minutes. To determine when the oxygen concentration of the closed vent system falls below 3 percent, each facility must use the calculated purge duration method or oxygen sensors. The language at 40 CFR 63.1003(f)(5) has been amended in the final rule to reflect these changes.

3. What key comments did we receive on the SSM revisions and what are our responses?

The EPA received comments on several aspects of the proposed work practice standard. Comments received include requests for (1) site-specific procedures, (2) expansion of the standard to shutdown periods (in addition to startup periods), (3) an increase in the time period allowed under the work practice standard, and (4) specific regulatory language changes. We are only revising requirements where credible technical and/or safety issues were identified, while maintaining the goal of minimizing emissions during periods of startup and shutdown to the maximum extent practicable. These comments and the EPA's response to these comments are provided below.

a. Site-Specific Startup and Shutdown Procedures

Comment: The commenter stated that factors affecting the time needed for startup and shutdown procedures are specific to each facility because the time needed to purge the closed vent system and/or open and close valves depends on the configuration of the facility, common tail gas header, and the production line; the volume of the production line; the size of the valves; the production rate; and the facility-specific operating procedures and provides an example. To allow for this source-specific variability, the commenter suggested that instead of relying solely on oxygen concentration, the regulation should allow bypass of the control device during startup and shutdown of a reactor in accordance with the maximum duration calculated using the calculated purge duration method located in the startup and shutdown plan (SSP) and that the

startup and shutdown occur "as expeditiously as possible." The commenter stated that the use of oxygen sensors in the MUF is not current industry practices, and that of the current 15 major source facilities, only two of them have oxygen sensors. The commenter also stated that the calculated purge duration method in the SSP would include a calculation of the amount of time it takes to purge the production line, as well as a safety factor that accounts for the physical and technological constraints of the facility; the maximum duration could not be more than 15 minutes. The commenter stated that the SSP would provide the amount of time needed when completing startup and shutdown "as expeditiously as possible." For a more detailed summary of the comment, see the document *Summary of Comments and EPA's Responses on the National Emission Standards for Hazardous Air Pollutants Carbon Black Production Residual Risk and Technology Review and Carbon Black Production Area Sources Technology Review Proposed Rule,* which is available in docket: EPA-HQ-OAR-2020-0505.

Response: The EPA agrees that the bypass time allowed for a reactor to startup or shutdown should be source specific. The EPA acknowledges that most facilities currently do not operate oxygen sensors and relying solely on oxygen sensors to detect oxygen content in the ductwork upon startup and shutdown could lead to undetected pockets of high-oxygen concentration gases escaping the sensors, creating an explosion risk within the ductwork at a facility.

Additionally, the EPA agrees that during startup the MUF vent must be open and the common tail gas header closed when initially burning feedstock oil to purge the line of excess oxygen. If the common tail gas header is opened while the oxygen level was above 3 percent, there is a risk of explosion due to the combustible nature of the tail gas. Once the oxygen level falls below 3 percent (determined by using the calculated purge duration method discussed

below), the MUF vent must gradually close while the common tail gas header is gradually opened. This gradual change helps to ensure that constant pressure is maintained within the closed vent system and common tail gas header. The EPA acknowledges that maintaining constant pressure is important. A sudden surge or interruption in tail gas flow could extinguish the flame on the control device located downstream of the common tail gas header. If the flame is extinguished, there is a risk that combustible gases will build up in the common tail gas header; if combustible gases build up in the common tail gas header, then these gases could cause an explosion when the flame is relit.

The EPA found that all facilities currently use the calculated purge duration method to predict when the oxygen level in the ductwork drops below 3 percent. The calculated purge duration method estimates the total time a facility needs to safely startup or shutdown a carbon black production line by taking into account several factors, including the volume of tail gas in the closed vent system, the flowrate within the closed vent system, a safety factor, and the time needed to balance pressure by opening and closing the necessary valves. Using the calculated purge duration method is industry practice for facilities to determine when oxygen levels are below 3 percent.

Since all facilities currently utilize the calculated purge duration method, the EPA finds this practice to be representative of the best performing facilities within the industry. The EPA is declining to require SSPs in the final rule; instead, the EPA is finalizing a change from proposal at 40 CFR 63.1103(f) to require facilities to utilize the calculated purge duration method to determine a site-specific maximum bypass duration upon startup and shutdown. The EPA determined that including site-specific requirements at 40 CFR 63.1103(f) would accomplish the same goal as SSPs without adding additional reporting burden.

b. Work Practice Standard Should Apply During Startup and Shutdown

Comment: The commenter requested that the proposed work practice standard be revised to apply during shutdown as well as during startup. In support of their comment, the commenter provided a comprehensive discussion of the carbon black production startup and shutdown processes and the reasoning for their request for modifications to the proposed work practice standard requirements. Reasons for expanding the work practice to shutdown as well as startup include the similarities in the need to maintain constant pressure and to reduce the oxygen content in the closed vent system to under 3 percent due to the risk of explosion for both startup and shutdown. For a summary of their detailed comments regarding startup and shutdown, see the document *Summary of Comments and EPA's Responses on the National Emission Standards for Hazardous Air Pollutants Carbon Black Production Residual Risk and Technology Review and Carbon Black Production Area Sources Technology Review Proposed Rule,* available in the docket for this rulemaking.

Response: Based on the information provided by the commenter, EPA agrees that shutdown operations present safety concerns similar to those associated with startup. Accordingly, the EPA is finalizing a revision to the proposed work practice standard so that it applies to both startup and shutdown operations.

The EPA agrees that the shutdown process presents combustibility concerns similar to startup. When facilities stop burning feedstock oil, higher oxygen content is created in the closed vent system. This creates an explosion risk if the oxygen level rises above 3 percent. Therefore, prior to removing feedstock oil from the reactor, the common tail gas header vent must be closed completely, diverting closed vent system emissions from the common tail gas header to the MUF, before the oxygen content begins to increase.

Similar to startup, constant pressure must be maintained within the closed vent system during shutdown operations to reduce the risk of explosion. To achieve constant pressure within the closed vent system, the MUF vent must be slowly opened while the tail gas header vent is slowly closed. Once the tail gas header has been completely closed and the MUF vent is completely open, the burning of feedstock oil in the reactor ceases. The EPA acknowledges that maintaining constant pressure is important. A sudden surge or interruption in tail gas flow could extinguish the flame on the CCD or other combustion device located downstream of the common tail gas header. If the flame is extinguished, there is a risk that combustible gases will build up in the common tail gas header; if combustible gases build up in the common tail gas header, then these gases create an explosion risk when the flame is relit.

c. Work Practice Standard Time Allotment

Comment: The commenter requested that the maximum time allowed to bypass the control device during startup and shutdown of a reactor be increased from 13 minutes to 15 minutes. The commenter explained that their request for this increase in time is based on the minimum time necessary to completely purge the ductwork and MUF of certain facilities. The commenter provided that this was previously agreed to by the EPA in the consent decrees below.

In 2007, the EPA began a National Enforcement Initiative to investigate the carbon black manufacturing sector. As a result of this initiative, each of the International Carbon Black Association (ICBA) member companies in the United States entered into a settlement with the EPA and the Department of Justice regarding CAA claims (hereinafter, the "Consent Decrees"). The implementation of the terms of these Consent Decrees has and will result in substantial changes to the facilities as flares are removed and different control technologies are installed at a

significant cost. Many facilities have already implemented the agreed upon technologies and others are in the procurement stages.

The commenter stated that, in the preamble, the EPA explains that "the 13-minute allotment to bypass the control device, corresponds with the minimum time necessary to completely purge the ductwork and primary bag filter of the facility representing the lowest production rate." However, the commenter suggested that when setting the 13-minute limit, it appears that the EPA did not fully consider the agreed-upon time limit in all of the consent decrees or all of the factors which affect how long it takes a facility to purge excess oxygen and introduce tail gas to the common tail gas header while balancing pressure. The commenter stated that the consent decree for Sid Richardson Carbon, Ltd. allowed a 15-minute bypass.[8,9]

Response: The EPA acknowledges that the consent decree cited by the commenter allows a 15-minute control device bypass upon startup for the facility subject to the consent decree allotment to bypass the control device. In their comment, the commenter provided information to the EPA concerning the source-specific nature of startup and shutdown operations at carbon black manufacturing facilities, including technical support demonstrating that one source subject to this rulemaking may need up to 15 minutes to purge the excess oxygen content in the MUF vent during startup and shutdown operations in order to mitigate combustibility concerns. To address this comment, in the final rule, the EPA is extending the proposed 13-minute bypass period to a maximum 15-minute bypass period. However, this time period is further constrained by the calculated purge duration method. The EPA is also finalizing a requirement that facilities

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[8] *United States v. Sid Richardson Carbon, Ltd.*, 3:17-cv-01792-SDD-RLB (M.D. La.), Consent Decree, filed Dec. 22, 2017, at § III.8.oo.
[9] *United States v. Sid Richardson Carbon, Ltd.*, 3:17-cv-01792-SDD-RLB (M.D. La.), Consent Decree, filed Dec. 22, 2017, at § III.8.oo.

subject to this rule use the calculated purge duration method to determine the length of the startup and/or shutdown bypass period required for a specific facility before that specific facility may begin to safely operate control devices, and the facility must begin operating control devices as soon as the facility may safely do so. In no case do the finalized requirements allow the startup or shutdown bypass period to exceed 15 minutes for any facility. The EPA is also amending the work practice standard to apply to periods of shutdown as well as startup.

As previously mentioned, carbon black production facilities currently use the calculated purge duration method to predict when the oxygen level in the closed vent system drops below 3 percent. The calculated purge duration method considers the volume of tail gas in the closed vent system, with an appropriate safety factor, and the time needed to balance pressure and close or open the necessary valves. Using the calculated purge duration method is common industry practice for facilities to determine when oxygen levels are below 3 percent.

Since all facilities currently utilize the calculated purge duration method, the EPA finds this practice to be representative of the best performing facilities within the industry. As previously discussed, the EPA is declining to require SSPs. Instead, the EPA is modifying the proposed standard at 40 CFR 63.1103(f)(5) to require facilities to utilize the calculated purge duration method or oxygen sensors to determine a site-specific maximum bypass duration upon startup and shutdown. In no case shall the maximum bypass duration period exceed 15 minutes for any facility. The calculated purge duration method is the same approach underlying the control device bypass timeframes included in the enforcement-related consent decrees for the carbon black industry.

4. What is the rationale for our changes to the proposed amendments to address emissions during periods of SSM in the final rule?

Based on the consideration of comments received concerning technical and safety concerns with the proposed work practice standard, the EPA revised the work practice standard provisions in the final rule. As discussed in our responses to comments in section IV.C.3 of this preamble, we are only revising requirements where credible technical and/or safety issues were identified, while maintaining the goal of minimizing emissions during periods of startup and shutdown to the maximum extent practicable.

E. Other Technical Amendments to the Carbon Black Production NESHAP

1. Boiler and Process Heater Annual Tune-Up Requirements

a. What amendments did we propose for boiler and process heater annual tune-up requirements?

As a result of the EPA's assessment of the MACT standards that currently apply to the Carbon Black Production source category under subpart YY, the EPA received a comment that there may be instances where carbon black production process vents at affected sources route emissions to a boiler or process heater for use as fuel gas and may not be subject to any requirements. Under the existing standards, although emission streams may be subject to the Carbon Black Production MACT, these streams are exempt from any requirements under the rule when emissions are routed to a boiler or process heater for use as fuel gas. Under the Boiler MACT, process heaters and boilers covered under another standard (as with the Carbon Black Production MACT) are not subject to the Boiler MACT.

The EPA proposed to revise subpart YY to include boiler and process heater annual tune-up requirements for those boilers and process heaters that receive tail gas for use as fuel gas. These provisions were proposed in 40 CFR 63.1103(f)(3)(iii) of the final rule. The annual tune-up provisions paralleled those specified under the Boiler MACT.

b. How did the proposed boiler and process heater tune-up requirements change in the final rule?

The final rule revises the definition for "process vent" to remove the fuel gas exemption for the Carbon Black Production source category. This revised change ensures that the annual tune-up requirements apply to process heaters and boilers, as intended.

The final rule also revises the text at 40 CFR 63.1103(f)(3)(iii)(A) (first sentence) to require inspection to be of the "combustion device" instead of the "burner," and at 40 CFR 63.1103(f)(iii)(B), (C), (D) and (E) to provide industry-specific clarification on tune-up requirements.

c. What key comments did we receive on the proposed annual boiler and process heater tune-up requirements and what are our responses?

The EPA received comments on the proposed boiler and process heater tune-up requirements related to the applicability language and specified tune-up procedures. These comments and the EPA's responses and subsequent changes to the proposed boiler and process heater tune-up provisions are provided below.

i. Applicability

Comment: The commenter suggested that the proposed language for the annual tune-up requirement be changed so that it applies to the process heaters and boilers that the EPA intended. The commenter noted that the EPA explained that it added the annual tune-up requirement to close a perceived loophole. The commenter stated that they are unsure whether the proposed modifications in the proposal achieved the EPA's goal. The commenter noted that while the preamble to the proposed rule identifies the target of the annual tune-up requirements to be boilers and process heaters receiving emissions to use as fuel gas, the language in the proposed rule may not apply to the intended boilers or process heaters.

The commenter explained that, in the current regulations, emission streams that are routed to a boiler or process heater for fuel gas are not regulated as a process vent, because "[g]as streams transferred for fuel value (*i.e.*, net positive heating value), use reuse, or sale for fuel value, use, or reuse," are excluded from the definition of process vent. 40 CFR 63.1101. Therefore, the commenter noted that when emissions are routed to a boiler or process heater for use as fuel gas at a carbon black production facility, those points of discharge are not process vents. The proposed rule does not alter the definition of process vent, and the commenter was uncertain what effect the changes to Table 8 of the proposed regulatory text would have on the current standards. The commenter stated that changes in Table 8 of the proposed regulatory text apply only to "process vents" and under the definition of process vents, this would necessarily mean that it could not include gas streams routed to boilers or process heaters for fuel value. For a more detailed summary of the comment, see *Summary of Comments and EPA's Responses on the National Emission Standards for Hazardous Air Pollutants Carbon Black Production Residual Risk and Technology Review and Carbon Black Production Area Sources Technology Review Proposed Rule*, which is available in docket: EPA-HQ-OAR-2020-0505.

Response: The EPA acknowledges that the proposed regulatory text was unclear and could lead to subject facilities not complying with the added boiler and process heater requirements. To resolve this issue, the EPA is revising the definition for process vent to remove the fuel gas exemption for the Carbon Black Production source category. Specifically, the EPA is finalizing an amended definition of "process vent" to remove the exemption for gas streams transferred for fuel value, use, reuse, or sale for fuel value, use, or reuse for the carbon black production source category.

ii. Annual Tune-Up Requirements

Comment: Commenters also requested tailored modifications to the tune-up requirements to better reflect the specifications of combustion devices typically used in the carbon black production process. The commenter noted that carbon black combustion devices differ significantly from natural gas combustion devices such that not all of the proposed tune-up requirements apply In support of their comment, the commenter states that additional optimization outside of inspection and cleaning may not be possible for all facilities. For a more detailed summary of the comment, see *Summary of Comments and EPA's Responses on the National Emission Standards for Hazardous Air Pollutants Carbon Black Production Residual Risk and Technology Review and Carbon Black Production Area Sources Technology Review Proposed Rule*, which is available in docket: EPA-HQ-OAR-2020-0505.

Response: The EPA agrees with the commenter that, as a result of the nature of the burner configuration and design of tail gas fired boilers and process heaters in the Carbon Black Production source category, the tune-up requirements of the proposed rule may not be able to be performed as written. As the commenter noted, due to the lack of an inspection port for the "typical" burner configuration used in the carbon black production process, it may not be possible to perform a direct inspection of the burner in operation, as described in 40 CFR 63.1103(f)(3)(iii)(A). Thus, the EPA is finalizing the suggested revision to the regulatory text at 40 CFR 63.1103(f)(3)(iii)(A) to read "[i]nspect the combustion device for damage, wear, and buildup of material that could impact effectiveness" rather than "inspect the burner." The EPA disagrees in part with the other changes suggested by the commenter. As noted by the commenter, a "typical" burner configuration may not be amenable to inspection of the flame pattern and adjustment of the burner, but it is possible in some configurations. The regulatory text at 40 CFR 63.1103(f)(iii)(B) has been amended to require the inspection and adjustment

only when possible based upon the physical configuration of the burner. Similarly, the requirements of 40 CFR 63.1103(f)(iii)(C) state to "[i]nspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly." The EPA agrees that not all configurations of systems controlling air-to-fuel ratio have calibrated components, but some systems may have components that are calibrated and would need that calibration verified. However, if a burner system does not have anything to be calibrated, then ensuring proper calibration is not necessary; the inspection of the fuel to air ratio controlling mechanism in that case could be as simple as verifying that there are no obstructions to the air intake in a natural draft system and verifying proper fan operation for a fixed air flow fan. For these reasons, the EPA also agrees that 40 CFR 63.1103(f)(iii)(C) should not be finalized as proposed and is amending the final language to reflect that ensuring proper calibration is only necessary for calibrated components of the air-to-fuel system.

The EPA disagrees with the commenter that 40 CFR 63.1103(f)(iii)(D) and (E) should not be finalized and disagrees that measurement of carbon monoxide (CO) is a poor indicator of optimized performance. As CO is a primary component of tail gas, any tail gas not combusted by the boiler or process heater will result in CO emissions. Additionally, CO is produced from the incomplete combustion of hydrocarbons in the tail gas. During proper operation of the combustion device, the output of CO from either uncombusted tail gas or from incomplete combustion is minimized. The EPA agrees that optimization beyond the inspection and cleaning required in 40 CFR 63.1103(f)(iii)(A) may not be possible for the configuration of some carbon black facility combustion devices. In such a scenario, the proposed language of 40 CFR 63.1103(f)(iii)(D) was clear that "[t]his optimization should be consistent with the manufacturer's specifications, if available." In instances where there are no manufacturer's

recommendations for optimization, the cleaning of the combustion device constitutes the optimization procedure, and CO measurement should be taken before and after cleaning the combustion device. The regulatory text at 40 CFR 63.1103(f)(iii)(D) has been amended from that proposed to more clearly reflect that, in the cases where no manufacturer's specification for optimization are available, the inspection and cleaning procedures of 40 CFR 63.1103(f)(iii)(A) fulfill the requirements of optimization and that when available, manufacturer's specification should be used for the optimization procedure. The regulatory text at 40 CFR 63.1103(f)(iii) (E) has been amended from that proposed to reflect that if adjustments are not or cannot be made, the measurements of CO are performed after the inspection and cleaning procedures of 40 CFR 63.1103(f)(iii)(A) are performed.

d. What is the rationale for our final changes to the proposed boiler and process heater annual tune-up provisions?

Based on the consideration of comments received on the combustion devices typically used in the carbon black production process, we clarified and revised the applicability and requirements of the annual boiler and process heater tune-up requirements to better reflect the combustion devices typically used. See our comment response directly above in subsection ii, for our rationale for revisions based on our evaluation of comments.

V. What is the rationale for our final decisions and amendments for the Cyanide Chemicals Manufacturing source category?

For each issue, this section provides a description of what we proposed and what we are finalizing for the issue, the EPA's rationale for the final decisions and amendments, and a summary of key comments and responses (when applicable). For all comments not discussed in

this preamble, comment summaries and the EPA's responses can be found in the comment summary and response document available in the docket for this source category.

A. Residual Risk Review for the Cyanide Chemicals Manufacturing Source Category

1. What did we propose pursuant to CAA section 112(f) for the Cyanide Chemicals Manufacturing source category?

On January 15, 2021 (86 FR 3906), the EPA proposed that risk posed by emissions from the source category is acceptable, that the current NESHAP provides an ample margin of safety to protect public health, and that additional standards are not necessary to prevent an adverse environmental effect. The EPA sets standards under CAA section 112(f)(2) using "a two-step standard-setting approach, with an analytical first step to determine an 'acceptable risk' that considers all health information, including risk estimation uncertainty, and includes a presumptive limit on MIR of approximately 1-in-10 thousand." (54 FR 38045, September 14, 1989). The maximum estimated cancer risk was below the presumptive limit of acceptability and the noncancer risk results indicate there is minimal likelihood of adverse noncancer health effects due to HAP emissions from this source category. The proposed decision on ample margin of safety was based on weighing factors relevant to this particular source category, including the risk posed by emissions from the category and the costs and cost-effectiveness of additional controls to reduce risk further, as well as uncertainties in the baseline emissions estimates used in estimating risk, the costs and effectiveness of the work practices we considered to reduce these emissions, and the amount of risk reduction that could be achieved with the work practices. A more thorough discussion of the risk assessment is included in the *Residual Risk Assessment for the Cyanide Chemicals Manufacturing Source Category in Support of the Risk and Technology Review 2021 Final Rule* document, available in the docket for cyanide chemicals manufacturing

(Docket-EPA-HQ-OAR-2020-0532). In the proposed rule, as presented in Table 2 below, based on modeling actual emissions from the source category for all 13 facilities, we estimated inhalation cancer risk to the individual most exposed was equal to 5-in-1 million. The estimated incidence of cancer due to inhalation exposures resulting from emissions from the source category was 0.004 excess cancer cases per year, or one excess case every 250 years with 61,653 people exposed to an excess cancer risk greater than or equal to 1-in-1 million due to inhalation exposure to HAP emissions from the source category. Emissions of acrylonitrile from process vents account for 95 percent of the cancer incidence. The Agency estimated that the maximum chronic noncancer TOSHI from inhalation exposure for this source category was equal to 1. In the screening assessment of worst-case acute inhalation impacts, we estimated a maximum HQ of 1 (due to hydrogen cyanide) based on the REL. In the proposal, the EPA estimated risks based on actual and allowable emissions from cyanide chemicals manufacturing sources, and we considered these in determining acceptability. As shown in Table 2, the chronic cancer and non-cancer risks are the same for allowable emissions as they are for actual emissions.

Table 2. Inhalation Risk Assessment Summary for Cyanide Chemicals Manufacturing[1] Source Category

Risk assessment	Number of facilities[2]	Maximum individual cancer risk (1-in-1 million)[3]	Estimated population at increased risk of cancer ≥1-in-1 million	Estimated population at increased risk of cancer ≥10-in-1 million	Estimated annual cancer incidence (cases per year)	Maximum chronic noncancer TOSHI[4]	Maximum screening acute noncancer HQ[5]
Baseline Actual Emissions							
Source Category	13	5	61,653	0	0.004	1 (neurological)	1 (REL)
Facility-wide	13	200	266,532	58,000	0.04	1 (neurological)	

Baseline Allowable Emissions							
Source Category	13	5	61,653	0	0.004	1 (neurological)	

[1] Based on actual and allowable emissions.
[2] Number of facilities evaluated in the risk assessment. Includes 13 operating cyanide chemicals manufacturing facilities subject to 40 CFR part 63, subpart YY.
[3] Maximum individual excess lifetime cancer risk due to HAP emissions.
[4] Maximum TOSHI. The target organ with the highest TOSHI for the Cyanide Chemical Manufacturing source category is the neurological system.
[5] The maximum estimated acute exposure concentration was divided by available short-term threshold values to develop an array of HQ values. The acute HQ shown was based upon the lowest acute 1-hour dose-response value, the REL for hydrogen cyanide. When an HQ exceeds 1, we also show the HQ using the next lowest available acute dose-response value.

The EPA also estimated inhalation risk based on facility-wide emissions. The estimated maximum individual excess lifetime cancer risk based on facility-wide emissions was 200-in-1 million, with 0.04 excess cancer cases per year, or one case every 25 years. This cancer risk is driven by emissions sources that are not in the Cyanide Chemicals Manufacturing source category; specifically, emissions of ethylene oxide and polycyclic organic matter from non-category sources account for 95 percent of the cancer incidence. Approximately 150 people are exposed to an excess cancer risk greater than or equal to 100-in-1 million, with 266,532 people exposed to an excess cancer risk above 1-in-1 million. The estimated maximum chronic noncancer TOSHI values for the facility-wide assessment was the same as estimated based on actual and allowable emissions from the source category. The TOSHI value was equal to 1 for neurological effects driven by hydrogen cyanide emissions from process vents, wastewater, and equipment leaks.

Regarding the facility-wide risks due to ethylene oxide emissions, which are emitted by sources that are not part of the Cyanide Chemicals Manufacturing source category, we intend to continue to evaluate those facility-wide estimated emissions and risks further and may address these in separate actions, as appropriate. In particular, the EPA is addressing ethylene oxide in

response to the results of the latest National Air Toxics Assessment (NATA) released in August 2018, which identified the chemical as a potential concern in several areas across the country.[10] The latest NATA estimates that ethylene oxide significantly contributes to potential elevated cancer risks in some census tracts across the U.S. (less than 1 percent of the total number of tracts). These elevated risks are largely driven by an EPA risk value that was updated in late 2016. The EPA is taking steps to address ethylene oxide emissions by: (1) reviewing and, as appropriate, revising CAA regulations for facilities that emit ethylene oxide—starting with air toxics emissions standards for miscellaneous organic chemical manufacturing facilities (85 FR 49084, August 12, 2020) and commercial sterilizers; and (2) working with industry and state, local, and tribal air agencies to achieve near-term emission reductions. The EPA posts updates on its work to address ethylene oxide at: *https://www.epa.gov/ ethylene-oxide.*

We also conducted a multipathway screening assessment for the source category, and the results of the screening assessment are presented in the risk report titled *Residual Risk Assessment for the Cyanide Chemicals Manufacturing Source Category in Support of the 2021 Risk and Technology Review Final Rule,* and section IV of the proposal preamble (86 FR 3906, January 15, 2021) available in the docket for this action. A screening value is not an estimate of the cancer risk or a noncancer HQ (or HI). Rather, a screening value represents a high-end estimate of what the risk or HQ may be. For this source category the highest cancer screening value was a Tier 2 cancer screening value less than 1 for arsenic emissions, which means that we are confident that the multipathway cancer risk is lower than 1-in-1 million. The highest Tier 2

[10] NATA is the Agency's nationwide air toxics screening tool, designed to help the EPA and state, local, and tribal air agencies identify areas, pollutants, or types of sources for further examination.

non-cancer screening value for the category was less than 1 for mercury emissions, which can be interpreted to mean that we are confident that the chronic HQ for mercury is less than 1.

In evaluating the potential for multipathway effects from emissions of lead, the EPA compared modeled annual lead concentrations to the secondary NAAQS level for lead (0.15 micrograms per cubic meter (ug/m^3), arithmetic mean concentration over a 3-month period). The highest annual average lead concentration, 0.000004 ug/m^3, is far below the NAAQS level for lead, indicating a low potential for multipathway impacts from lead.

Based on the results of the environmental risk screening analysis, we do not expect an adverse environmental effect as a result of HAP emissions from this source category. For further additional detail on the environmental risk screening assessment, refer to the *Residual Risk Assessment for the Cyanide Chemicals Manufacturing Source Category in Support of the Risk and Technology Review 2021 Final Rule.*

In determining whether risk is acceptable for this source category, the EPA considered all available health information and risk estimation uncertainty, including the uncertainty in the emissions data. Further discussion of the uncertainties in our risk assessment can be found in section III.C.7 of the preamble to the proposed rule at 86 FR 3918. Under the ample margin of safety analysis, we evaluated the cost and feasibility of available control technologies and other measures (including the controls, measures, and costs reviewed under the technology review) that could be applied to this source category to further reduce the risks (or potential risks) due to emissions of HAP from the source category. At proposal, we determined that the risk from Cyanide Chemicals Manufacturing emissions is acceptable and that the standards provide an ample margin of safety to protect public health and prevent an adverse environmental effect. In this action, we are finalizing our proposed determination. See section IV.C of the proposal

preamble (86 FR 3906, 3923-3924) for a discussion of the results of our risk assessment and analyses and our proposed decisions regarding risk acceptability, ample margin of safety, and adverse environmental effects. The EPA is not amending the Cyanide Chemicals Manufacturing NESHAP based on the risk review conducted pursuant to CAA section 112(f). The maximum cancer risk for all facilities was 5-in-1 million, which is 20 times below 100-in-1 million, the presumptive upper limit of acceptable risk. In addition, there were no facilities with an estimated maximum chronic noncancer HI or maximum HQ greater than 1. Based upon these considerations and the lack of additional cost-effective control technologies to reduce risk further, we proposed and are finalizing a determination that the 2002 Cyanide Chemicals Manufacturing NESHAP requirements provide an ample margin of safety to protect public health. Based on the results of our environmental risk screening assessment, we also proposed and are finalizing a determination that more stringent standards are not necessary to prevent an adverse environmental effect.

2. How did the risk review change for the Cyanide Chemicals Manufacturing source category?

We did not receive any information that changed our determination concerning risk and we are finalizing our proposed conclusion on the risk review.

3. What key comments did we receive on the risk review, and what are our responses?

We received several comments regarding the proposed risk review and our proposed determination that no revisions to the standard were warranted under CAA section 112(f)(2). Comments both supported and suggested changes to our risk review. Commenters opposed our proposed decisions regarding risk acceptability and certain aspects of our risk assessment methodology. After review of these comments, we determined that no changes to the standard were necessary because the current standards provide an ample margin of safety to protect public

health. The comments and our specific responses can be found in the document, *Summary of Comments and EPA's Responses on the National Emission Standards for Hazardous Air Pollutants: Cyanide Chemicals Manufacturing Residual Risk and Technology Review Proposed Rule,* which is available in docket: EPA-HQ-OAR-2020-0532.

4. What is the rationale for our final approach and final decisions for the risk review?

We evaluated all the comments on the EPA's risk review and determined that no changes are needed. For the reasons explained in the proposed rule, we determined that the risk from the Cyanide Chemicals Manufacturing source category is acceptable, the current standards provide an ample margin of safety to protect public health, and more stringent standards are not necessary to prevent an adverse environmental effect. Therefore, pursuant to CAA section 112(f)(2), we are finalizing our residual risk determination as proposed.

B. Technology Review for the Cyanide Chemicals Manufacturing Source Category

1. What did we propose pursuant to CAA section 112(d)(6) for the Cyanide Chemicals Manufacturing source category?

At proposal, we proposed to determine that it is not necessary to revise the existing standards pursuant to CAA section 112(d)(6) because we did not identify developments in practices, processes, or control technologies that would result in cost-effective emission reductions for the Cyanide Chemicals Manufacturing source category. Additional information on our technology review can be found in the memorandum, *Technical Support Document for the Cyanide Chemicals Manufacturing NESHAP Residual Risk and Technology Review Proposal*, which is available in the docket for this action (see Docket ID No. EPA-HQ-OAR-2020-0532-0025) and section IV.D of the proposal preamble (86 FR 3924). The EPA is not amending the Cyanide Chemicals Manufacturing NESHAP based on our technology review. However, we did

identify a potential gap in the regulation, and proposed standards for process wastewater at existing sources and upstream suppression of process wastewater at new sources under CAA sections 112(d)(2) and (3). The final approach related to that issue is discussed in section V.C of this preamble.

2. How did the technology review change for the Cyanide Chemicals Manufacturing source category?

The technology review did not change from proposal. Therefore, we are finalizing our determination that no revisions to the NESHAP are necessary pursuant to CAA section 112(d)(6).

3. What key comments did we receive on the technology review, and what are our responses?

We received two comments regarding the proposed technology review and our proposed determination that no revisions were warranted under CAA section 112(d)(6). One commenter suggested changes to our technology review to include additional technologies related to flares and equipment leaks. After review of these comments, we determined that no changes to the standards were necessary because these technologies would not result in cost-effective emission reductions for the cyanide chemicals manufacturing source category. The comments and our specific responses can be found in the document, *Summary of Comments and EPA's Responses on the National Emission Standards for Hazardous Air Pollutants: Cyanide Chemicals Manufacturing Residual Risk and Technology Review Proposed Rule*, which is available in docket: EPA-HQ-OAR-2020-0532.

4. What is the rationale for our final approach and final decisions for the technology review?

Our technology review sought to identify add-on control technology that was not identified during the original NESHAP development and improvements to existing add-on

controls. We also sought to identify new work practices, operational procedures, process changes, pollution prevention alternatives, or techniques that have the potential to reduce emissions. Based on our review, we did not identify any such developments that would result in cost-effective emission reductions for the Cyanide Chemicals Manufacturing source category. Since proposal, no information has been presented to cause us to change the proposed determination. Consequently, we are finalizing our CAA section 112(d)(6) determination as proposed.

C. Amendments Addressing Emissions During Periods of SSM for the Cyanide Chemicals Manufacturing Source Category

1. What amendments did we propose to address emissions during periods of SSM?

Consistent with the 2008 decision in *Sierra Club v. EPA*, the EPA evaluated the Cyanide Chemicals Manufacturing NESHAP requirements to identify the need to eliminate any SSM exemptions in the rule to ensure that standards that apply during normal operations apply at all times. As noted at proposal (86 FR 3906, 3924), the Cyanide Chemicals Manufacturing source category NESHAP did not include an exemption for SSM events, and already included standards that apply at all times, including periods of SSM. Therefore, we determined that the NESHAP was already consistent with *Sierra Club v. EPA*, in which the Court vacated two provisions that exempted sources from the requirement to comply with otherwise applicable CAA section 112(d) emission standards during periods of SSM. However, we proposed revisions to subpart YY at 40 CFR 63.1108 through 40 CFR 63.1112 to remove any references associated with the GMACT that contained SSM exemptions for other source categories and from referenced subparts to reduce confusion. The EPA did not propose any other amendments addressing

emissions during SSM periods because of our determination that the NESHAP already included standards that apply at all times, including periods of SSM.

2. How did the proposed SSM-related amendments change in the final rule?

We are finalizing our proposal to remove SSM exemption language included in 40 CFR 63.1108 through 40 CFR 63.1112 and GMACT referenced subparts.

3. What key comments did we receive on SSM-related emissions and what are our responses?

While one commenter provided support for the EPA's removal of references to provisions that contained SSM exemptions for other source categories and from referenced subparts to reduce confusion, the commenter expressed concern that the EPA had not removed references to SSM exemptions in HON-referenced provisions and that the EPA must assure full removal of SSM exemptions in the final rule to assure compliance with the CAA.

Other commenters expressed concern that the EPA had not established work practice standards to cover situations that they contend had been covered under their SSM plan included under the SSM exemption requirements that were proposed to be removed. The commenter requested that the EPA include provisions for specified circumstances that were previously covered under their SSM plan similar to what was included for the ethylene production source category in subpart YY.

These comments and the EPA's responses to these comments are provided below.

a. Elimination of the SSM Exemption

Comment: One commenter noted that SSM events play a considerable role in the issue of pollution and environmental contamination as these processes increase an industrial plant's pollution and noted concern that the EPA would continue to maintain SSM exemptions in this rule. Another commenter supported the removal of the SSM exemptions, stating that removal of

these provisions is required to assure compliance with the CAA because this is a 'necessary' revision under CAA section 112(d)(6).

Response: As discussed in section V.C.1 of this preamble, we are finalizing revisions (as proposed) to subpart YY at 40 CFR 63.1108 through 40 CFR 63.1112 to remove any references associated with the GMACT that contained SSM exemptions for other source categories and referenced subparts.

Comment: One commenter stated that the EPA's proposed standards are illegal because the HON standard the EPA is proposing to incorporate for wastewater requirements includes the illegal SSM exemption that the EPA admits it must remove from the cyanide chemical manufacturing rules here under CAA section 112(d)(6). The commenter stated that the EPA may not lawfully remove the exemption and then immediately reinstate it by incorporation of an equally illegal SSM exemption in the HON.

Response: The EPA assessed the specific HON wastewater provisions referenced in the proposed Cyanide Chemicals Manufacturing MACT rule and did not identify any language containing exemptions for periods of SSM. The commenter made a general allegation about exemptions and did not identify any specific provisions that contained exemptions. The EPA has therefore not made changes to the final rule based on this comment.

b. Pressure Relief Devices (PRD) in HAP Service

Comment: One commenter stated, "[p]ressure relief discharges to the atmosphere from cyanide chemicals manufacturing covered processes are rare. However, if a discharge from a [PRD] occurs, it would currently be addressed under the SSM plan and the emissions would be reported to the appropriate regulatory entities if the amount is greater than an applicable Reportable Quantity (RQ) for any air contaminant." The commenter contended that, because the

SSM plan will be proposed to be withdrawn 180 days after the rule is amended, "any modifications to the process or additions of emissions control equipment are not feasible in this timeframe." Therefore, the commenter suggested including in this rule the same work practice requirements for PRDs that are in the subpart YY regulation for the ethylene production source category, which the commenter alleges also has a small number of PRDs venting to the atmosphere.

Specifically, the commenter recommended that the EPA incorporate the work practice standards of 40 CFR 63.1107(h)(3) through (8) within the Cyanide Chemicals manufacturing rule in order to "address any potential discharge from a [PRD] that is on fixed equipment and to exempt any [PRD] from infeasible monitoring for portable containers and mobile equipment." The commenter requested that any referenced citations in the aforementioned section be aligned with the Cyanide Chemicals Manufacturing MACT rule and noted that certain ethylene flare provisions are not applicable to this source category.

Additionally, the commenter suggested that the associated recordkeeping and reporting requirements in 40 CFR 63.1109(i) and 63.1110(e)(8) may also be appropriate to add to the rule in support of the PRD work practice standards.

Response: The EPA has not added the provisions requested by the commenter. While these or similar provisions exist in NESHAP for some source categories, the EPA does not have data (nor was sufficient data provided) to demonstrate that such provisions are warranted for the cyanide chemicals manufacturing NESHAP. The commenter requested these provisions be added to the Cyanide Chemicals Manufacturing NESHAP because they exist in the Ethylene Production NESHAP. The commenter did not definitively assert that any PRDs exist that would be subject to this action, nor whether they are controlled or atmospheric PRDs.

The commenter stated that there is insufficient time to implement process modifications/add emissions control equipment within 180 days after the rule is amended. This statement acknowledged that the process can be modified and emissions control equipment can be used to meet standards at all times. Without data to support the need for specific work practice provisions for PRDs, including the prevalence of PRDs, whether they are routed to control devices, the frequency of releases, magnitude of emissions during releases, and costs of further controls, we have insufficient basis to add these requirements for the cyanide chemicals manufacturing source category.

c. Maintenance Vents

Comment: One commenter requested that, since the SSM plan and various exceptions are proposed to be removed within 180 days after the rule is amended, the same work practice requirements for maintenance vents that are in the subpart YY regulation for the ethylene production source category be included "so that it is clear that equipment can be cleared and opened for maintenance or other similar work."

The commenter provided that some covered facilities include similar work practice provisions in Texas New Source Review air permits for routine maintenance activities. According to the commenter, "[i]ncluding provisions for maintenance vents in the final rule will clarify the requirements when these maintenance activities occur."

The commenter suggested the following requirements and options when incorporating the subpart YY regulation for the ethylene production source category maintenance vents language:

- Limit the lower explosive limit (LEL) to 10 percent; and
- Limit the concentration of hydrocarbons or hydrogen cyanide to 500 ppmv measured using one of the following options:

- The use of an instrument that complies with EPA Method 21 in 40 CFR part 60, appendix A (measures total hydrocarbon concentration)
- The use of colorimetric gas detector tubes provided the tube is used in accordance with manufacturer's guidelines (measures hydrogen cyanide concentration); or
- The use of an electrochemical sensor for hydrogen cyanide (measures hydrogen cyanide concentration).

Furthermore, the commenter suggested that the recordkeeping and reporting requirements in 40 CFR 63.1109(f) and 63.1110(e)(5) may also be appropriate to add to the rule in support of the maintenance venting provisions.

Response: The EPA has not made the commenter's suggested revisions. The commenter did not provide sufficient information regarding why they could not meet the standards or why their suggested requirements should be included.

Additionally, neither limiting the LEL to 10 percent nor limiting the concentration to 500 ppmv when considering hydrogen cyanide are defensible. The 10 percent LEL for hydrogen cyanide in air is 5,600 ppm. Hydrogen cyanide is highly toxic by all routes of exposure and may cause central nervous system, cardiovascular, and respiratory effects that could lead to death. The Occupational and Safety and Health Administration (OSHA) has concluded that a variety of symptoms are associated with exposure to hydrogen cyanide at levels less than 10 ppm and has established a 4.7-ppm 15-minute short term exposure limit (STEL) as the permissible exposure limit (PEL).[11]

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[11] *https://www.cdc.gov/niosh/idlh/74908.html*, 1988 OSHA PEL Project - Hydrogen Cyanide | NIOSH | CDC

d. Storage Vessel Degassing – Fixed Roof Storage Tanks

Comment: One commenter requested that the EPA include the same requirements for storage vessel degassing for fixed roof tanks that are in the subpart YY regulation for the ethylene production source category. The commenter suggested the following requirements and options when incorporating the subpart YY regulation for ethylene production storage vessel degassing language:

- Limit the LEL to 10 percent; and
- Limit the concentration of hydrocarbons or hydrogen cyanide to 500 ppmv measured using one of the following options:
    - The use of an instrument that complies with EPA Method 21 in 40 CFR part 60, appendix A (measures total hydrocarbon concentration)
    - The use of colorimetric gas detector tubes provided the tube is used in accordance with manufacturer's guidelines (measures hydrogen cyanide concentration); or
    - The use of an electrochemical sensor for hydrogen cyanide (measures hydrogen cyanide concentration).

Response: The EPA has not made the commenter's requested revisions. However, insufficient information was provided to support their contention that they could not meet the standards during storage vessel degassing or why their suggested requirements should be included.

As discussed in section V.C.3.c above for Maintenance Vents, neither limiting the LEL to 10 percent or limiting the concentration to 500 ppmv when considering hydrogen cyanide are defensible. The 10 percent LEL for hydrogen cyanide in air is 5,600 ppm. Hydrogen cyanide is

highly toxic by all routes of exposure and may cause central nervous system, cardiovascular, and respiratory effects that could lead to death. The OSHA has concluded that a variety of symptoms are associated with exposure to hydrogen cyanide at levels less than 10 ppm and has established a 4.7-ppm 15-minute STEL as the PEL.[12]

4. What is the rationale for our final changes to the SSM-related amendments?

We evaluated all of the comments on the EPA's proposed amendments to the SSM provisions. For the reasons explained in the proposed rule (86 FR 3906, 3924), we determined that these amendments, which remove and revise provisions related to SSM, are necessary to ensure there is no confusion that standards are required to apply at all times, consistent with *Sierra Club v. EPA*. More information concerning the amendments we are finalizing for SSM is in the preamble to the proposed rule and in our specific responses to the comments above (section V.C.3). Therefore, we are finalizing our amendments for the SSM provisions as proposed.

D. Other Technical Amendments to the Cyanide Chemicals Manufacturing NESHAP

1. What wastewater provision amendments did we propose?

As discussed in section II.D of this preamble and in the proposal preamble for the Cyanide Chemicals Manufacturing NESHAP (see 86 FR 3906, 3920-3921), the EPA proposed standards pursuant to CAA sections 112(d)(2) and (d)(3) for process wastewater from existing cyanide chemical manufacturing process units, which was previously unregulated. We proposed that process wastewater sources at existing sources comply with HON wastewater requirements. We proposed the HON requirements for cyanide chemicals manufacturing existing sources

[12] *https://www.cdc.gov/niosh/idlh/74908.html*, 1988 OSHA PEL Project - Hydrogen Cyanide | NIOSH | CDC

because the HON requirements represented: (1) the measures employed by the best performing sources in the category; and (2) an acceptable means of compliance for wastewater emissions at sources subject to subpart YY. We also proposed adding the HON requirements for waste management units upstream of an open or closed biological treatment process to the new source standard to ensure demonstrable compliance measures are in place for these sources.

2. How did the proposed wastewater provision amendments change in the final rule?

We are finalizing the proposed wastewater provision amendments with minor clarifications (see section V.D.3.d).

3. What key comments did we receive on the proposed wastewater provision amendments and what are our responses?

Environmental groups provided comments on the basis for the EPA's selected standards and contended that the proposed limits were not sufficient to satisfy CAA sections 112(d)(2)-(3), which requires the maximum achievable degree of emission limitation.

Industry commenters requested that clarifications of the applicability of the wastewater requirements be included in the final rule and that the EPA provide additional compliance options to what was proposed in the final rule. These commenters also requested that the EPA include a test method for hydrogen cyanide or cyanide compounds in the final rule.

These comments and the EPA's responses are provided below.

a. Basis-Support for Wastewater Provisions

Comment: One commenter supported the EPA's recognition that it must set limits on uncontrolled HAP emissions from process wastewater under CAA section 112(d)(6) —including hydrogen cyanide, acetonitrile, and acrylonitrile,[13] but contended that the limits are not strong

[13] 86 FR at 3920 & n.23, 3921

enough to satisfy CAA sections 112(d)(2)-(3), which requires the maximum achievable degree of emission limitation.

The commenter stated that the EPA proposes "to just require compliance with the [HON] wastewater requirements for process wastewater and upstream waste management units at existing sources—and to add HON requirements for waste management units."[14] The commenter claimed that the EPA does not discuss what the proposed requirements are in the preamble other than referencing the outdated standard.

According to the commenter, the EPA's proposed wastewater standards are "illegally and arbitrarily weak and must be strengthened before finalizing." The commenter stated that the EPA has not performed any floor analysis as required by CAA section 112(d)(3) and instead appears to rely on the outdated 2008 HON rule and old and unreliable data, not included here, as its justification for not requiring stronger wastewater standards. The commenter noted that there is no assessment of what the best-performing standards have achieved, or what the average emission limitation achieved is. The commenter added that the EPA also does not demonstrate that the 2008 HON standards satisfy the CAA sections 112(d)(2)-(3) test for cyanide chemical manufacturing wastewater process sources.

Lastly, the commenter asserted that the EPA's proposed wastewater standards are illegal and arbitrary because the EPA has given only a conclusory statement to attempt to satisfy the beyond-the-floor requirement of CAA section 112(d)(2). According to the commenter, the EPA has failed to show how its proposal reflects the "maximum achievable" degree of emission limitation for these sources. The commenter stated that citing to data not in the record from 2004, without discussion or any rational explanation, does not meet the EPA's statutory obligation. The

[14] 86 FR at 3921.

commenter contended that the EPA should collect current data, review more recent wastewater control methods, and perform a lawful beyond-the-floor analysis to ensure that it requires the "maximum achievable" degree of emission reduction in the final standards.

Response: The EPA evaluated the data available to the Agency at the time the proposed MACT standards for process wastewater at existing cyanide chemicals manufacturing sources were developed. We also reviewed title V permits for all cyanide chemicals manufacturing facilities and determined that all existing facilities subject to the cyanide NESHAP are also subject to the HON wastewater requirements or other NESHAP that also incorporate those requirements. We concluded that these requirements constitute the performance of the best performing facilities in the source category. These standards represent the best measures that we identified for minimizing wastewater emissions from the category, and we did not identify additional measures that could further reduce emissions "beyond the floor". The commenter did not provide any data to support their conclusion that these requirements are not representative of the best performers.

Our conclusion at proposal that the HON process wastewater requirements represent the MACT floor has not changed and we are finalizing those requirements with minor clarifications (see section V.D.3.d of this preamble for minor clarification changes made in the final rule).

b. Fraction Measured (Fm)/Fraction Removal (Fr) Values for Hydrogen Cyanide/Cyanide Compounds

Comment: One commenter recommended that the EPA provide a Fm value for hydrogen cyanide or cyanide compounds so that the regulated entity can comply with the applicability option described in 40 CFR 63.144(b)(1) of subpart G. Similarly, the commenter also requested that the EPA provide a Fr value for hydrogen cyanide or cyanide compounds so that the

regulated entity can comply with the option available in 40 CFR 63.138(e)(2) of subpart G. The commenter recommended that this value would be no greater than 0.93, as it is the removal requirement for new cyanide chemicals manufacturing process units, but also noted it could be less based on the physical properties of hydrogen cyanide or cyanide compounds.

Response: 40 CFR 63.144(b)(1) allows several options for determining how to calculate the annual average concentration, including knowledge of the wastewater, bench-scale or pilot scale test data, or test data from sampling at the point of determination or at a location downstream of the point of determination. For free cyanide, the final rule adds specific procedures for determining the annual average concentration of free cyanide (see 40 CFR 63.1103(g)(5)(vi) of the final rule). For compliance with the wastewater free cyanide analysis provisions of Table 9 to 40 CFR 63.1103(g), free cyanide is to be measured according to ASTM D4282-15 (Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion) or ASTM D7237 (Standard Test Method for Free Cyanide and Aquatic Free Cyanide with Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection). Under 40 CFR 63.144(b)(1) of subpart G, Fm adjustment factors are allowed under specified circumstances (e.g., when concentration is determined by Method 305 as specified in 40 CFR 63.144(b)(5)(i)(B), concentration may be adjusted by dividing by the compound-specific Fm). For free cyanide measured according to ASTM D4282-15 or ASTM D7237 (as required under the final rule), the EPA is not including an Fm adjustment factor option.

In addition to the compliance option available under 40 CFR 63.138(e)(2) of the rule that requires an Fr value to demonstrate compliance, an owner or operator has other compliance options that do not require an Fr value. However, the EPA acknowledges that existing sources

complying with 40 CFR part 63 subpart G wastewater provisions may already be complying with wastewater requirements under the 40 CFR part 63 subpart G wastewater provisions that require an Fr value for individual HAP in order to demonstrate compliance. To allow flexibility to owners and operators in complying with the process wastewater options that we proposed for cyanide chemicals manufacturing existing sources under 40 CFR 63.138(a)(1), the final rule has added that, for compliance options and calculations requiring an Fr value under 40 CFR 63.138(a)(1), an owner or operator may use a value of 0.93 for free cyanide (see Table 9 to 40 CFR 63.1103(g), line entry (g) of the final rule). This value is based on the requirement that new sources meet an emissions control level of 93 percent for process wastewater streams.

c. Hydrogen Cyanide/Cyanide Compound Test Methods to Measure Wastewater Stream Concentration

Comment: One commenter stated that the HON regulation includes a number of options for determining the concentration of the regulated organic HAP compounds in a process wastewater stream. The commenter provided that the existing 40 CFR 63.144(b)(5)(i) of the HON regulation does not have a listed test method for hydrogen cyanide or cyanide compounds. The commenter recommended that the EPA include any approved test methods in Table 1B of 40 CFR 136.3 in the final Cyanide Chemicals manufacturing rule (subpart YY) for these measurements that the regulated entity can use if they opt to make measurements.

The commenter also requested that EPA include any updates to the test method(s) automatically in the rule as an option for the regulated entities to use. The commenter suggested that, if EPA Method 335.4 is updated in the future, the regulated entity should be able to use either EPA Method 335.4 or the updated method.

Response: The EPA has added 40 CFR 63.1103(g)(5)(vi) to include two test methods for measuring the concentration of cyanide in water (ASTM 4282-15 and ASTM 7237-18). The test methods in the table submitted by the commenter were not included because they corresponded to parameters that were irrelevant (total cyanide concentration and available cyanide concentration) or were, subsequent to the submission of the comment, supplanted by a new version of the method in Table 1B. Available cyanide refers to cyanide that is loosely bound in metal-ion complexes, and total cyanide refers to the sum of available and free cyanide. Free cyanide is toxic and bioavailable cyanide, and this is the form of cyanide that the EPA intends to limit. Table 1B of 40 CFR 136.3 was updated July 19, 2021 (86 FR 27226) to incorporate updated versions of the free cyanide methods. The updated versions of the two ASTM methods for free cyanide are included in the final rule, but the OI Analytical method was excluded, as the method text actually describes how to measure available cyanide and does not include information on the modifications necessary to test for free cyanide. EPA Method 335.4 was not included as this method is only available in draft and has not yet been finalized.

d. Request for Clarifications

Comment: One commenter requested that the EPA clarify the text in the proposed paragraph (g) of Table 9 of the proposed 40 CFR part 63 subpart YY regulation to confirm that the provisions apply to each individual wastewater stream.

Response: The EPA has revised line entries (g)(1) and (g)(2) (for existing sources) of Table 9 to 63.1103(g) in the final rule as recommended by the commenter to clarify the EPA's intent that the wastewater requirements apply to each individual wastewater stream.

Comment: One commenter recommended that the EPA clarify that the term "cyanide compounds" is the same as "cyanide chemicals product".

Response: The EPA has added a definition for the term "free cyanide" in 40 CFR 63.1103(g)(2) to clarify the EPA's intent that hydrogen cyanide and cyanide ion (both of which may be present in wastewater due to dissolution of cyanide salts) are the cyanide chemical compounds subject to the Cyanide Chemicals Manufacturing source category wastewater provisions.

4. What is the rationale for our final changes to proposed wastewater provision amendments?

We evaluated the comments on the EPA's proposed process wastewater amendments for existing and new sources. For the reasons explained in the proposed rule (86 FR 3906, 3920-3921), we determined that the process wastewater amendments for existing and new sources are necessary to ensure all affected sources in the cyanide chemicals manufacturing source category are subject to MACT standards, and that the requirements for waste management units upstream of an open or closed biological treatment process for new sources are necessary to ensure demonstrable compliance measures are in place for these sources. More information concerning the amendments we are finalizing is in the preamble to the proposed rule and in our specific responses to the comments above (section V.D.3). Therefore, we are finalizing the wastewater amendments as proposed, with minor clarifications (see section V.D.3.b-e).

VI. Summary of Cost, Environmental, and Economic Impacts and Additional Analyses Conducted

A summary of cost, environmental, and economic impacts is presented in section VI.A for the Carbon Black Production NESHAP and section VI.B for Cyanide Chemicals Manufacturing NESHAP final rule amendments.

A. Carbon Black Production

1. What are the affected facilities?

The EPA estimates that there are 15 production facilities in the Carbon Black Production major source category that are subject to the Carbon Black Production NESHAP and affected by the final amendments to 40 CFR part 63, subpart YY. The basis of our estimates of affected facilities is provided in the memorandum, *Identification of Major Sources for the Carbon Black Production NESHAP*, which is available in the docket for this action (see Docket ID No. EPA-HQ-OAR-2020-0505-0022). We are not currently aware of any planned or potential new or reconstructed carbon black production facilities in the source category. No carbon black production area sources were identified; therefore, there are no area sources subject to this rulemaking.

2. What are the air quality impacts?

While we are broadening the scope of the current Carbon Black Production standard, setting annual tune-up requirements for process heaters and boilers, removing the SSM exemption, and establishing a work practice standard for periods of startup and shutdown, we do not have data to determine quantitatively the reduction in HAP emissions resulting from this action. Through discussions with industry members, it is our understanding that process vents located after the MUF are likely already below the applicability threshold where additional controls will be required. The other requirements we are adding are based on current industry practices. For this reason, we do not anticipate that this action will result in significant HAP emission reductions.

3. What are the cost impacts?

Costs were developed on a per facility basis for Carbon Black Production facilities, and all facilities were determined to have similar costs. Costs are presented in 2019 dollars. Costs

were broken into three separate categories based on final requirements: Initial Applicability Test, Performance Test, and Boiler/Process Heater Maintenance Costs.

Initial applicability testing costs include costs associated with the final requirements for process vents located after the MUF to meet the standard, which will require facilities to determine whether emissions control is needed for process vents after the MUF process vent. We estimate this to be a one-time cost of $21,350 per facility, due to the assumption that the majority of HAP is removed and controlled at the MUF, which likely results in the vent stream concentration located after the MUF falling below the HAP applicability concentration threshold (260 ppmv).

Performance test costs include costs associated with the requirement to conduct emissions tests at the subject process vents every 5 years starting in the first year after promulgation. Based on our understanding of industry practices and emissions profiles, we do not expect any process vents located after the MUF to exceed the applicability threshold, which would require them to conduct performance tests. Facilities must conduct performance tests no more than 60 months after the preceding test when demonstrating compliance with process vent emission control requirements. We estimate that 20 percent of subject facilities will conduct a performance test each year resulting in an annual cost of $15,241 per facility.

Boiler/process heater maintenance costs include costs associated with the final requirement to ensure that boilers and process heaters are operating at peak efficiency and not creating excess emissions through inefficient operation. Initial tune-up costs are assumed to be higher to get the units back to peak efficiency. We assume that subsequent year costs would be lower because less maintenance would be needed. As such, we estimate the initial tune-up cost to be $6,750 per facility and subsequent annual tune-ups to cost $1,350 per facility.

Costs were based primarily on labor, equipment, and travel costs. Labor costs are based on Bureau of Labor Statistics data for relevant employees necessary to perform the tests and maintenance. A detailed cost analysis can be found in the memorandum, *Carbon Black Cost Memorandum*, available in the docket for this action (see Docket ID No. EPA-HQ-OAR-2020-0505-0007).

4. What are the economic impacts?

Economic impact analyses focus on changes in market prices and output levels. If changes in market prices and output levels in the primary markets are significant enough, impacts on other markets may also be examined. Both the magnitude of costs associated with the final requirements and the distribution of these costs among affected facilities can have a role in determining how the market will change in response to a final rule. Economic costs to carbon black producers were measured in Present Value (PV) total costs and Equivalent Annual Value (EAV) costs. All producer facilities were estimated to have similar costs. All costs are presented in 2019 dollars. Refer to the memorandum, *Carbon Black Economic Impact Analysis*, in the docket for this rulemaking for more information (see Docket ID No. EPA-HQ-OAR-2020-0505-0008). PV total costs and EAV costs were measured at the 3-percent and 7-percent discount rate. The duration of analysis was 10 years which represented two full cycles of cost analysis for the final requirements. Per facility PV total costs were estimated to be $70,000 and $63,000 at the 3-percent and 7-percent discount rates, respectively. EAV costs per facility were estimated to be $8,000 and $9,000 at the 3-percent and 7-percent discount rates, respectively. The combined PV total cost of the final requirements for all facilities was estimated to be $1,005,000 and $945,000 at the 3-percent and 7-percent discount rates, respectively. The combined EAV cost of the final requirements for all facilities was estimated to be $118,000 and $135,000 at the 3-percent and 7-

percent discount rates, respectively. No carbon black production facilities subject to this rule are small businesses based on Small Business Administration standards. Because the PV and EAV costs associated with the final revisions are minimal, no significant economic impacts from the final amendments are anticipated. Refer to the *Carbon Black Economic Impact Memorandum*, available in the docket (see Docket ID No. EPA-HQ-OAR-2020-0505-0008), for more information.

5. What are the benefits?

As discussed in section VI.A.2 of this preamble, we do not anticipate the finalized amendments to the Carbon Black Production source category to significantly impact air quality. The electronic submittal of the reports addressed in this rulemaking will increase the usefulness of the data contained in those reports; is in keeping with current trends in data availability and transparency; will further assist in the protection of public health and the environment; will improve compliance by facilitating the ability of regulated facilities to demonstrate compliance with requirements; will improve compliance by facilitating the ability of delegated state, local, tribal, and territorial air agencies and the EPA to assess and determine compliance; and will ultimately reduce burden on regulated facilities, delegated air agencies, and the EPA. Electronic reporting also eliminates 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.

Although the EPA does not anticipate any significant reductions in HAP emissions as a result of the final amendments to the Carbon Black Production NESHAP, we believe that the final action will result in improvements to the rule by broadening the current emission limit,

requiring an annual tune-up for boilers and process heaters, and revising the SSM standards such that a standard applies at all times, including periods covered by the final work practice standard. Additionally, the final amendments requiring electronic submittal of NOCS reports, performance test results, and periodic reports will increase the usefulness of the data, are in keeping with current trends of data availability, will further assist in the protection of public health and the environment, and will ultimately result in reduced reporting burden on the regulated community.

6. What analysis of environmental justice did we conduct?

Executive Order 12898 directs the EPA staff to identify the populations of concern who are most likely to experience unequal burdens from environmental harms; specifically, minority populations, low-income populations, and indigenous peoples (59 FR 7629, February 16, 1994). Additionally, Executive Order 13985 was signed to advance racial equity and support underserved communities through federal government actions (86 FR 7009, January 20, 2021). The EPA defines environmental justice (EJ) as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The EPA further defines the term fair treatment to mean that "no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies" (*https://www.epa.gov/environmentaljustice*). In recognizing that minority and low-income populations often bear an unequal burden of environmental harms and risks, the EPA continues to consider ways of protecting them from adverse public health and environmental effects of air pollution.

To examine the potential for any EJ issues that might be associated with the source category, we performed a demographic analysis, which is an assessment of risks to individual demographic groups of the populations living within 5 km and within 50 km of the facilities. In the analysis, we also evaluated the distribution of HAP-related cancer and noncancer risks from the Carbon Black Production major source category across different demographic groups within the populations living near facilities. The demographic analysis and the risk analysis are contained in the docket and were summarized in the proposed rule preamble.

When examining the risk levels of those exposed to emissions from carbon black production facilities, we find that no one is exposed to a cancer risk at or above 1-in-1 million or to a chronic noncancer TOSHI greater than 1.

Results of the demographic analysis indicate that, of the total population residing within 5km of facilities in the source category, the percentages of people who are African American, age greater than or equal to 65, age greater than or equal to 25 years of age without a high school diploma, and below the poverty level are greater than the national average percentages of people in those demographic groups. The EPA also provided demographic results for populations residing within 50km.

Based on analyses of exposed populations, the EPA determined that this action is unlikely to pose a disproportionately high adverse health impact on minority populations and/or low-income populations, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994) and referenced in Executive Order 13985 (86 FR 7009, January 20, 2021).

The methodology and the results of the demographic analysis are presented in a technical report, *Risk and Technology Review—Analysis of Demographic Factors for Populations Living Near Carbon Black Production Source Category Operations*, available in the docket for the

Carbon Black Production source category NESHAP (see Docket Item No. EPA-HQ-OAR-2020-0505-0014).

7. What analysis of children's environmental health did we conduct?

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866 and because the EPA does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. This action's health and risk assessment are documented in the risk report, *Residual Risk Assessment for the Carbon Black Production Source Category in Support of the Risk and Technology Review 2021 Final Rule*, available in the docket for the Carbon Black Production source category NESHAP (see Docket No. EPA-HQ-OAR-2020-0505).

B. Cyanide Chemicals Manufacturing

1. What are the affected facilities?

There are 13 cyanide chemicals manufacturing facilities currently operating as major sources of HAP subject to the final amendments. A list of facilities that are currently subject to the MACT standards is available in the memorandum titled *Technical Support Document for the Cyanide Chemicals Manufacturing NESHAP Residual Risk and Technology Review Proposal*, available in the docket for this action (see Docket ID No. EPA-HQ-OAR-2020-0532-0025).

2. What are the air quality impacts?

The final amendments add wastewater requirements to the Cyanide Chemicals Manufacturing NESHAP, however the EPA does not anticipate that the amendments to the cyanide chemicals manufacturing NESHAP will impact air quality. We are not proposing changes to the standard that will result in additional emission reductions beyond the levels already achieved by the NESHAP.

3. What are the cost impacts?

The final amendments will have a limited cost impact on affected cyanide chemicals manufacturing facilities. Total estimated costs are $47,527, based on a $3,656 per facility cost for all 13 facilities. The costs result from reading and understanding rule requirements and adjusting compliance plans based on the rule proposal. All costs other than wastewater testing are one-time expenses expected to occur in the first year after the rule is finalized. Costs are based on Agency knowledge and experience with the NESHAP program, related Information Collection Requests (ICRs), and Bureau of Labor Statistics data.

4. What are the economic impacts for Cyanide Chemicals Manufacturing?

Economic impact analyses focus on changes in market prices and output levels. If changes in market prices and output levels in the primary markets are significant enough, impacts on other markets may also be examined. Both the magnitude of costs associated with the final requirements and the distribution of these costs among affected facilities can have a role in determining how the market will change in response to a rule.

Economic costs to owners of Cyanide Chemicals Manufacturing facilities were measured in PV total costs and EAV costs. All Cyanide Chemicals Manufacturing facilities were estimated to have similar costs. All costs are presented in 2019 dollars.

PV total costs and EAV costs were measured at the 3 percent and 7 percent discount rates. The duration of analysis was 8 years. Per facility PV total cost estimate is $3,968 at 3 percent and $3,925 at 7 percent discount rates. EAV costs per facility are measured to be $565 and $657 at the 3 percent and 7 percent discount rates, respectively. Combined total PV cost of the final requirements for all facilities is measured to be $51,577 at 3 percent and $51,030 at 7

percent discount rates. Combined EAV costs of the final requirements for all facilities are measured to be $7,346 and $8,546 at the 3 percent and 7 percent discount rates, respectively.

As required by the Regulatory Flexibility Act (RFA), we performed an analysis to determine if any small entities would be unduly burdened by the final amendments. No cyanide chemicals manufacturers are small businesses based on Small Business Administration standards. No significant economic impacts from the final amendments are anticipated because the PV and EAV costs associated with the final revisions are minimal.

5. What are the benefits?

As discussed in section VI.B.2 of this preamble, we do not anticipate the finalized amendments to the NESHAP for the Cyanide Chemicals Manufacturing source category to impact air quality. The electronic submittal of the reports addressed in this rulemaking will increase the usefulness of the data contained in those reports, is in keeping with current trends in data availability and transparency, will further assist in the protection of public health and the environment, will improve compliance by facilitating the ability of regulated facilities to demonstrate compliance with requirements and, by facilitating the ability of delegated state, local, tribal, and territorial air agencies and the EPA to assess and determine compliance, will ultimately reduce burden on regulated facilities, delegated air agencies, and the EPA. Electronic reporting also eliminates 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.

6. What analysis of environmental justice did we conduct?

Executive Order 12898 (59 FR 7629, February 16, 1994) directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations. Additionally, Executive Order 13985 was signed to advance racial equity and support underserved communities through federal government actions (86 FR 7009, January 20, 2021). The EPA defines EJ as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The EPA further defines the term fair treatment to mean that "no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies" (*https://www.epa.gov/environmentaljustice*). In recognizing that minority and low-income populations often bear an unequal burden of environmental harms and risks, the EPA continues to consider ways of protecting them from adverse public health and environmental effects of air pollution.

To examine the potential for any EJ issues that might be associated with the source category, we performed a demographic analysis, which is an assessment of risks to individual demographic groups of the populations living within 5 km and within 50 km of the facilities. In the analysis, we also evaluated the distribution of HAP-related cancer and noncancer risks from the Cyanide Chemicals Manufacturing major source category across different demographic groups within the populations living near facilities. The demographic analysis and the risk analysis are contained in the docket and were summarized in the proposed rule preamble.

When examining the risk levels of those exposed to emissions from cyanide chemical manufacturing facilities, we find that 61,653 people nationwide are exposed to an incremental cancer risk at or above 1-in-1 million with no one exposed to an excess cancer risk greater than 5-in-1 million based upon actual or allowable emissions. Also, no people are exposed to a chronic noncancer TOSHI greater than 1.

Results of the demographic analysis indicate that of the 61,653 people residing within 50 km of facilities in the source category whose risk is at or above 1-in-1 million (but less than 5-in-1 million) as a result of emissions from the source category, the percent of individuals in three demographic groups, African American, below poverty level, and greater than or equal to 25 years of age without a high school diploma, are greater than the corresponding national average percentage of people in those demographic groups. Specifically, the population with risks greater than 1-in-1 million live in areas where 19 percent of the population is African American compared to 12 percent nationally, 23 percent are below the poverty level[15] compared to 14 percent nationally, and 16 percent are greater than or equal to 25 years of age without a high school diploma compared to 14 percent nationally. Because the final amendments to the rule are not anticipated to result in emissions reductions, implementation of the final rule will not result in a significant increase or decrease in any existing risk disparities for the demographic groups.

Based on the analyses of exposed populations described above, the EPA determined that this action is unlikely to pose a disproportionately high and adverse health impact on minority populations and/or low-income populations, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994) and referenced in Executive Order 13985 (86 FR 7009, January 20, 2021).

[15] Table 2 of the proposed rule preamble erroneously listed this percentage as 16 percent rather than 23 percent.

The methodology and the results of the demographic analysis are presented in a technical report, *Risk and Technology Review—Analysis of Demographic Factors for Populations Living Near Cyanide Chemicals Manufacturing Source Category Operations*, available in the docket for this action; (see Docket Item No. EPA-HQ-OAR-2020-0532-0006).

7. What analysis of children's environmental health did we conduct?

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because the EPA does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. This action's health and risk assessment are documented in the risk report, *Residual Risk Assessment for the Cyanide Chemicals Manufacturing Source Category in Support of the Risk and Technology Review 2021 Final Rule*, available in the docket for the Cyanide Chemicals Manufacturing source category rule (see Docket No. EPA-HQ-OAR-2020-0532).

VII. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at *https://www.epa.gov/laws-regulations/laws-and-executive-orders*.

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

This action is not a significant regulatory action and was, therefore, not submitted to OMB for review.

B. Paperwork Reduction Act (PRA)

Section VII.B.1 presents PRA considerations related to the Carbon Black Production NESHAP, and section VII.B.2 presents the PRA considerations related to the Cyanide Chemicals Manufacturing NESHAP.

1. Carbon Black Production

The information collection activities in the final rule for the Carbon Black Production source category have been submitted for approval to the OMB under the PRA. The ICR document that the EPA prepared has been assigned EPA ICR number 2677.02. A copy of the ICR is available in the docket for the Carbon Black Production source category NESHAP (see Docket No. EPA-HQ-OAR-2020-0505), and is briefly summarized here. We are finalizing changes to the recordkeeping and reporting requirements associated with 40 CFR part 63, subpart YY, in the form of eliminating the SSM plan and reporting requirements; broadening the initial emission limit to include process vents located after the MUF; and including the requirement for electronic submittal of reports. In addition, the number of facilities subject to the standards changed. The number of respondents was reduced from 18 to 15 based on consultation with industry representatives and state and local agencies.

Respondents/affected entities: The respondents to the recordkeeping and reporting requirements are owners and operators of carbon black production facilities subject to 40 CFR part 63, subpart YY.

Respondent's obligation to respond: Mandatory (40 CFR part 63, subpart YY).

Estimated number of respondents: 15 facilities.

Frequency of response: The frequency of responses varies depending on the burden item. Responses include one-time review of rule amendments, reports of periodic performance tests, and semiannual compliance reports.

Total estimated burden: The annual recordkeeping and reporting burden for responding facilities to comply with all of the requirements in the NESHAP, averaged over the 3 years of this ICR, is estimated to be 289 hours (per year). The average annual burden to the Agency over

the 3 years after the amendments are final is estimated to be 213 hours (per year) for the Agency. Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: The annual recordkeeping and reporting cost for responding facilities to comply with all of the requirements in the NESHAP, averaged over the 3 years of this ICR, is estimated to be $180,928 (per year). There are no estimated capital and operation and maintenance costs. The total average annual Agency cost over the first 3 years after the amendments are final is estimated to be $10,247. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the EPA's regulations in 40 CFR are listed in 40 CFR part 9.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the EPA's regulations in 40 CFR are listed in 40 CFR part 9. When OMB approves this ICR, the Agency will announce that approval in the *Federal Register* and publish a technical amendment to 40 CFR part 9 to display the OMB control number for the approved information collection activities in this final rule.

2. Cyanide Chemicals Manufacturing

The information collection activities in the final rule have been submitted to the OMB under the PRA. The ICR document that the EPA prepared has been assigned EPA ICR number 2678.02. A copy of the ICR is available in the docket for the Cyanide Chemicals Manufacturing source category NESHAP (see Docket No. EPA-HQ-OAR-2020-0532), and is briefly summarized here.

The EPA is finalizing amendments that revise provisions pertaining to emissions during periods of SSM, add requirements for electronic reporting of NOCS, periodic reports, and performance test results, and make other minor clarifications and corrections. This information will be collected to assure compliance with the Cyanide Chemicals Manufacturing NESHAP. The ICR burdens for these final amendments are summarized below.

Respondents/affected entities: Owners or operators of cyanide chemicals manufacturing facilities.

Respondent's obligation to respond: Mandatory (40 CFR part 63, subpart YY).

Estimated number of respondents: 13 (assumes no new respondents over the next 3 years).

Frequency of response: Initially, occasionally, and annually.

Total estimated burden: 169 hours (per year) to comply with all of the requirements in the NESHAP. Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: $17,108 (per year). Includes total capital costs of $1,300 incurred in the first year ($433 per year over 3 years) for process wastewater stream sampling to determine applicability and compliance with the final rule amendments. There are no annualized operation and maintenance costs to comply with under the final amendments to the NESHAP.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the EPA's regulations in 40 CFR are listed in 40 CFR part 9. When OMB approves this ICR, the Agency will announce that approval in the *Federal Register* and publish a technical amendment to 40 CFR part 9 to display the OMB control number for the approved information collection activities in this final rule.

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. This action will not impose any requirements on small entities, since there are no small entities in the affected source categories.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. The action imposes no enforceable duty on any state, local, or tribal governments or the private sector.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

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

This action does not have tribal implications as specified in Executive Order 13175. None of the carbon black production or cyanide chemicals manufacturing production facilities that have been identified as being affected by this proposed action are owned or operated by tribal governments. However, we determined that one carbon black facility and two cyanide facilities are located within 50 miles of tribal lands. Consistent with the EPA Policy on Coordination and Consultation with Indian Tribes, the EPA offered tribal leadership the opportunity for government-to-government consultation with no response. In addition, the EPA held multiple outreach activities that included a webinar and participation on tribal partnership calls.

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

This action is not subject to Executive Order 13045 because the EPA does not believe the environmental health risks or safety risks addressed by this action present a disproportionate risk to children.

The health and risk assessments for the Carbon Black Production and Cyanide Chemicals Manufacturing source categories are discussed in sections IV.A and V.A of this preamble. The document, *Residual Risk Assessment for the Carbon Black Production Source Category in Support of the Risk and Technology Review 2021 Final Rule*, is available in the docket for the Carbon Black Production source category (see Docket ID No. EPA-HQ-OAR-2020-0505). The document, *Residual Risk Assessment for the Cyanide Chemicals Manufacturing Source Category in Support of the Risk and Technology Review 2021 Final Rule*, is available in the docket for the Cyanide Chemicals Manufacturing source category (see Docket ID No. EPA-HQ-OAR-2020-0532).

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

This action is not subject to Executive Order 13211, because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act (NTTAA) and 1 CFR part 51

This action does not involve technical standards for the Carbon Black Production source category.

This action does involve technical standards for the Cyanide Chemicals Manufacturing source category. Therefore, the EPA conducted a search to identify potentially applicable

voluntary consensus standards (VCS). However, the Agency identified no such standards. A thorough summary of the search and results are included in the memorandum titled *Voluntary Consensus Standard Results for Cyanide Chemicals Manufacturing Residual Risk and Technology Review*, which is available in the docket for this action/source category (see Docket ID No. EPA-HQ-OAR-2020-0532-0004).

In the final rule, the EPA is incorporating by reference the VCS ASTM D4282-15, Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion and ASTM D7237-18, Standard Test Method for Free Cyanide and Aquatic Free Cyanide with Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection. Both methods are water and wastewater methods for the determination of free cyanide. In ASTM D4282-15, the reactions are carried out in a microdiffusion cell. The sample is treated with cadmium ion to precipitate hexacyanoferrates and buffered to pH 6. The HCN then diffuses into a sodium hydroxide solution which is subsequently treated, and the concentration of free cyanide determined by spectrophotometric analysis. In ASTM-7237-18, the sample is introduced into the carrier solution of the flow injection analysis system with a phosphate buffer solution at pH 6. The released hydrogen cyanide gas diffuses through a hydrophobic gas diffusion membrane into an alkaline receptor stream where the cyanide ion is captured and sent to an amperometric flowcell detector with a silver-working electrode. In the presence of cyanide, silver in the working electrode is oxidized at the applied potential. The anodic current measured if proportional to the concentration of cyanide in the sample. These methods are reasonably available from ASTM at *https://www.astm.org* or 1100 Barr Harbor Drive, West Conshohocken, PA 19428–2959, telephone number: (610) 832–9500, fax number: (610) 832-9555 email: *service@astm.org*.

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

The EPA believes that this final action for both the Carbon Black Production source category and the Cyanide Chemicals Manufacturing source category does not have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, and/or indigenous peoples, as specified in Executive Order 12898.

The documentation for this decision for the Carbon Black Production source category is contained in the technical report, *Risk and Technology Review—Analysis of Demographic Factors for Populations Living Near Carbon Black Production Facilities*, available in the docket for this action (see Docket ID No. EPA-HQ-OAR-2020-0505-0014) and discussed in Section VI.A.6 of this final rule.

The documentation for this decision for the Cyanide Chemicals Manufacturing is contained in the technical report, *Risk and Technology Review—Analysis of Demographic Factors for Populations Living Near Cyanide Chemicals Manufacturing Facilities*, available in the docket for this action (see Docket ID No. EPA-HQ-OAR-2020-0532-0006) and discussed in Section VI.B.6 of this final rule.

The EPA provided opportunities to engage with the EPA on these proposals. The Agency offered a public hearing and also reached out to communities in other ways, including a webinar held on February 10, 2021, to exchange information with stakeholders about these proposals. We did not receive any requests for a public hearing and we did not receive feedback regarding EJ during the webinar. The EPA remains committed to engaging with communities and stakeholders throughout the development of air pollution regulations.

K. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report for this action to each House of the Congress and to the Comptroller General of the United States. Neither of the NESHAP amended by this action constitute a "major rule" as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 63

Environmental protection, Administrative practice and procedures, Air pollution control, Hazardous substances, Incorporation by reference, Intergovernmental relations, Reporting and recordkeeping requirements.

Michael S. Regan,

Administrator.

For the reasons stated in the preamble, the Environmental Protection Agency is amending part 63 of title 40, chapter I, of the Code of Federal Regulations as follows:

PART 63—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES

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

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

Subpart A—General Provisions

2. Section 63.14 is amended by:

a. Redesignating paragraphs (h)(105) through (h)(117) as (h)(107) through (h)(119);

b. Redesignating paragraphs (h)(63) through (h)(104) as (h)(64) through (h)(105);

c. Adding new paragraphs (h)(63) and (h)(106);

The additions read as follows:

§63.14 Incorporations by reference.

* * * * *

(h) * * *

(63) ASTM D4282-15, Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion, Approved July 15, 2015, IBR approved for §63.1103(g).

* * * * *

(106) ASTM D7237-18, Standard Test Method for Free Cyanide and Aquatic Free Cyanide with Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection, Approved December 1, 2018, IBR approved for §63.1103(g).

* * * * *

Subpart YY—National Emission Standards for Hazardous Air Pollutants for Source Categories: Generic Maximum Achievable Control Technology Standards

3. Section 63.1101 is amended by revising the definition for "Process vent" to read as follows:

§63.1101 Definitions.

* * * * *

Process vent means the point of discharge to the atmosphere (or the point of entry into a control device, if any) of a gas stream from a unit operation within a source category subject to this subpart. Process vent excludes the following gas stream discharges:

(1) Relief valve discharges;

(2) Leaks from equipment subject to this subpart;

(3) Gas streams exiting a control device complying with this subpart;

(4) Gas streams transferred to other processes (on-site or off-site) for reaction or other use in another process (i.e., for chemical value as a product, isolated intermediate, byproduct, or co-product for heat value);

(5) Gas streams transferred for fuel value (*i.e.,* net positive heating value), use, reuse, or sale for fuel value, use, or reuse. On or after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]** this exclusion no longer applies to the Carbon Black Production source category;

(6) Gas streams from storage vessels or transfer racks subject to this subpart;

(7) Gas streams from waste management units subject to this subpart;

(8) Gas streams from wastewater streams subject to this subpart;

(9) Gas streams exiting process analyzers; and

(10) Gas stream discharges that contain less than or equal to 0.005 weight-percent total organic HAP.

* * * * *

4. Section 63.1102 is amended by revising paragraph (a) introductory text and adding paragraphs (d) and (e) to read as follows:

§63.1102 Compliance schedule.

(a) *General requirements.* Affected sources, as defined in §63.1103(a)(1)(i) for acetyl resins production, §63.1103(b)(1)(i) for acrylic and modacrylic fiber production, §63.1103(c)(1)(i) for hydrogen fluoride production, §63.1103(d)(1)(i) for polycarbonate production, §63.1103(e)(1)(i) for ethylene production, §63.1103(f)(1)(i) for carbon black production, §63.1103(g)(1)(i) for cyanide chemicals manufacturing, or §63.1103(h)(1)(i) for spandex production shall comply with the appropriate provisions of this subpart and the subparts referenced by this subpart YY according to the schedule in paragraph (a)(1) or (2) of this section, as appropriate, except as provided in paragraph (b) of this section. Affected sources in ethylene production also must comply according to paragraph (c) of this section. Affected sources in cyanide chemicals manufacturing also must comply according to paragraph (d) of this section. Affected sources in carbon black production also must comply according to paragraph (e) of this section. Proposal and effective dates are specified in table 1 to this section and in paragraph (d) for cyanide chemicals manufacturing affected sources and paragraph (e) for carbon black production affected sources of this section.

* * * * *

(d) *Cyanide chemicals manufacturing*. (1) If applicable, all cyanide chemicals manufacturing affected sources that commenced construction or reconstruction on or before

January 15, 2021, must be in compliance with the requirements listed in paragraphs (d)(1)(i) and (ii) of this section upon initial startup or **[INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, whichever is later. If applicable, all cyanide chemicals manufacturing affected sources that commenced construction or reconstruction after January 15, 2021, must be in compliance with the requirements listed in paragraphs (d)(1)(i) and (ii) of this section upon initial startup, or **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, whichever is later.

(i) Requirements specified in Table 9 to §63.1103(g), table entry (f)(1)(ii), for new cyanide chemicals manufacturing process units that generate process wastewater.

(ii) Requirements specified in Table 9 to §63.1103(g), table entry (g), for existing cyanide chemicals manufacturing process units that generate process wastewater.

(2) All cyanide chemicals manufacturing affected sources that commenced construction or reconstruction on or before January 15, 2021, must be in compliance with the requirements listed in paragraphs (d)(2)(i) through (iii) of this section upon initial startup or **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, whichever is later. All cyanide chemicals manufacturing affected sources that commenced construction or reconstruction after January 15, 2021, must be in compliance with the requirements listed in paragraphs (d)(2)(i) through (iii) of this section upon initial startup, or **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, whichever is later.

(i) The exceptions specified in §63.1103(g)(6) related to 40 part 63, subparts SS, TT, and UU startup, shutdown, and malfunction requirements.

(ii) The compliance requirements specified in §63.1108(a)(4)(i), (b)(1)(ii), (b)(2), and (b)(4)(ii)(B).

(iii) The electronic reporting requirements specified in §63.1110(a)(10).

(e) *Carbon black production.*

(1) If applicable, all carbon black production affected sources that commenced construction or reconstruction on or before January 14, 2021, must be in compliance with the requirements listed in paragraphs (e)(1)(i) through (iii) of this section upon initial startup or **[INSERT DATE ONE YEAR AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, whichever is later. If applicable, all carbon black production affected sources that commenced construction or reconstruction after January 14, 2021, must be in compliance with the requirements listed in paragraphs (e)(1)(i) through (iii) of this section upon initial startup, or **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, whichever is later.

(i) The process vent applicability determination requirements specified in §63.1103(f)(3)(iv).

(ii) The performance test frequency requirements specified in §63.1108(b)(4)(ii).

(iii) The boiler and process heater tune up requirements specified in §63.1103(f)(3)(iii).

(2) All carbon black production affected sources that commenced construction or reconstruction on or before January 14, 2021, must be in compliance with the requirements listed in paragraphs (e)(2)(i) through (iv) of this section upon initial startup **or [INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, whichever is later. All carbon black production affected sources that commenced construction or reconstruction after January 14, 2021, must be in compliance with the requirements listed in paragraphs (e)(2)(i) through (iv) of this section upon initial startup, or **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, whichever is later.

(i) The exceptions specified in §63.1103(f)(4) related to 40 part 63, subpart SS, startup, shutdown, and malfunction requirements.

(ii) The exception specified in §63.1103(f)(5) related to the requirement that a closed vent system route the collected vapors to a control device when demonstrating compliance.

(iii) The compliance requirements specified in §63.1108(a)(4)(i), (b)(1)(ii), (b)(2), and (b)(4)(ii)(B).

(iv) The electronic reporting requirements specified in §63.1110(a)(10).

(3) All carbon black production affected sources that commenced construction or reconstruction on or before January 14, 2021, must be in compliance with the requirements specified in line entry (b) in Table 8 to §63.1103(f) on or before **[INSERT DATE THREE YEARS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. All carbon black production affected sources that commenced construction or reconstruction after January 14, 2021, must be in compliance with the requirements specified in line entries (b) and (c) in Table 8 to §63.1103(f) upon initial startup or **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, whichever is later.

5. Section 63.1103 is amended by:

a. Revising paragraph (f)(3)(i) and adding paragraphs (f)(3)(iii) through (v).

b. Adding entries (b) and (c) to table 8 to §63.1103(f).

c. Adding paragraphs (f)(4) and (5).

d. Revising paragraph (g)(1)(ii).

e. Revising paragraph (g)(2) to add definition for "free cyanide" in alphabetical order.

f. Revising paragraph (g)(3).

g. Adding paragraph (g)(5)(vi).

h. Adding paragraph (g)(6).

i. Revising entry (f) in table 9 to §63.1103(g).

j. Redesignating entries (g), (h) and (i) to (h), (i) and (j) in table 9 to §63.1103(g).

k. Adding entry (g) to table 9 to §63.1103(g).

l. Revising redesignated entry (j).

The additions and revisions read as follows:

§63.1103 Source category-specific applicability, definitions, and requirements.

* * * * *

(f) * * *

(3) * * *

(i) Table 8 to this section specifies the carbon black production standards applicability for existing and new sources. Applicability assessment procedures and methods are specified in §63.1104. An owner or operator of an affected source is not required to perform applicability tests or other applicability assessment procedures if they opt to comply with the most stringent requirements for an applicable emission point pursuant to this subpart. General compliance, recordkeeping, and reporting requirements are specified in §§63.1108 through 63.1112. Before **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, minimization of emissions from startup, shutdown, and malfunctions must be addressed in the startup, shutdown, and malfunction plan required by §63.1111; the plan must also establish reporting and recordkeeping of such events. A startup, shutdown, and malfunction plan is not required on and after **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** and the requirements specified in §63.1111 no longer apply; however, for historical compliance purposes, a copy of

the plan must be retained and available on-site for 5 years after **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Procedures for approval of alternative means of emission limitations are specified in §63.1113.

* * * * *

(iii) *Boiler and Process Heater Tune Up Requirements.* The requirements of paragraphs (f)(3)(iii)(A) through (F) of this section apply beginning no later than the compliance dates specified in §63.1102(e) for carbon black production affected sources and as specified in Table 8 to §63.1103(f), line entry (c).

(A) Inspect the combustion device for damage, wear, and buildup of material that could impact effectiveness, and clean or replace any components of the burner as necessary. Units that produce electricity for sale may delay the combustion device inspection until the first outage after the annual inspection is required, not to exceed 36 months from the previous inspection. At units where entry into a piece of process equipment or into a storage vessel is required to complete the tune-up inspections, inspections are required only during planned entries into the storage vessel or process equipment;

(B) When possible based upon the configuration of the burner, inspect the flame pattern and adjust the burner if needed to optimize the flame pattern. If manufacturer's specifications for an optimized flame pattern are available, the adjustment should be consistent with the manufacturer's specifications;

(C) Inspect the system controlling the air-to-fuel ratio, and ensure that it is functioning properly. For any calibrated components ensure that it is correctly calibrated The annual inspection may be delayed until the next scheduled unit shutdown. Units that produce electricity

for sale may delay the inspection until the first outage after the annual inspection is required, not to exceed 36 months from the previous inspection;

(D) Optimize total emissions of CO. If manufacturer's specifications for optimization are available, this optimization should be consistent with the manufacturer's specifications and with any NO_X requirement to which the unit is subject. If no manufacturer's specifications are available, the inspection and cleaning procedures of paragraph (f)(3)(iii)(A) fulfill the obligations of this paragraph;

(E) Measure the concentrations in the effluent stream of CO in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made. Measurements may be taken using a portable CO analyzer and may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made. If adjustments are not or cannot be made, make the measurements before and after the inspection and cleaning procedures specified in paragraph (f)(3)(iii)(A); and

(F) Maintain on-site and submit, if requested by the Administrator, a report containing the information in paragraphs (f)(3)(iii)(F)(*1*) through (*3*) of this section,

(*1*) The concentrations of CO in the effluent stream in parts per million by volume, and oxygen in volume percent, measured at high fire or typical operating load, before and after the tune-up of the boiler or process heater;

(*2*) A description of any corrective actions taken as a part of the tune-up; and

(*3*) The type and amount of fuel used over the 12 months prior to the tune-up, but only if the unit was physically and legally capable of using more than one type of fuel during that period. Units sharing a fuel meter may estimate the fuel used by each unit.

(iv) *Process vent applicability determination*. When determining the applicability of the carbon black production process vent requirements specified in line entry (b) to Table 8 to §63.1103(f), an owner or operator is required to determine the HAP concentration of the process vent streams, at a minimum, as specified in paragraphs (f)(3)(iv)(A) through (D) of this section.

(A) As an alternative to testing all carbon black production process carbon black or product vent streams after the main unit filter to determine applicability, an owner or operator has the option of testing the first carbon black production process or product vent stream after the main unit filter. If the concentration of the emission stream is less than 260 parts per million by volume as determined by the process vent applicability determination requirements specified in §63.1103(f)(3)(iv), then all process vents after the main unit filter and before the dryer are deemed to be in compliance and are not subject to the emission limits in Table 8 below.

(B) As an alternative to testing all carbon black production process carbon black or product vent streams after the dryer to determine applicability, an owner or operator has the option of testing the first carbon black production process carbon black or product vent stream after the dryer. If the concentration of the emission stream is less than 260 parts per million by volume as determined by the process vent applicability determination requirements specified in §63.1103(f)(3)(iv), then all process vents after the dryer are deemed to be in compliance and are not subject to the emission limits in Table 8 below.

(C) Report the results of the applicability assessment according to paragraph §63.1110(a)(10)(i).

(D) A test meeting the requirements of §63.1104(e) conducted after **[INSERT DATE 60 MONTHS BEFORE DATE OF PUBLICATION IN THE FEDERAL REGISTER]** and where no process changes have occurred since the test that may affect emissions, may be

submitted according to §63.1110(a)(10)(i)(A) through (C) in lieu of performing a new applicability determination.

(v) *Main unit filter process vent applicability determination*. When determining the applicability of the carbon black production main unit filter process vent requirements specified in line entry (a) to Table 8 to §63.1103(f), an owner or operator is required to determine the HAP concentration of the main unit filter process vent streams. Beginning **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, report the results of any applicability assessment conducted after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the applicability assessment according to paragraph §63.1110(a)(10)(i).

TABLE 8 TO §63.1103(f)—WHAT ARE MY REQUIREMENTS IF I OWN OR OPERATE A CARBON BLACK PRODUCTION EXISTING OR NEW AFFECTED SOURCE?

If you own or operate . . .	And if . . .	Then you must . . .
* * *	* * *	* * *
(b) A carbon black production process vent not subject to line entry (a) of this table	(1) The HAP concentration of the emission stream is equal to or greater than 260 parts per million by volume[a] as determined by the process vent applicability determination requirements specified in §63.1103(f)(3)(iv).	Beginning no later than the compliance dates specified in §63.1102(e): (i) Reduce emissions of HAP by using a flare meeting the requirements of subpart SS of this part; or (ii) Reduce emissions of total HAP by 98 weight-percent or to a concentration of 20 parts per million by volume, whichever is less stringent, by venting emissions through a closed vent system to any combination of control devices meeting the requirements of §63.982(a)(2).
(c) A carbon black production process vent subject to (a) or (b) above	(1) The process vent complies by routing emissions to a boiler/process heater for use as fuel gas	(i) Beginning no later than the compliance dates specified in §63.1102(e), conduct annual tune up requirements as specified in §63.1103(f)(3)(iii) of this subpart.

[a] The weight-percent organic HAP is determined according to the procedures specified in §63.1104(e).

* * * * *

(4) Beginning no later than the compliance dates specified in §63.1102(e), the referenced provisions specified in paragraphs (f)(4)(i) through (xiii) of this section do not apply when demonstrating compliance with paragraph (f)(3) of this section.

(i) The phrase "except during periods of start-up, shutdown and malfunction as specified in the referencing subpart" in §63.984(a) of subpart SS (equipment and operating requirements for fuel gas systems and processes requirements).

(ii) The phrase "except during periods of start-up, shutdown and malfunction as specified in the referencing subpart" in §63.985(a) of subpart SS (nonflare control device equipment and operating requirements).

(iii) The phrase "other than start-ups, shutdowns, or malfunctions" in §63.994(c)(1)(ii)(D) of subpart SS (halogen scrubber and other halogen reduction device monitoring requirements).

(iv) Section 63.996(c)(2)(ii) of subpart SS (operation and maintenance of continuous parameter monitoring systems) "(ii) If under the referencing subpart, an owner or operator has developed a start-up, shutdown, and malfunction plan, the plan is followed, and the CPMS is repaired immediately, this action shall be recorded as specified in §63.998(c)(1)(ii)(E)."

(v) The last sentence of §63.997(e)(1)(i) (performance test procedures) of subpart SS (general procedures for continuous unit operations): "Operations during periods of start-up, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test."

(vi) Section 63.998(b)(2)(iii) (excluded data) of subpart SS: "(iii) Startups, shutdowns, and malfunctions, if the owner or operator operates the source during such periods in accordance with §63.1111(a) and maintains the records specified in paragraph (d)(3) of this section."

(vii) The phrase "other than periods of startups, shutdowns, and malfunctions" from §63.998(b)(5)(i)(A) (alternative recordkeeping) of subpart SS.

(viii) The phrase "other than a start-up, shutdown, or malfunction" from §63.998(b)(5)(i)(B)(3) (alternate recordkeeping) of subpart SS.

(ix) The phrase "other than periods of startups, shutdowns, and malfunctions" from §63.998(b)(5)(i)(C) (alternate recordkeeping) of subpart SS.

(x) The phrase "other than a start-up, shutdown, or malfunction" from §63.998(b)(5)(ii)(C) (alternate recordkeeping) of subpart SS.

(xi) The phrase "except as provided in paragraphs (b)(6)(i)(A) and (B) of this section" from §63.998(b)(6)(i) (alternative recordkeeping) of subpart SS.

(xii) The second sentence of §63.998(b)(6)(ii) (alternative recordkeeping) of subpart SS. "If a source has developed a startup, shutdown and malfunction plan, and a monitored parameter is outside its established range or monitoring data are not collected during periods of start-up, shutdown, or malfunction (and the source is operated during such periods in accordance with §63.1111(a)) or during periods of nonoperation of the process unit or portion thereof (resulting in cessation of the emissions to which monitoring applies), then the excursion is not a violation and, in cases where continuous monitoring is required, the excursion does not count as the excused excursion for determining compliance."

(xiii) Section 63.998(c)(1)(ii)(D) through (G) (nonflare control and recovery device regulated source monitoring records) of subpart SS.

(xiv) Section 63.998(d)(3) (regulated source and control equipment start-up, shutdown, and malfunction records) of subpart SS.

(5) Beginning no later than the compliance dates specified in §63.1102(e), the provisions specified in §63.983(a)(1) of subpart SS that each closed vent system shall be designed and operated to collect the regulated material vapors from the emission point shall apply at all times, with the following exception: The closed vent system to the control device may be bypassed during startup or shutdown of a reactor when the excess oxygen concentration in the closed vent system is greater than or equal to 3 percent. Startup and shutdown of a reactor must be completed as expeditiously as possible, and in fewer than 15 minutes whenever possible. In no case shall the time period allowed be permitted to exceed 15 minutes. The bypass of the control device must use one of the methods specified in paragraphs (f)(5)(i) through (ii):

(i) *Calculated Purge Duration Method*: Each facility must calculate the purge duration of their closed vent system by evaluating the volume of the closed vent system and the flowrate of the contents of the closed vent system from the reactor to the common tail gas header. Additionally, each facility must calculate the amount of time it takes to open and/or close the common tail gas header and open and/or close the main unit filter vent to maintain constant pressure. The time required to completely purge the closed vent system is added to the time required to open and close the associated vents along with a safety factor that accounts for the physical and technological constraints of the facility, to determine the total calculated purge duration in minutes.

(ii) *Oxygen Sensors*: Facilities may use oxygen sensors located within the closed vent system to determine when the oxygen level falls below 3 percent.

* * * * *

(g) * * *

(1) * * *

(ii) *Compliance schedule*. The compliance schedule for the affected source, as defined in paragraph (g)(1)(i) of this section, is specified in §63.1102.

(2) * * *

Free cyanide means chemical species of cyanide that are dissolved in water and are bioavailable and known for their toxic effects on living organisms. This refers to the sum of molecular hydrogen cyanide (HCN) and cyanide ion (CN^-) dissolved in water. Included in this definition are the dissolved products of cyanide salts (including potassium cyanide [KCN] and sodium cyanide [NaCN]), as these salts dissociate to cyanide ion and hydrogen cyanide when added to water.

* * * * *

(3) *Requirements.* Table 9 to this section specifies the cyanide chemicals manufacturing standards applicable to existing and new sources. Applicability assessment procedures and methods are specified in §63.1104. An owner or operator of an affected source is not required to perform applicability tests or other applicability assessment procedures if they opt to comply with the most stringent requirements for an applicable emission point pursuant to this subpart. General compliance, recordkeeping, and reporting requirements are specified in §§63.1108 through 63.1112. Before **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, minimization of emissions from startup, shutdown, and malfunctions must be addressed in the startup, shutdown, and malfunction plan required by §63.1111; the plan must also establish reporting and recordkeeping of such events. A startup, shutdown, and malfunction plan is not required on and after **[INSERT DATE 180 DAYS**

AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] and the requirements specified in §63.1111 no longer apply; however, for historical compliance purposes, a copy of the plan must be retained and available on-site for 5 years after **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Procedures for approval of alternative means of emission limitations are specified in §63.1113.

* * * * *

(5) * * *

(vi) For compliance with the wastewater free cyanide analysis provisions of table 9 to §63.1103(g), free cyanide is to be measured according to ASTM D4282-15 or ASTM D7237-18 (both incorporated by reference, see § 63.14).

(6) *Startup, shutdown, and malfunction referenced provisions.* Beginning no later than the compliance dates specified in §63.1102(d), the referenced provisions specified in paragraphs (g)(6)(i) through (xxiii) of this section do not apply when demonstrating compliance with paragraph (g)(3) of this section.

(i) The second/last sentence of §63.983(a)(5) (requirements for pressure relief devices in a transfer rack's closed vent system requirements) of subpart SS: "Pressure relief devices needed for safety purposes are not subject to this paragraph."

(ii) The phrase "except during periods of start-up, shutdown and malfunction as specified in the referencing subpart" in §63.984(a) of subpart SS (equipment and operating requirements for fuel gas systems and processes requirements).

(iii) The phrase "except during periods of start-up, shutdown and malfunction as specified in the referencing subpart" in §63.985(a) of subpart SS (nonflare control device equipment and operating requirements).

(iv) The phrase "other than start-ups, shutdowns, or malfunctions" in §63.994(c)(1)(ii)(D) of subpart SS (halogen scrubber and other halogen reduction device monitoring requirements).

(v) Section 63.996(c)(2)(ii) of subpart SS (operation and maintenance of continuous parameter monitoring systems) "(ii) If under the referencing subpart, an owner or operator has developed a start-up, shutdown, and malfunction plan, the plan is followed, and the CPMS is repaired immediately, this action shall be recorded as specified in §63.998(c)(1)(ii)(E)."

(vi) The last sentence of §63.997(e)(1)(i) (performance test procedures) of subpart SS (general procedures for continuous unit operations): "Operations during periods of start-up, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test."

(vii) Section 63.998(b)(2)(iii) (excluded data) of subpart SS: "(iii) Startups, shutdowns, and malfunctions, if the owner or operator operates the source during such periods in accordance with §63.1111(a) and maintains the records specified in paragraph (d)(3) of this section."

(viii) The phrase "other than periods of startups, shutdowns, and malfunctions" from §63.998(b)(5)(i)(A) (alternative recordkeeping) of subpart SS.

(ix) The phrase "other than a start-up, shutdown, or malfunction" from §63.998(b)(5)(i)(B)(3) (alternate recordkeeping) of subpart SS.

(x) The phrase "other than periods of startups, shutdowns, and malfunctions" from §63.998(b)(5)(i)(C) (alternate recordkeeping) of subpart SS.

(xi) The phrase "other than a start-up, shutdown, or malfunction" from §63.998(b)(5)(ii)(C) (alternate recordkeeping) of subpart SS.

(xii) The phrase "except as provided in paragraphs (b)(6)(i)(A) and (B) of this section" from §63.998(b)(6)(i) (alternative recordkeeping) of subpart SS.

(xiii) The second sentence of §63.998(b)(6)(ii) (alternative recordkeeping) of subpart SS. "If a source has developed a startup, shutdown and malfunction plan, and a monitored parameter is outside its established range or monitoring data are not collected during periods of startup, shutdown, or malfunction (and the source is operated during such periods in accordance with §63.1111(a)) or during periods of nonoperation of the process unit or portion thereof (resulting in cessation of the emissions to which monitoring applies), then the excursion is not a violation and, in cases where continuous monitoring is required, the excursion does not count as the excused excursion for determining compliance."

(xiv) Section 63.998(c)(1)(ii)(D) through (G) (nonflare control and recovery device regulated source monitoring records) of subpart SS.

(xv) Section 63.998(d)(3) (regulated source and control equipment start-up, shutdown and malfunction records) of subpart SS.

(xvi) The phrase "may be included as part of the startup, shutdown, and malfunction plan, as required by the referencing subpart for the source, or" from §63.1005(e)(4)(i) (leak repair records written procedures) of subpart TT.

(xvii) The phrase "(except periods of startup, shutdown, or malfunction)" from §63.1007(e)(1)(ii)(A) (dual mechanical seal system special provisions for pumps) of subpart TT.

(xviii) The phrase "(except periods of startup, shutdown, or malfunction)" from §63.1009(e)(1)(i)(A) (dual mechanical seal system special provisions for agitators) of subpart TT.

(xix) The phrase "(except periods of startup, shutdown, or malfunction)" from §63.1012(b)(1) (compressor seal system standard) of subpart TT.

(xx) The phrase "may be included as part of the startup, shutdown, and malfunction plan, as required by the referencing subpart for the source, or" from §63.1024(f)(4)(i) (leak repair records written procedures) of subpart UU.

(xxi) The phrase "(except periods of startup, shutdown, or malfunction)" from §63.1026(e)(1)(ii)(A) (dual mechanical seal system special provisions for pumps) of subpart UU.

(xxii) The phrase "(except periods of startup, shutdown, or malfunction)" from §63.1028(e)(1)(i)(A) (dual mechanical seal system special provisions for agitators of subpart UU.

(xxiii) The phrase "(except periods of startup, shutdown, or malfunction)" from §63.1031(b)(1) (compressor seal system standard) of subpart UU.

TABLE 9 TO §63.1103(g)—WHAT ARE MY REQUIREMENTS IF I OWN OR OPERATE A CYANIDE CHEMICALS MANUFACTURING EXISTING OR NEW AFFECTED SOURCE?

If you own or operate . . .	And if . . .	Then you must . . .
* *	* * *	* *
(f) A new cyanide chemicals manufacturing process unit that generates process wastewater	(1) The process wastewater is from HCN purification, ammonia purification, or flare blowdown	(i) Achieve a combined removal and control of HAP from wastewater of 93 weight-percent; and (ii) Beginning no later than the compliance dates specified in §63.1102(d), waste management units upstream of an open or closed biological treatment process shall meet the requirements of §63.133 through §63.137 of subpart G of this part, as applicable.
(g) An existing cyanide chemicals manufacturing process	(1) The process wastewater stream is from HCN purification, ammonia purification, or flare blowdown; and	(i) Beginning no later than the compliance dates specified in §63.1102(d), comply with the requirements of §63.138(a)(1).

unit that generates process wastewater	(2) the total annual average concentration of Table 9 of 40 CFR part 63, subpart G compounds (Table 9 compounds) and free cyanide measured according to §63.1103(g)(5)(vi) from each process wastewater stream are greater or equal to 10,000 ppmw at any flow rate, or the total annual average concentration of Table 9 compounds and free cyanide from each process wastewater stream are greater or equal to 1,000 ppmw, and the annual average flow rate is greater or equal to 10 liters per minute, according to the procedures in §63.144(a)	(ii) For compliance options and calculations requiring an Fr value under §63.138(a)(1); owners and operators may use a value of 0.93 for free cyanide.
(h) A cyanide chemicals manufacturing process unit that generates maintenance wastewater	(1) The maintenance wastewater contains hydrogen cyanide or acetonitrile	(i) Comply with the requirements of §63.1106(b).
(i) An item of equipment listed in §63.1106(c)(1) that transports or contains wastewater liquid streams from a cyanide chemicals manufacturing process unit	(1) The item of equipment meets the criteria specified in §63.1106(c)(1) through (3) and either (c)(4)(i) or (ii)	(i) Comply with the requirements in Table 35 of subpart G of this part.
(j) Equipment, as defined under §63.1101	(1) The equipment contains or contacts hydrogen cyanide and operates equal to or greater than 300 hours per year	(i) Comply with either subpart TT or UU of this part, and paragraph (g)(5) of this section, with the exception that open-ended lines that contain or contact hydrogen cyanide are exempt from any requirements to install a cap, plug, blind flange, or second valve to be capped.

6. Section 63.1104 is amended by revising paragraph (c) to read as follows:

§63.1104 Process vents from continuous unit operations: applicability assessment procedures and methods.

* * * * *

(c) *Applicability assessment requirements.* The TOC or organic HAP concentrations, process vent volumetric flow rates, process vent heating values, process vent TOC or organic HAP emission rates, halogenated process vent determinations, process vent TRE index values, and engineering assessments for process vent control applicability assessment requirements are to be determined during maximum representative operating conditions for the process, except as provided in paragraph (d) of this section, or unless the Administrator specifies or approves alternate operating conditions. For acrylic and modacrylic fiber production affected sources, carbon black production affected sources, cyanide chemicals manufacturing affected sources, polycarbonate production affected sources, and ethylene production affected sources, operations during periods of malfunction shall not constitute representative conditions for the purpose of an applicability test. For all other affected sources, operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of an applicability test.

* * * * *

7. Section 63.1108 is amended by:

a. Revising paragraphs (a) introductory text and paragraph (a)(4)(i).

b. Revising paragraphs (b)(1)(ii), (b)(2) introductory text, and paragraphs (b)(4)(ii)(A) and (B).

The revisions read as follows:

§63.1108 Compliance with standards and operation and maintenance requirements.

(a) *Requirements.* The requirements of paragraphs (a)(1), (2), and (5) of this section apply to all affected sources except acrylic and modacrylic fiber production affected sources and polycarbonate production affected sources, and beginning no later than the compliance dates specified in §63.1102(c) for ethylene production affected sources, specified in §63.1102(d) for cyanide chemicals manufacturing affected sources, and specified in §63.1102(e) for carbon black production affected sources. The requirements of paragraph (a)(4) of this section apply only to acrylic and modacrylic fiber production affected sources, polycarbonate production affected sources and beginning no later than the compliance dates specified in §63.1102(c) for ethylene production affected sources, specified in §63.1102(d) for cyanide chemicals manufacturing affected sources, and specified in §63.1102(e) for carbon black production affected sources. The requirements of paragraphs (a)(3), (6), and (7) of this section apply to all affected sources.

* * * * *

(4) * * *

(i) For acrylic and modacrylic fiber production affected sources and polycarbonate production affected sources, and beginning no later than the compliance dates specified in §63.1102(c) for ethylene production affected sources, specified in §63.1102(d) for cyanide chemicals manufacturing, and specified in §63.1102(e) for carbon black production affected sources, the emission limitations and established parameter ranges of this part shall apply at all times except during periods of non-operation of the affected source (or specific portion thereof) resulting in cessation of the emissions to which this subpart applies. Equipment leak requirements shall apply at all times except during periods of non-operation of the affected source (or specific portion thereof) in which the lines are drained and depressurized resulting in cessation of the emissions to which the equipment leak requirements apply.

* * * * *

(b) * * *

(1) * * *

(ii) Excused excursions are not allowed for acrylic and modacrylic fiber production affected sources, polycarbonate production affected sources, and beginning no later than the compliance dates specified in §63.1102(c) for ethylene production affected sources, specified in §63.1102(d) for cyanide chemicals manufacturing affected sources, and specified in §63.1102(e) for carbon black production affected sources. For all other affected sources, including ethylene production, cyanide chemicals manufacturing, and carbon black production affected sources, prior to the compliance dates specified in §63.1102(c) through (e), an excused excursion, as described in §63.998(b)(6)(ii), is not a violation.

(2) *Parameter monitoring: Excursions.* An excursion is not a violation in cases where continuous monitoring is required and the excursion does not count toward the number of excused excursions (as described in §63.998(b)(6)(ii)), if the conditions of paragraph (b)(2)(i) or (ii) of this section are met, except that the conditions of paragraph (b)(2)(i) of this section do not apply for acrylic and modacrylic fiber production affected sources, polycarbonate production affected sources, and beginning no later than the compliance dates specified in §63.1102(c) for ethylene production affected sources, specified in §63.1102(d) for cyanide chemicals manufacturing affected sources, and specified in §63.1102(e) for carbon black production affected sources. Nothing in this paragraph shall be construed to allow or excuse a monitoring parameter excursion caused by any activity that violates other applicable provisions of this subpart or a subpart referenced by this subpart.

* * * * *

(4) * * *

(ii) * * *

(A) The Administrator may determine compliance with emission limitations of this subpart based on, but not limited to, the results of performance tests conducted according to the procedures specified in §63.997, unless otherwise specified in this subpart or a subpart referenced by this subpart. For carbon black production affected sources, beginning no later than the compliance dates specified in §63.1102(e), in addition to initial performance test requirements to demonstrate compliance with process vent requirements, subsequent performance tests are required no later than 60 months after the preceding performance test in accordance with the procedures specified in §63.997(e) for initial performance tests.

(B) For acrylic and modacrylic fiber production affected sources, polycarbonate production affected sources, and beginning no later than the compliance dates specified in §63.1102(c) for ethylene production affected sources, specified in §63.1102(d) for cyanide chemicals manufacturing affected sources, and specified in §63.1102(e) for carbon black production affected sources, 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. Representative conditions exclude periods of startup and shutdown unless specified by the Administrator or an applicable subpart. The owner or operator may not conduct performance tests during periods of malfunction. The owner or operator must record the process information that is necessary to document operating conditions during the test and include in such record an explanation to support that such conditions represent normal operation. 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.

* * * * *

8. Section 63.1110 is amended by:

a. Revising paragraph (a) introductory text.

b. Revising paragraphs (a)(7), (a)(10)(i) introductory text, (a)(10)(i)(A) through (C), and (a)(10)(ii).

c. Revising paragraph (d)(2).

The revisions read as follows:

§63.1110 Reporting requirements.

(a) *Required reports.* Each owner or operator of an affected source subject to this subpart shall submit the reports listed in paragraphs (a)(1) through (8) of this section, as applicable. Each owner or operator of an acrylic and modacrylic fiber production affected source or polycarbonate production affected source subject to this subpart shall also submit the reports listed in paragraph (a)(9) of this section in addition to the reports listed in paragraphs (a)(1) through (8) of this section, as applicable. Beginning no later than the compliance dates specified in §63.1102(c) for ethylene production affected sources, specified in §63.1102(d) for cyanide chemicals manufacturing affected sources, and specified in §63.1102(e) for carbon black production affected sources, each owner or operator of an ethylene production affected source, cyanide chemicals manufacturing affected source, and carbon black production affected source subject to this subpart shall also submit the reports listed in paragraph (a)(10) of this section in addition to the reports listed in paragraphs (a)(1) through (8) of this section, as applicable.

* * * * *

(7) Startup, Shutdown, and Malfunction Reports described in §63.1111 (except for acrylic and modacrylic fiber production affected sources, carbon black production affected sources, cyanide chemicals manufacturing affected sources, ethylene production affected sources, and polycarbonate production affected sources).

* * * * *

(10) * * *

(i) Beginning no later than the compliance dates specified in §63.1102(c) for ethylene production affected sources, specified in §63.1102(d) for cyanide chemicals manufacturing affected sources, and specified in §63.1102(e) for carbon black production affected sources, within 60 days after the date of completing each performance test required by this subpart or applicability assessment required by §63.1103(f)(3)(iv), the owner or operator must submit the results of the performance test or applicability assessment following the procedures specified in paragraphs (a)(10)(i)(A) through (C) of this section.

(A) *Data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT website (https://www.epa.gov/electronic-reporting-air-emissions/electronic-reporting-tool-ert) at the time of the test.* Submit the results of the performance test or applicability assessment to the EPA via CEDRI, which can be accessed through the EPA's CDX (*https://cdx.epa.gov/*). The data must be submitted in a file format generated through the use of the EPA's ERT. Alternatively, you may submit an electronic file consistent with the extensible markup language (XML) schema listed on the EPA's ERT website.

(B) *Data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT website at the time of the test.* The results of the performance test or applicability assessment must be included as an attachment in the ERT or an alternate electronic

file consistent with the XML schema listed on the EPA's ERT website. Submit the ERT generated package or alternative file to the EPA via CEDRI.

(C) *CBI.* Do not use CEDRI to submit information you claim as CBI. Anything submitted to CEDRI cannot later be claimed CBI. Although we do not expect persons to assert a claim of CBI, if an owner or operator wishes to assert a CBI claim for some of the information submitted under paragraph (a)(10)(i)(A) or (B) of this section, then the owner or operator must submit a complete file, including information claimed to be CBI, to the EPA. The file must be generated through the use of the EPA's ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT website. Submit the file on a compact disc, flash drive, or other commonly used electronic storage medium and clearly mark the medium as CBI. Mail the electronic medium to U.S. EPA/OAQPS/CORE CBI Office, Attention: Group Leader, Measurement Policy Group, MD C404-02, 4930 Old Page Rd., Durham, NC 27703. The same file with the CBI omitted must be submitted to the EPA via EPA's CDX as described in paragraphs (a)(10)(i)(A) and (B) of this section. All CBI claims must be asserted at the time of submission. Furthermore, under CAA section 114(c), emissions data is not entitled to confidential treatment, and the EPA is required to make emissions data available to the public. Thus, emissions data will not be protected as CBI and will be made publicly available.

(ii) Beginning no later than the compliance dates specified in §63.1102(c) through (e), the owner or operator must submit all subsequent Notification of Compliance Status reports required under paragraph (a)(4) of this section in PDF format to the EPA via CEDRI, which can be accessed through EPA's CDX (*https://cdx.epa.gov/*). All subsequent Periodic Reports required under paragraph (a)(5) of this section must be submitted to the EPA via CEDRI using the appropriate electronic report template on the CEDRI website (*https://www.epa.gov/electronic-*

reporting-air-emissions/compliance-and-emissions-data-reporting-interface-cedri) for this subpart beginning no later than the compliance dates specified in §63.1102(c) through (e) or once the report template has been available on the CEDRI website for 1 year, whichever date is later. The date report templates become available will be listed on the CEDRI website. The report must be submitted by the deadline specified in this subpart, regardless of the method in which the report is submitted. Although we do not expect persons to assert a claim of CBI, if you wish to assert a CBI claim, then submit a complete report, including information claimed to be CBI, to the EPA. Periodic Reports must be generated using the appropriate template on the CEDRI website. Submit the file on a compact disc, flash drive, or other commonly used electronic storage medium and clearly mark the medium as CBI. Mail the electronic medium to U.S. EPA/OAQPS/CORE CBI Office, MD C404-02, 4930 Old Page Road, Durham NC 27703 to the attention of the applicable person specified in paragraphs (A) through (C) of this section. The same file with the CBI omitted must be submitted to the EPA via the EPA's CDX as described earlier in this paragraph. All CBI claims must be asserted at the time of submission. Furthermore, under CAA section 114(c), emissions data is not entitled to confidential treatment, and the EPA is required to make emissions data available to the public. Thus, emissions data will not be protected as CBI and will be made publicly available.

(A) Ethylene Production Sector Lead

(B) Cyanide Chemicals Manufacturing Sector Lead

(C) Carbon Black Production Sector Lead

* * * * *

(d) * * *

(2) *Due date.* The owner or operator shall submit the Notification of Compliance Status for each affected source 240 days after the compliance date specified for the affected source under this subpart, or 60 days after completion of the initial performance test or initial compliance assessment/subsequent required performance test or subsequent compliance assessment, whichever is earlier. Notification of Compliance Status reports may be combined for multiple affected sources as long as the due date requirements for all sources covered in the combined report are met.

* * * * *

9. Section 63.1111 is amended by revising paragraphs (a) introductory text, (b) introductory text, and (c) introductory text to read as follows:

§63.1111 Startup, shutdown, and malfunction.

(a) *Startup, shutdown, and malfunction plan.* Before **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the requirements of this paragraph (a) apply to all affected sources except for acrylic and modacrylic fiber production affected sources and polycarbonate production affected sources. On and after **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the requirements of this paragraph (a) apply to all affected sources except for acrylic and modacrylic fiber production affected sources, carbon black production affected sources, cyanide chemicals manufacturing affected sources, and polycarbonate production affected sources. On and after July 6, 2023, the requirements of this paragraph (a) apply to all affected sources except for acrylic and modacrylic fiber production affected sources, carbon black production affected sources, cyanide chemicals manufacturing affected sources, ethylene production affected sources, and polycarbonate production affected sources.

* * * * *

(b) *Startup, shutdown, and malfunction reporting requirements.* Before **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the requirements of this paragraph (b) apply to all affected sources except for acrylic and modacrylic fiber production affected sources and polycarbonate production affected sources. On and after **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the requirements of this paragraph (b) apply to all affected sources except for acrylic and modacrylic fiber production affected sources, carbon black production affected sources, cyanide chemicals manufacturing affected sources, and polycarbonate production affected sources. On and after July 6, 2023, the requirements of this paragraph (b) apply to all affected sources except for acrylic and modacrylic fiber production affected sources, carbon black production affected sources, cyanide chemicals manufacturing affected sources, ethylene production affected sources, and polycarbonate production affected sources.

* * * * *

(c) *Malfunction recordkeeping and reporting.* Before **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the requirements of this paragraph (c) apply only to acrylic and modacrylic fiber production affected sources and polycarbonate production affected sources. On and after **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the requirements of this paragraph (c) apply only to acrylic and modacrylic fiber production affected sources, carbon black production affected sources, cyanide chemicals manufacturing affected sources, and polycarbonate production affected sources. On and after July 6, 2023, the requirements of this paragraph (c) apply only to acrylic and modacrylic fiber production affected sources, carbon

black production affected sources, cyanide chemicals manufacturing affected sources, ethylene production affected sources, and polycarbonate production affected sources.

* * * * *

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 10/29/2021 11:57:53 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Goffman, Joseph [Goffman.Joseph@epa.gov]
Subject: FOR YOUR REVIEW: Oil and Gas Signature Package
Attachments: OGC Concurrence.pdf; ONG Climate Review Proposal_Post-It Note .docx; SAN 8510 Oil Gas typesetting request.pdf; SAN 8510 ONG Climate Review Proposal RIA 2021.10.29.docx; SAN 8510 ONG Climate Review Proposal TSD 2021.10.29.docx; ONG Climate Review NPRM Action Memo_Letterhead.docx; SAN 8510 ONG Climate Review Proposal FRN 2021.10.29.docx

Tomas, the attached is ready for your review.

Ann (Campbell) Ferrio
Chief of Staff
Office of Air and Radiation
(202) 566-1370

Begin forwarded message:

From: "Iglesias, Amber" <Iglesias.Amber@epa.gov>
Date: October 29, 2021 at 7:49:49 PM EDT
To: "Campbell, Ann" <Campbell.Ann@epa.gov>
Cc: "Culligan, Kevin" <Culligan.Kevin@epa.gov>, "Noonan, Jenny" <Noonan.Jenny@epa.gov>, "Chang, Alice" <Chang.Alice@epa.gov>, "Mcquilkin, Wendy" <Mcquilkin.Wendy@epa.gov>, "Lubetsky, Jonathan" <Lubetsky.Jonathan@epa.gov>, "Davis, Alison" <Davis.Alison@epa.gov>
Subject: SAN 8510 Oil and Gas Signature Package

Ann,

Attached is the signature package for the Proposed Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review (SAN 8510). The CMS number for this package is OAR-21-000-6234 and the files will be uploaded to CMS Monday morning. The clearance materials for OMB were uploaded to ROCIS this evening. Please contact me with any questions regarding this package. Have a great weekend!

Amber Iglesias
Office of Air Quality Planning and Standards
1200 Pennsylvania Avenue N.W.
Washington, DC 20004
202-564-3175

6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 63

[EPA-HQ-OAR-2021–0016; FRL-8339-01-OAR]

RIN 2060-AV34

National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources Technology Review

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The U.S. Environmental Protection Agency (EPA) is proposing the results of the technology review conducted in accordance with the Clean Air Act (CAA) for the National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources and proposing amendments to the NESHAP. The EPA is proposing no changes to the standards as a result of the technology review. The EPA is proposing to amend provisions regarding electronic reporting; make miscellaneous clarifying and technical corrections; simplify the petition for exemption process; and clarify requirements addressing emissions during periods of startup, shutdown, and malfunction (SSM).

DATES: Comments must be received on or before **[INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Under the Paperwork Reduction Act (PRA), comments on the information collection provisions are best assured of consideration if the Office of Management and Budget (OMB) receives a copy of your comments on or before

[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

Public hearing. If anyone contacts us requesting a public hearing on or before **[INSERT DATE 5 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, we will hold a virtual public hearing. See **SUPPLEMENTARY INFORMATION** for information on requesting and registering for a public hearing.

ADDRESSES: You may send comments, identified by Docket ID No. EPA-HQ-OAR-2021-0016 for 40 Code of Federal Regulations (CFR) part 63, subpart HHHHHH, Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources, by any of the following methods:

- Federal eRulemaking Portal: *https://www.regulations.gov/* (our preferred method). Follow the online instructions for submitting comments.
- Email: *a-and-r-docket@epa.gov*. Include Docket ID No. EPA-HQ-OAR-2021-0016 in the subject line of the message.
- Fax: (202) 566-9744. Attention Docket ID No. EPA-HQ-OAR-2021-0016.
- Mail: U.S. Environmental Protection Agency, EPA Docket Center, Docket ID No. EPA-HQ-OAR-2021-0016, Mail Code 28221T, 1200 Pennsylvania Avenue, NW, Washington, DC 20460.
- Hand/Courier Delivery: EPA Docket Center, WJC West Building, Room 3334, 1301 Constitution Avenue, NW, Washington, DC 20004. The Docket Center's hours of operation are 8:30 a.m. – 4:30 p.m., Monday – Friday (except Federal holidays).

Instructions: All submissions received must include the applicable Docket ID No. for this rulemaking. Comments received may be posted without change to *https://www.regulations.gov/*,

including any personal information provided. For detailed instructions on sending comments and additional information on the rulemaking process, see the **SUPPLEMENTARY INFORMATION** section of this document. Out of an abundance of caution for members of the public and our staff, the EPA Docket Center and Reading Room are open to the public by appointment only to reduce the risk of transmitting COVID-19. Our Docket Center staff also continues to provide remote customer service via email, phone, and webform. Hand deliveries and couriers may be received by scheduled appointment only. For further information on EPA Docket Center services and the current status, please visit us online at *https://www.epa.gov/dockets*.

FOR FURTHER INFORMATION CONTACT: For questions about this proposed action contact Mr. John Feather, Sector Policies and Programs Division (D243-04), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541-3052; fax number: (919) 541-4991; and email address: *feather.john@epa.gov*.

SUPPLEMENTARY INFORMATION:

Participation in virtual public hearing. Please note that because of current Centers for Disease Control and Prevention (CDC) recommendations, as well as state and local orders for social distancing to limit the spread of COVID-19, the EPA cannot hold in-person public meetings at this time.

To request a virtual public hearing, contact the public hearing team at (888) 372-8699 or by email at *SPPDpublichearing@epa.gov*. If requested, the virtual hearing will be held on **[INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The hearing will convene at 11:00 a.m. Eastern Time (ET) and will conclude at

9:00 p.m. ET. The EPA may close a session 15 minutes after the last pre-registered speaker has testified if there are no additional speakers. The EPA will announce further details at *https://www.epa.gov/stationary-sources-air-pollution/paint-stripping-and-miscellaneous-surface-coating-operations*.

If a public hearing is requested, the EPA will begin pre-registering speakers for the hearing upon publication of this document in the *Federal Register*. To register to speak at the virtual hearing, please use the online registration form available at *https://www.epa.gov/stationary-sources-air-pollution/paint-stripping-and-miscellaneous-surface-coating-operations* or contact the public hearing team at (888) 372-8699 or by email at *SPPDpublichearing@epa.gov*. The last day to pre-register to speak at the hearing will be **[INSERT DATE 12 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Prior to the hearing, the EPA will post a general agenda that will list pre-registered speakers in approximate order at: *https://www.epa.gov/stationary-sources-air-pollution/paint-stripping-and-miscellaneous-surface-coating-operations*.

The EPA will make every effort to follow the schedule as closely as possible on the day of the hearing; however, please plan for the hearings to run either ahead of schedule or behind schedule.

Each commenter will have 5 minutes to provide oral testimony. The EPA encourages commenters to provide the EPA with a copy of their oral testimony electronically (via email) by emailing it to *feather.john@epa.gov*. The EPA also recommends submitting the text of your oral testimony as written comments to the rulemaking docket.

The EPA may ask clarifying questions during the oral presentations but will not respond to the presentations at that time. Written statements and supporting information submitted during

the comment period will be considered with the same weight as oral testimony and supporting information presented at the public hearing.

Please note that any updates made to any aspect of the hearing will be posted online at *https://www.epa.gov/stationary-sources-air-pollution/paint-stripping-and-miscellaneous-surface-coating-operations*. While the EPA expects the hearing to go forward as set forth above, please monitor our website or contact the public hearing team at (888) 372-8699 or by email at *SPPDpublichearing@epa.gov* to determine if there are any updates. The EPA does not intend to publish a document in the *Federal Register* announcing updates.

If you require the services of a translator or special accommodation such as audio description, please pre-register for the hearing with the public hearing team and describe your needs by **[INSERT DATE 7 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The EPA may not be able to arrange accommodations without advanced notice.

Docket. The EPA has established a docket for this rulemaking: Docket ID No. EPA-HQ-OAR-2021-0016. All documents in the docket are listed in *https://www.regulations.gov*. Although listed, some information is not publicly available, *e.g.*, Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy. With the exception of such material, publicly available docket materials are available electronically in Regulations.gov.

Instructions. Direct your comments to Docket ID No. EPA-HQ-OAR-2021-0016. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *https://www.regulations.gov/*, including any personal information provided, unless the comment includes information claimed to be CBI or other

information whose disclosure is restricted by statute. Do not submit electronically any information that you consider to be CBI or other information whose disclosure is restricted by statute. This type of information should be submitted by mail as discussed below.

The EPA may publish any comment received to its public docket. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission *(i.e.,* on the Web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit *https://www.epa.gov/dockets/commenting-epa-dockets*.

The *https://www.regulations.gov/* website allows you to submit your comment anonymously, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through *https://www.regulations.gov/*, your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any digital storage media you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should not include special characters or any form of encryption and be free of any defects or viruses. For additional information about the EPA's public docket, visit the EPA Docket Center homepage at *https://www.epa.gov/dockets*.

Field Code Changed

Due to public health concerns related to COVID-19, the EPA Docket Center and Reading Room are open to the public by appointment only. Our Docket Center staff also continues to provide remote customer service via email, phone, and webform. Hand deliveries or couriers will be received by scheduled appointment only. For further information and updates on EPA Docket Center services, please visit us online at *https://www.epa.gov/dockets*.

The EPA continues to carefully and continuously monitor information from the CDC, local area health departments, and our Federal partners so that we can respond rapidly as conditions change regarding COVID-19.

Submitting CBI. Do not submit information containing CBI to the EPA through *https://www.regulations.gov/* or email. Clearly mark the part or all of the information that you claim to be CBI. For CBI information on any digital storage media that you mail to the EPA, mark the outside of the digital storage media as CBI and then identify electronically within the digital storage media the specific information that is claimed as CBI. In addition to one complete version of the comments that includes information claimed as CBI, you must submit a copy of the comments that does not contain the information claimed as CBI directly to the public docket through the procedures outlined in *Instructions* above. If you submit any digital storage media that does not contain CBI, mark the outside of the digital storage media clearly that it does not contain CBI. Information not marked as CBI will be included in the public docket and the EPA's electronic public docket without prior notice. Information marked as CBI will not be disclosed except in accordance with procedures set forth in 40 CFR part 2. Send or deliver information identified as CBI only to the following address: OAQPS Document Control Officer (C404-02), OAQPS, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711,

Attention Docket ID No. EPA-HQ-OAR-2021-0016. Note that written comments containing CBI and submitted by mail may be delayed and no hand deliveries will be accepted.

Preamble acronyms and abbreviations. Throughout this document wherever "we," "us," or "our" is used, it is intended to refer to the EPA. We use multiple acronyms and terms in this preamble. While this list may not be exhaustive, to ease the reading of this preamble and for reference purposes, the EPA defines the following terms and acronyms here:

ACA	American Coatings Association
BACT	best available control technology
CAA	Clean Air Act
CBI	Confidential Business Information
CDX	Central Data Exchange
CEDRI	Compliance and Emissions Data Reporting Interface
CFR	Code of Federal Regulations
ECHO	Enforcement and Compliance History Online
EPA	Environmental Protection Agency
ERT	Electronic Reporting Tool
GACT	generally available control technology
HAP	hazardous air pollutant(s)
HVLP	high volume, low pressure
kg	kilogram
km	kilometer
LAER	lowest achievable emission rate
MACT	maximum achievable control technology
MeCL	methylene chloride
NAICS	North American Industry Classification System
NESHAP	national emission standards for hazardous air pollutants
NSR	New Source Review
NTTAA	National Technology Transfer and Advancement Act
OAQPS	Office of Air Quality Planning and Standards
OMB	Office of Management and Budget
OSHA	Occupational Safety and Health Administration
PDF	portable document format
PRA	Paperwork Reduction Act

PTE	permanent total enclosure
RACT	reasonably available control technology
RBLC	RACT/BACT/LAER Clearinghouse
RFA	Regulatory Flexibility Act
RTO	regenerative thermal oxidizer
SSM	startup, shutdown, and malfunction
tpy	tons per year
UMRA	Unfunded Mandates Reform Act
VOC	volatile organic compounds

Organization of this document. The information in this preamble is organized as follows:

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I. General Information

A. Does this action apply to me?

Table 1 of this preamble lists the NESHAP and associated regulated industrial source categories that are the subject of this proposal. Table 1 is not intended to be exhaustive, but rather provides a guide for readers regarding the entities that this proposed action is likely to affect. The proposed amendments to 40 CFR part 63, subpart HHHHHH, once promulgated, will be directly applicable to the affected sources. These three area source categories, Paint Stripping, Miscellaneous Surface Coating, and Motor Vehicle and Mobile Equipment Surface Coating were listed as part of the Urban Air Toxics Strategy and include methylene chloride (MeCl)-containing paint stripping operations and certain surface coating operations located at area sources. The NESHAP's title of Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources refers to a single set of emission standards that addresses all three source categories. Paint stripping is often used as preparation for surface coating operations, so was included along with the other two source categories in this NESHAP but is treated separately within this NESHAP due to differences in practices and standards. The Miscellaneous Surface Coating and Motor Vehicle and Mobile Equipment Surface Coating source categories are subject to similar standards for the same HAP, so they are grouped together as "surface coating" operations for most purposes within this action. However, as explained in this section and section

II.B of this preamble, there are some differences in applicability and standards between the two source categories. An area source is defined in CAA section 112(a) as any stationary source of HAP that is not a major source, and a major source is defined as any stationary source or group of stationary sources located within a contiguous area and under common control that emits, or has the potential to emit, considering controls, in the aggregate, 10 tons per year (tpy) or more of any single HAP or 25 tpy or more of any combination of HAP. Paint stripping operations are those that perform paint stripping using MeCl for the removal of dried paint (including, but not limited to, paint, enamel, varnish, shellac, and lacquer) from wood, metal, plastic, and other substrates at area sources as either (1) an independent activity where paint stripping is the principal activity at the source or (2) an activity incidental to the principal activity (e.g., surface coating, inspection, maintenance, etc.) at the source. Co-located paint stripping activities that use one ton or less per year are considered to be incidental to the principal activity and those using more than one ton to be performing paint stripping as a principal activity. Motor vehicle and mobile equipment surface coating operations are those that spray apply coatings at area sources to automobiles, light trucks, heavy duty trucks, buses, construction equipment, self-propelled vehicles and equipment that may be drawn and/or driven on a roadway. Miscellaneous surface coating operations are those that involve the spray application of coatings that contain compounds of chromium, lead, manganese, nickel, or cadmium, herein after referred to as target HAP, to miscellaneous parts and/or products made of metal or plastic, or combinations of metal and plastic. In general, the facilities and entities potentially affected by the proposed amendments to 40 CFR part 63, subpart HHHHHH are covered under the North American Industrial Classification System (NAICS) Codes listed in the following table. However, facilities

classified under other NAICS codes may be subject to the proposed amendments if they meet the applicability criteria.

Table 1. NESHAP, Industrial and Government Sources Affected By This Proposed Action

NESHAP Source Category	NAICS Code	Regulated Entities[1]
Aerospace Equipment	336413	Aircraft engines, aircraft parts, aerospace ground equipment.
	336414	
	336415	
	54171	
Automobiles and Automobile Parts	335312	Engine parts, vehicle parts and accessories, brakes, axles, etc. Motor vehicle body manufacturing and automobile assembly plants. New and used car dealers. Automotive body, paint, and interior repair and maintenance.
	336111	
	336211	
	336310	
	33632	
	33633	
	33634	
	33637	
	336390	
	441110	
	441120	
	811121	
Chemical Manufacturing and Product Preparation	325110	Petrochemicals, Industrial Gases, Inorganic Dyes and Pigments, Basic Inorganic and Organic Chemicals, Cyclic Crude and Intermediates, Ethyl Alcohol, Miscellaneous Chemical Production and Preparation.
	325120	
	325130	
	325180	
	325192	
	325193	
	325199	
	325998	
Extruded Aluminum	331318	Extruded aluminum, architectural components, coils, rod, and tubes.
	331524	
	332321	
	332323	
Government	Not Applicable	Government entities, besides Department of Defense, that maintain vehicles, such as school buses, police and emergency vehicles, transit buses, or highway maintenance vehicles.
Heavy Equipment	33312	Tractors, earth moving machinery.

	333611	
	333618	
Job Shops	332312	Manufacturing industries not elsewhere classified (e.g., bezels, consoles, panels, lenses).
	332722	
	332813	
	332991	
	332999	
	334118	
	336413	
	339999	
Large Trucks and Buses	33612	Large trucks and buses.
	336211	
Metal Buildings	332311	Prefabricated metal buildings, carports, docks, dwellings, greenhouses, panels for buildings.
Metal Containers	33242	Drums, kegs, pails, shipping containers.
	81131	
	322219	
	331513	
	332439	
Metal Pipe and Foundry	331110	Plate, tube, rods, nails, etc.
	331513	
	33121	
	331221	
	331511	
Rail Transportation	33651	Brakes, engines, freight cars, locomotives.
	482111	
Recreational Vehicles and Other Transportation Equipment	321991	Mobile Homes. Motorcycles, motor homes, semi-trailers, truck trailers. Miscellaneous transportation related equipment and parts. Travel trailer and camper manufacturing.
	3369	
	331318	
	336991	
	336211	
	336112	
	336212	
	336213	
	336214	
	336390	
	336999	
	33635	
	56121	
	8111	
	56211	
	326291	

Rubber-to- Metal Products	326299	Engine mounts, rubberized tank tread, harmonic balancers.
Structural Steel	332311	Joists, railway bridge sections, highway bridge sections.
	332312	
Waste Treatment, Disposal, and Materials Recovery	562211	Hazardous Waste Treatment and Disposal, Solid Waste Landfill, Solid Waste Combustors and Incinerators, Other Nonhazardous Waste Treatment and Disposal, Materials Recovery
	562212	
	562213	
	562219	
	562920	
Other Industrial and Commercial	211130	Natural Gas Liquid Extraction.
	311942	Spices and Extracts.
	331313	Alumina Refining.
	337214 811420	Office furniture, except wood. Reupholstery and Furniture Repair.
	325211	Plastics Material Synthetic Resins, and Nonvulcanizable Elastomers.
	325510	Paint and Coating Manufacturing.
	32614, 32615	Plastic foam products (e.g., pool floats, wrestling mats, life jackets).
	326199	Plastic products not elsewhere classified (e.g., name plates, coin holders, storage boxes, license plate housings, cosmetic caps, cup holders).
	333316	Office machines.
	33422	Radio and television broadcasting and communications equipment (e.g., cellular telephones).
	339112, 339113, 339114, 339115, 339116	Medical equipment and supplies.
	33992	Sporting and athletic goods.
	33995	Signs and advertising specialties.
	336611, 336612	Boat and ship building
	713930	Marinas, including boat repair yards

[1] Regulated entities means area source facilities that use MeCl to strip paint or apply surface coatings to these parts or products.

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

In addition to being available in the docket for this action, an electronic copy of this proposed action is available on the Internet. Following signature by the EPA Administrator, the EPA will post a copy of this proposed action at *https://www.epa.gov/stationary-sources-air-*

pollution/paint-stripping-and-miscellaneous-surface-coating-operations. Following publication in the *Federal Register*, the EPA will post the *Federal Register* version of the proposal and key technical documents at this same website.

The proposed changes to the CFR that would be necessary to incorporate the changes proposed in this action are set out in an attachment to the memorandum titled *Proposed Regulation Edits for 40 CFR part 63, subpart HHHHHH,* available in the docket for this action (Docket ID No. EPA-HQ-OAR-2021-0016). The document includes the specific proposed amendatory language for revising the CFR and, for the convenience of interested parties, a redline version of the regulation. Following signature by the EPA Administrator, the EPA will also post a copy of this memorandum and the attachments to *https://www.epa.gov/stationary-sources-air-pollution/paint-stripping-and-miscellaneous-surface-coating-operations*.

II. Background

A. What is the statutory authority for this action?

The statutory authority for this action is provided by sections 112 and 301 of the CAA, as amended (42 U.S.C. 7401 *et seq.*). Section 112(d)(6) requires the EPA to review standards promulgated under CAA section 112(d) and revise them "as necessary (taking into account developments in practices, processes, and control technologies)" no less often than every 8 years following promulgation of those standards. This is referred to as a "technology review" and is required for all standards established under CAA section 112(d) including generally available control technology (GACT) standards that apply to area sources.[1] This action constitutes the 112(d)(6) technology review for the Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources area source NESHAP.

Several additional CAA sections are relevant to this action as they specifically address regulation of hazardous air pollutant emissions from area sources. Collectively, CAA sections 112(c)(3), (d)(5), and (k)(3) are the basis of the Area Source Program under the Urban Air Toxics Strategy, which provides the framework for regulation of area sources under CAA section 112.

Section 112(k)(3)(B) of the CAA requires the EPA to identify at least 30 HAP that pose the greatest potential health threat in urban areas with a primary goal of achieving a 75-percent reduction in cancer incidence attributable to HAP emitted from stationary sources. As discussed in the Integrated Urban Air Toxics Strategy (64 FR 38706, 38715, July 19, 1999), the EPA identified 30 HAP emitted from area sources that pose the greatest potential health threat in urban areas, and these HAP are commonly referred to as the "30 urban HAP."

Section 112(c)(3), in turn, requires the EPA to list sufficient categories or subcategories of area sources to ensure that area sources representing 90 percent of the emissions of the 30 urban HAP are subject to regulation. The EPA implemented these requirements through the Integrated Urban Air Toxics Strategy by identifying and setting standards for categories of area sources including the Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources source categories that are addressed in this action.

CAA section 112(d)(5) provides that for area source categories, in lieu of setting maximum achievable control technology (MACT) standards (which are generally required for major source categories), the EPA may elect to promulgate standards or requirements for area sources "which provide for the use of generally available control technology or management practices [GACT] by such sources to reduce emissions of hazardous air pollutants." In developing such standards, the EPA evaluates the control technologies and

management practices that reduce HAP emissions that are generally available for each area source category. Consistent with the legislative history, we can consider costs and economic impacts in determining what constitutes GACT.

GACT standards were set for the Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources source categories in 2008. As noted above, this proposed action presents the required CAA 112(d)(6) technology review for those source categories.

B. What are the source categories and how does the current NESHAP regulate their HAP emissions?

1. Source Category Descriptions

The NESHAP for the Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources source categories was promulgated on January 9, 2008 (73 FR 1738), and is codified at 40 CFR 63, subpart HHHHHH. Technical corrections were promulgated on February 13, 2008 (73 FR 8408).

The sources that are affected by 40 CFR part 63, subpart HHHHHH, and would be affected by the proposed amendments are area sources engaged in paint stripping using MeCl, and/or engaged in coating of miscellaneous parts and/or products made of metal or plastic, or combinations of metal and plastic, or motor vehicle or mobile equipment refinishing.

The affected source is broadly defined to include all operations associated with the removal of dried paint from a substrate using MeCl or the spray application of coatings. These paint stripping operations include the use of MeCl-containing paint strippers by immersion, brushing on, and/or spraying on to remove a coating to change the color of the item or because the life of the coating has been exceeded, or to remove paint for inspection purposes or during

repair. These surface coating operations include the storage and mixing of coatings and other materials; surface preparation; coating application and flash-off; drying and curing of applied coatings; cleaning operations; and waste handling operations.

Surface coating operations are those that involve the application of coatings at area sources to (1) miscellaneous parts and/or products made of metal or plastic, or combinations of metal and plastic; or (2) motor vehicles and mobile equipment (e.g., heavy duty-trucks, buses, construction equipment, self-propelled vehicles and equipment that may be drawn and/or driven on a roadway), hereinafter referred to as autobody and mobile equipment refinishing.

The NESHAP defines a "coating" as "a material spray-applied to a substrate for decorative, protective, or functional purposes. For the purposes of this subpart, coating does not include the following materials: (1) Decorative, protective, or functional materials that consist only of protective oils for metal, acids, bases, or any combination of these substances. (2) Paper film or plastic film that may be pre-coated with an adhesive by the film manufacturer. (3) Adhesives, sealants, maskants, or caulking materials. (4) Temporary protective coatings, lubricants, or surface preparation materials. (5) In-mold coatings that are spray-applied in the manufacture of reinforced plastic composite parts." (40 CFR 63.11180).

The NESHAP does not apply to paint stripping or surface coating operations that are specifically covered under another area source NESHAP, and does not apply to paint stripping or surface coating operations that meet any of the following:

- Paint stripping or surface coating performed on-site at installations owned or operated by the Armed Forces of the United States (including the Coast Guard and the National Guard of any such state), the National Aeronautics and Space Administration, or the National Nuclear Security Administration.

- Paint stripping or surface coating of military munitions manufactured by or for the Armed Forces of the United States (including the Coast Guard and the National Guard of any such state) or equipment directly and exclusively used for the purposes of transporting military munitions.
- Paint stripping or surface coating performed by individuals on their personal vehicles, possessions, or property, either as a hobby or for maintenance of their personal vehicles, possessions, or property. The NESHAP also does not apply when these operations are performed by individuals for others without compensation. An individual who spray applies surface coating to more than two motor vehicles or pieces of mobile equipment per year is subject to the requirements in this subpart that pertain to motor vehicle and mobile equipment surface coating regardless of whether compensation is received.
- Paint stripping or surface coating for research and laboratory activities, for quality control activities, or for activities that are covered under another area source NESHAP.

Based on our search of the National Emission Inventory (NEI) (*www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei*) and the EPA's Enforcement and Compliance History Online (ECHO) database (*echo.epa.gov)*, we estimate that at least 3,000 facilities are subject to the Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources NESHAP. A list of facilities subject to the NESHAP found in the ECHO database is included in a file, titled *Facility List for Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources*, which is available in the docket for this action. However, these data are not likely to be comprehensive for these source categories because not all states submit data

to ECHO for smaller sources such as these. We also observed that some states with large populations did not have as many facilities in the ECHO database as expected based on population, indicating inconsistent reporting of these facilities among states.

2. HAP Emission Sources

This section describes the emission sources for paint stripping and miscellaneous coating operations.

Paint Stripping Operations

The HAP for which the EPA listed this source category pursuant to CAA section 112(c)(3) is the MeCl contained in paint stripper formulations. The primary source of the MeCl emissions in this source category comes from evaporative losses during the use and storage of MeCl-containing paint strippers.

Surface Coating Operations

The EPA listed the area source surface coating operations categories pursuant to CAA section 112(c)(3) based on emissions of cadmium, chromium, lead, manganese, and nickel compounds. These target HAP emissions from miscellaneous coating operations are the heavy metals contained in the coatings (*e.g.*, in corrosion-resistant primers and as the pigments in topcoats). The target HAP compounds are emitted as the coatings are atomized during spray application. A substantial fraction of coating that is atomized does not reach the part and becomes what is termed "overspray."The fraction that becomes overspray depends on many variables, but two of the most important are the type of spray equipment being used and the skill of the painter. Some overspray lands on surfaces of the spray booth and the masking paper that is usually placed around the surface being sprayed, but the rest of the overspray is drawn into the

spray booth exhaust system. If the spray booth has filters, most of the overspray is captured by the filters; otherwise, it is exhausted to the atmosphere.

After coating application, the spray gun must be cleaned to remove the remaining coating before it cures and to prepare the spray gun for the next coating job. Spray guns are usually cleaned in a device, commonly referred to as an enclosed spray gun washer, that consists of a solvent reservoir and a covered enclosure that dispenses solvent for gun cleaning. The enclosure may hold the gun for automated gun cleaning. During gun cleaning, target HAP from the coating may be emitted if the cleaning solvent is sprayed through the gun during cleaning.

3. Current NESHAP Requirements for Control of HAP

Paint Stripping Operations

All sources conducting paint stripping involving the use of MeCl must implement management practice standards that reduce emissions of MeCl by minimizing evaporative losses of MeCl.

In addition to the management practices, sources that use more than one ton of MeCl, per year, must develop and implement a MeCl minimization plan consisting of a written plan with the criteria to evaluate the necessity of MeCl in the stripping operations and management techniques to minimize MeCl emissions when it is needed in the paint stripping operation.

The MeCl minimization plan evaluation criteria specify only using a MeCl-containing paint stripper when an alternative on-site stripping method or material is incapable of accomplishing the work as determined by the operator. Alternative methods to reduce MeCl usage may include: (1) non- or low-MeCl-containing chemical strippers; (2) mechanical stripping; (3) abrasive blasting (including dry or wet media); or (4) thermal and cryogenic decomposition.

The management practices required to be contained in the plan include optimizing stripper application conditions, reducing exposure of stripper to the air, and practicing proper storage and disposal of materials containing MeCl. Sources are required to submit the plan to their delegated authority, keep a written copy of the plan on site and post a placard or sign outlining the evaluation criteria and management techniques in each area where MeCl-containing paint stripping operations occur. They are also required to review the plan annually and update it based on the experiences of the previous year or the availability of new methods of stripping, and to keep a record of the review and changes made to the plan on file. Sources must maintain copies of the specified records for a period of at least five years after the date of each record.

Surface Coating Operations

All motor vehicle and mobile equipment surface coating operations and those miscellaneous surface coating operations that spray-apply coatings containing the target HAP must apply the coatings with a high volume, low pressure (HVLP) spray gun, electrostatic spray gun, airless spray gun, air-assisted airless spray gun, or a gun demonstrated to be equal in transfer efficiency to an HVLP spray gun. All spray-applied coatings must be applied in a prep station or spray booth. For motor vehicle and mobile equipment surface coating, prep stations and spray booths that are large enough to hold a complete vehicle must have four complete side walls or curtains and a complete roof. For motor vehicle and mobile equipment subassemblies and for miscellaneous surface coating, coatings must be spray applied in a booth with a full roof and at least three walls or side curtains. Openings are allowed in the sidewalls and roof of booths used for miscellaneous surface coating to allow for parts conveyors, if needed. The exhaust from the prep station or spray booth must be fitted with filters demonstrated to achieve at least 98 percent capture efficiency of paint overspray.

Additionally, sources are required to demonstrate that 1) all painters that spray-apply coatings are certified as having completed operator training to improve coating transfer efficiency and minimize overspray and 2) that no spray gun cleaning is performed by spraying solvent through the gun creating an atomized mist (*i.e.*, spray guns are cleaned in an enclosed spray gun cleaner or by cleaning the disassembled gun parts by hand). Each painter must be certified as having completed classroom and hands-on training in the proper selection, mixing, and application of coatings, and must complete refresher training at least once every 5 years. The initial and refresher training must address the following topics:

- Spray gun equipment selection, set up, and operation, including measuring coating viscosity, selecting the proper fluid tip or nozzle, and achieving the proper spray pattern, air pressure and volume, and fluid delivery rate.
- Spray technique for different types of coatings to improve transfer efficiency and minimize coating usage and overspray, including maintaining the correct spray gun distance and angle to the part, using proper banding and overlap, and reducing lead and lag spraying at the beginning and end of each stroke.
- Routine spray booth and filter maintenance, including filter selection and installation.
- Environmental compliance with the requirements of this subpart.

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

For this technology review, we used information from the EPA's ECHO database to identify facilities subject to the NESHAP. The ECHO database provides integrated compliance and enforcement information for approximately 800,000 regulated facilities nationwide. We supplemented the ECHO database information with data provided by EPA Region 4. Using the

feature in ECHO to search by NESHAP subpart, the EPA identified approximately 3,000 facilities as subject to this NESHAP. However, these data are not likely to be comprehensive for these source categories because not all states submit data to ECHO for smaller sources such as these, and we also observed that some states with large populations did not have as many facilities in the ECHO database as expected based on population. The compliance history data in ECHO does not contain detailed information on non-compliance and enforcement actions involving the facilities subject to 40 CFR part 63, subpart HHHHHH, that could be used to identify developments in practices, processes, and control technologies, or other rule changes that are needed.

Also, for the technology review, we collected information from the reasonably available control technology (RACT), best available control technology (BACT), and lowest achievable emission rate (LAER) determinations in the EPA's RACT/BACT/LAER Clearinghouse (RBLC).[1] This database contains case-specific information on air pollution technologies that have been required to reduce the emissions of air pollutants from stationary sources. Under the EPA's New Source Review (NSR) program, an NSR permit must be obtained if a facility is planning new construction that increases the air emissions of any regulated NSR pollutant at or above 100 or 250 tpy (or a lower threshold depending upon nonattainment severity) or a modification that results in a significant emissions increase and a significant net emissions increase of any regulated NSR pollutant ("significant" emissions increase is defined in the NSR regulations and is pollutant-specific, ranging from less than 1 pound (lb) to 100 tpy of the

[1] *https://www.epa.gov/catc/ractbactlaer-clearinghouse-rblc-basic-information.*

applicable regulated NSR pollutant). This central database promotes the sharing of information among permitting agencies and aids in case-by-case determinations for NSR permits. We examined information contained in the RBLC to determine what technologies are currently used for these surface coating and paint stripping operations to reduce air emissions.

Additional information about these data collection activities for the technology review is contained in the memoranda titled *Technology Review for Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources*, July 2021, available in the docket for this action.

The EPA also performed a literature search for information on alternatives to coatings that contain the target metal HAP and alternative processes to reduce emissions from the application of these coatings, and for alternatives to chemical paint stripping using MeCl-containing paint stripping materials.

The EPA also reviewed data collected as part of the National Small Business Environmental Assistance Program (SBEAP) (*https://nationalsbeap.org/).* This program and the data collected are used to assist companies in complying with 40 CFR part 63, subpart HHHHHH. These data include lists of coatings provided by the coating manufacturers that are commonly used in autobody and mobile equipment refinishing operations. The lists indicate whether each coating contains the target HAP, and whether substitute coatings are available that do not contain the target HAP. The EPA also contacted coatings suppliers, through state members of the SBEAP, to collect information on alternative coatings that do not contain the target HAP and current best practices to minimize emissions during coating application. The EPA also reached out to industry representatives for input regarding developments in technology and practices that have occurred since promulgation of the original rule.

D. What other relevant background information and data are available?

As part of the technology review for the Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources NESHAP source categories, we reviewed information available in the American Coatings Association's (ACA) *Industry Market Analysis*, 9th Edition (2014 – 2019).[2] The *ACA Industry Market Analysis* provided information on trends in coatings technology that can affect emissions from the source categories. Additional details regarding our review of this information source are contained in the *Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources Technology Review Memo*, available in the docket for this action.

E. How does the EPA perform the technology review?

Our technology review focuses on the identification and evaluation of developments in practices, processes, and control technologies that have occurred since the GACT standards were promulgated. Where we identify such developments, we analyze their technical feasibility, estimated costs, energy implications, and non-air environmental impacts. We also consider the emission reductions associated with applying each development. This analysis informs our decision of whether it is "necessary" to revise the emissions standards. In addition, we consider the appropriateness of applying controls to new sources versus retrofitting existing sources. For this exercise, we consider any of the following to be a "development":

- Any add-on control technology or other equipment that was not identified and considered during development of the original GACT standards;

[2] Prepared for the ACA, Washington, DC, by The ChemQuest Group, Inc., Cincinnati, Ohio. 2015.

- Any improvements in add-on control technology or other equipment (that were identified and considered during development of the original GACT standards) that could result in additional emissions reduction;
- Any work practice or operational procedure that was not identified or considered during development of the original GACT standards;
- Any process change or pollution prevention alternative that could be broadly applied to the industry and that was not identified or considered during development of the original GACT standards; and
- Any significant changes in the cost (including cost effectiveness) of applying controls (including controls the EPA considered during the development of the original GACT standards).

In addition to reviewing the practices, processes, and control technologies that were considered at the time we originally developed the NESHAP, we review a variety of data sources in our investigation of potential practices, processes, or controls that may have not been considered during development of the NESHAP. Among the sources we reviewed were the NESHAP technology reviews for various industries that were completed after the GACT standard being reviewed in this action (*e.g.,* NESHAP for Aerospace Manufacturing and Rework (40 CFR part 63, subpart GG), NESHAP for Surface Coating of Metal Parts and Products (40 CFR part 63, subpart MMMM), and NESHAP for Surface Coating of Plastic Parts and Products (40 CFR 63, subpart PPPP)). We also reviewed the regulatory requirements and/or technical analyses associated with these regulatory actions to identify any practices, processes, and control technologies considered in these efforts that could be applied to emission sources in the Paint Stripping and Surface Coating source categories, as well as the costs, non-air impacts, and

energy implications associated with the use of these technologies. Finally, we reviewed information from other sources, such as state and/or local permitting agency databases and industry-specific market analyses and trade journals, to research advancements in add-on controls and lower HAP technology for coatings. For a more detailed discussion of our methods for performing these technology reviews, refer to the *Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources Technology Review Memo*, available in the docket for this action.

III. Analytical Results and Proposed Decisions

A. What are the results and proposed decisions based on our technology review, and what is the rationale for those decisions?

As described in sections II.C, D, and E of this preamble, our technology review focused on identifying developments in practices, processes, and control technologies for the three source categories. The EPA reviewed various information sources regarding emission sources that are currently regulated by the NESHAP to support the technology review. The information sources included the following: the RBLC; state regulations; facility operating permits; other NESHAP-related regulatory actions, including technology reviews for other surface coating NESHAPs promulgated after this NESHAP was finalized in 2008; and industry information. The primary emission sources for the technology review included the following: the spray applied coating operations and paint stripping operations using MeCl containing paint stripping materials.

Based on our review, we did not identify any add-on control technologies, process equipment, management practices or procedures that were not previously considered during development of the 2008 Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources NESHAP, and we did not identify any new or improved add-on control technologies

that would result in additional emission reductions. A brief summary of the EPA's findings in conducting the technology review of Paint Stripping and Surface Coating operations follows. For a detailed discussion of the EPA's findings, refer to the memorandum, *Technology Review for Paint Stripping and Miscellaneous Surface Coating Source Categories*, in the docket for this action.

During the development of the 2008 Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources NESHAP, management practices were determined for new and existing area sources performing spray applied coating operations using coatings containing the target HAP and for paint stripping operations using MeCl containing materials. The development of the surface coating management practices was based on the following:

- Numerous visits to area source surface coating operations;
- The surface coating industry's use of high efficiency coatings spray equipment, filtered spray booths, and enclosed spray gun cleaners; and
- The EPA's review of available operator training programs.

The paint stripping management practices were based on a detailed study of the paint stripping industry[3] and visits to numerous paint stripping operations.

Paint Stripping Operations

Our search of the RBLC database for improvements in paint stripping technologies provided results for two facilities with permit dates of 2008 or later. Facilities reported the use of VOC emission limits, and work practices in compliance with the Aerospace NESHAP.

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[3] *Source Reduction and Recycling of Halogenated Solvents in Paint Stripping* - Technical Support Document - A Report on Research Performed by the Source Reduction Research Partnership for the Metropolitan Water District and the Environmental Defense Fund. Prepared By Jacobs Engineering Group Inc. Pasadena, CA. 1990.

We also reviewed the results of the technology review for the Aerospace Manufacturing and Rework Facilities NESHAP (40 CFR part 63, subpart GG). The Aerospace NESHAP regulates emissions from depainting operations (40 CFR 63.746) and limits the amount of organic HAP in chemical strippers used per aircraft, and also has provisions to limit inorganic HAP emissions from non-chemical (e.g., abrasive blasting) depainting operations. As part of that technology review for chemical depainting, the EPA examined Washington State's records of permits for Aerospace Manufacturing and Rework Facilities and identified a 2013 PSD permit amendment that requires the VOC vapor pressure of cleaning solvents and chemical strippers used in depainting operations to be less than 45 mm Hg. It should be noted that the Aerospace NESHAP does not prescribe vapor pressure limits to chemical depainting strippers, but instead has capture and control and volume usage limits for chemical depainting operations that use HAP containing chemical strippers. Otherwise, facilities must use non-HAP chemical strippers. Therefore, the EPA determined that the Aerospace NESHAP was at least as stringent as the Washington State PSD permit requirements. The technology review for the Aerospace NESHAP did not identify any developments in processes or control technologies to reduce organic HAP emissions from chemical depainting operations. (80 FR 8392, February 17, 2015). The Idaho state general permit program for automobile body shops was more restrictive, such that Idaho will not issue a general permit to body shops that are using MeCl as a paint remover.[4] However, the 2008 Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources NESHAP did consider numerical emission limits but determined that they would not be feasible

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[4] Idaho Department of Environmental Quality. *Streamlined air permitting processes for qualifying automotive coating operations.* Revision 6; April 2017. (Accessed June 2021 *https://www2.deq.idaho.gov/admin/LEIA/api/document/download/5194*).

due to the variability in operational parameters and variety of work being performed. Similar to the Aerospace NESHAP, the 2008 Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources NESHAP decided to not limit or ban the use of MeCl-based paint strippers, determining instead to set management practices that reduced emissions and encourage the substitution of alternative stripping technologies where they could feasibly be employed. All of these control technologies were in use by the paint stripping industry during development of the NESHAP or already were considered in the development of the NESHAP. In this review, for purposes of these area source GACT standards, we have again determined that these measures could not feasibly be broadly applied to the industry. Therefore, we concluded that the results of the search did not result in any broadly applied improvements in add-on control technology or other equipment.

In conclusion, for the Paint Stripping source category, we did not identify developments in practices, processes, or control technologies broadly applied to the industry during review of the RBLC, the state rules, and subsequent NESHAP that were not already identified and considered during the Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources NESHAP development. We are maintaining our approach of setting widely applicable control technology and management practice standards, while encouraging emissions reductions, such as from product reformulations, where appropriate. The current standards effectively reduce emissions while encouraging sources to further reduce emissions. We identified no improvements broadly applied to the industry or changes in costs. We do not consider the practices we found to be developments for the purposes of this technology review, and continue to determine that they do not warrant revisions to the current emission standards.

Surface Coating Operations

For this technology review, we consulted state rules and operating permits. California has an existing surface coating rule, Airborne Toxic Control Measure for Emissions of Hexavalent Chromium and Cadmium from Motor Vehicle and Mobile Equipment Coatings (ATCM)[5], that prohibits the use, possession, sale, supply, or manufacture for sale in California of any motor vehicle or mobile equipment coating that contains hexavalent chromium or cadmium.[6] While increased compliance costs were expected to raise the prices of coating materials for automotive body paint shops, the California Air Resources Board predicted that these shops would pass the material price increase to consumers, so the impacts to auto body shops would be negligible.[7] In the original NESHAP, the EPA chose not to prohibit the use of coatings that contain any of the heavy metals or target HAP for these source categories. We determined that a nationwide prohibition would impose unreasonable burden on the industry and could force facilities out of business due to a lack of alternative materials that could address the performance criteria (*e.g.*, corrosion protection) that may be used in all environments across the United States.[8] For this technology review, we determined that vendors representing a large market share in the sectors relevant to the NESHAP, specifically coating manufacturers that supply automobile and mobile equipment refinishing coatings, have modified product lines such that non-target HAP products

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[5] California Air Resources Board. *Automotive Refinishing. https://ww2.arb.ca.gov/our-work/programs/coatings/automotive-refinishing.*

[6] California Code of Regulations. *Hexavalent Chromium and Cadmium Airborne Toxic Control Measure - Motor Vehicle and Mobile Equipment Coatings*. 17 CCR § 93112. (Accessed April 2021 *https://govt.westlaw.com/calregs/Document/I317A88D0D60811DE88AEDDE29ED1DC0A?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)).*

[7] California Air Resources Board. *Initial Statement of Reasons for Proposed Rulemaking: Airborne Toxic Control Measure for Emissions of Hexavalent Chromium and Cadmium from Motor Vehicle and Mobile Equipment Coatings*, p. V-1. (Accessed April 2021 *https://ww2.arb.ca.gov/sites/default/files/2020-12/ISOR_auto_finish_9-01.pdf*).

[8] US EPA. (September 2007). Proposed rule: *National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources*. 72 FR 52967.

are more readily available. However, in this technology review we still determined that a nationwide prohibition would impose unreasonable burden on the industry, and that other approaches are better suited to reduce emissions. Sources carry out a wide variety of surface coating operations, with different performance criteria, and target HAP-free alternatives would not be viable substitutes for many purposes. Furthermore, as demonstrated by wider adoption of target HAP-free products, the industry is already reducing the usage of target-HAP containing coatings as available, and within their operating requirements, alongside the emission reductions already achieved by implementation of the NESHAP. In addition to the ATCM outlined above, California's South Coast Air Quality Management District (AQMD) adopted a rule for Spraying Operations Using Coatings Containing Chromium (Rule 1469.1) in March 2005.[9] This rule includes requirements for spray transfer efficiency, spray booth operation, housekeeping, monitoring, reporting, and recordkeeping, and in June 2021, South Coast AQMD proposed an amended rule. These amendments aim to further reduce emissions of hexavalent chromium from spraying operations as well as operations such as dried chromate coating removal. They also minimize the accumulation of materials that may contain chromates outside of spray booths that may lead to fugitive emissions.[10] However, these practices were already identified during development of the 2008 Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources NESHAP, and as stated above, we do not consider the burden imposed by these practices to be warranted for requirements that would apply to these disparate industries and

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[9] South Coast Air Quality Management District. *Spraying Operations Using Coatings Containing Chromium*. (Accessed June 2021 *http://www.aqmd.gov/docs/default-source/rule-book/reg-xiv/rule-1469-1.pdf*).

[10] South Coast Air Quality Management District. Draft Staff Report: *Proposed Amended Rule 1469.1 – Spraying Operations Using Coatings Containing Chromium*. (Accessed June 2021 *http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1469.1/par1469-1_dsr_040621.pdf?sfvrsn=6*).

applications. We are maintaining our approach of setting widely applicable control technology and management practice standards, while encouraging emissions reductions, such as from product reformulations, where appropriate. The current standards effectively reduce emissions while encouraging sources to further reduce emissions. Therefore, we do not consider these practices to constitute new or improved add-on control technologies that would result in additional emission reductions.

Under the authority of the Federal Minor Source Review Program (40 CFR 49.151), the EPA issued a permit by rule for new or modified true minor source automobile body repair and miscellaneous surface coating operations in Indian Country (40 CFR 49.162). This permit by rule addresses VOC emissions, but does not address inorganic HAP emissions and does not address paint stripping operations. The permit by rule mirrors the requirements in 40 CFR part 63, subpart HHHHHH, for operator training, spray booths and spray booth filters, and high-efficiency spray guns, but differs in that the exemption for spray guns with a cup capacity less than 3.0 fluid ounces does not apply in serious, severe, and extreme ozone nonattainment areas; instead, in those areas all spray-applied coating operations must be applied with an HVLP spray gun, low volume low pressure (LVLP) spray gun, or air brush spray operation, or with an equivalent spray technology that has been demonstrated by the spray gun manufacturer to achieve a transfer efficiency comparable to that of an HVLP spray gun. The EPA examined 10 state permitting examples for the permit by rule. Three of the 10 state general permit programs for automobile body shops include the requirements of 40 CFR part 63, subpart HHHHHH, but

some individual states are more restrictive.[11] These issues were considered during development of the 2008 Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources NESHAP and do not represent new or improved add-on control technologies that would result in additional emission reductions.

The RBLC database search for improvements in surface coating technologies provided results for 10 facilities with permit dates of 2011 or later (the compliance date for existing sources in 40 CFR part 63, subpart HHHHHH, is January 10, 2011). Facilities reported the use of high-efficiency application methods (*e.g.*, robotic application, electrostatic spray), good work practices, and regenerative thermal oxidizers (RTO) with an established reduction and exhaust gas VOC concentration limits (*i.e.*, 3-hour average of 95 percent removal and 12 parts per million by volume). However, RTO are used to destroy organic compounds and would not be effective at reducing emissions of metal target HAP from spray applied coating operations. All of these control technologies were in use by the surface coating industry during development of the NESHAP and already were considered in the development of the NESHAP. We identified no improvements or changes in costs. Therefore, we concluded that the results of the RBLC search did not result in any improvements in add-on control technology or other equipment.

We also reviewed the results of the technology review for the Aerospace Manufacturing and Rework Facilities NESHAP (40 CFR part 63, subpart GG). The Aerospace NESHAP regulates emissions of inorganic HAP from the spray application of primers and topcoats (40 CFR 63.745) by requiring the spray application of coatings containing inorganic HAP to be

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[11] U.S. Environmental Protection Ageney. (February 2017). *Background Document: Air Quality Permit by Rule for New or Modified True Minor Source Auto Body Repair and Miscellaneous Surface Coating Operations in Indian Country*. (Accessed April 2021 *https://www.epa.gov/sites/production/files/2016-05/documents/autobodybackgrounddocument032315final.pdf*).

performed in a spray booth or similar enclosure that is exhausted through a filter. The technology review for the Aerospace NESHAP did not identify any developments in processes or control technologies to reduce inorganic HAP emissions from primer and topcoat operations. (80 FR 8392, February 17, 2015)

In conclusion, for the Surface Coating source categories, we did not identify developments in practices, processes, or control technologies during review of the RBLC, the state rules, and subsequent NESHAP that were not already identified and considered during the Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources NESHAP development. We identified no improvements or changes in costs. We do not consider the practices that we found to be developments for the purposes of this technology review, and continue to determine that they do not warrant revisions to the current emission standards.

B. What other actions are we proposing, and what is the rationale for those actions?

1. Electronic Reporting Requirements

The EPA is proposing that owners and operators of paint stripping and surface coating facilities submit electronic copies of initial notifications required in 40 CFR 63.9(b) and 63.11175(a), notifications of compliance status required in 40 CFR 63.9(h) and 63.11175(b), the annual notification of changes report required in 40 CFR 63.11176(a), and the report required in 40 CFR 63.11176(b) through the EPA's Central Data Exchange (CDX) using the Compliance and Emissions Data Reporting Interface (CEDRI). For further information regarding the electronic data submission process, please refer to the memorandum titled *Electronic Reporting for New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) Rules*, available in the docket for this action. No specific form is necessary for the initial notifications required in 40 CFR 63.9(b) and 63.11175(a), notifications

of compliance status required in 40 CFR 63.9(h) and 63.11175(b), the annual notification of changes report required in 40 CFR 63.11176(a), and the report required in 40 CFR 63.11176(b). The notifications will be required to be submitted via CEDRI in portable document format (PDF) files.

Additionally, the EPA has identified two broad circumstances in which electronic reporting extensions may be provided. In both circumstances, the decision to accept the claim of needing additional time to report is within the discretion of the Administrator, and reporting should occur as soon as possible. The EPA is providing these potential extensions to protect owners and operators from noncompliance in cases where they cannot successfully submit a report by the reporting deadline for reasons outside of their control. The situation where an extension may be warranted due to outages of the EPA's CDX or CEDRI which precludes an owner or operator from accessing the system and submitting required reports is addressed in 40 CFR 63.9(b), notifications of compliance status required in 40 CFR 63.9(h), the annual notification of changes report required in 40 CFR 63.11176(a), and the MeCl report required in 40 CFR 63.11176(b). The situation where an extension may be warranted due to a *force majeure* event, which is defined as 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 an owner or operator from complying with the requirement to submit a report electronically as required by this rule is addressed in 40 CFR 63.3120(g). 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.

The electronic submittal of the reports addressed in this proposed rulemaking has several benefits: electronic submittal will increase the usefulness of the data contained in those reports,

is in keeping with current trends in data availability and transparency, will further assist in the protection of public health and the environment, will improve compliance by facilitating the ability of regulated facilities to demonstrate compliance with requirements and by facilitating the ability of delegated state, local, tribal, and territorial air agencies and the EPA to assess and determine compliance, and will ultimately reduce burden on regulated facilities, delegated air agencies, and the EPA. Electronic reporting also eliminates 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. Moreover, electronic reporting is consistent with the EPA's plan[12] to implement Executive Order 13563 and is in keeping with the EPA's agency-wide policy[13] developed in response to the White House's Digital Government Strategy.[14] For more information on the benefits of electronic reporting, see the memorandum *Electronic Reporting Requirements for New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) Rules*, available in the docket for this action, Docket ID No. EPA-OAR-2021-0016.

2. Rule Clarifications and Other Changes

We are proposing plain language clarifications and revisions to better reflect regulatory intent. We also are proposing other changes, including updating references to equivalent test methods, making technical and editorial revisions, incorporation by reference (IBR) of

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[12] EPA's *Final Plan for Periodic Retrospective Reviews*, August 2011. Available at: *https://www.regulations.gov/document?D=EPA-HQ-OA-2011-0156-0154*.
[13] *E-Reporting Policy Statement for EPA Regulations*, September 2013. Available at: *https://www.epa.gov/sites/production/files/2016-03/documents/epa-ereporting-policy-statement-2013-09-30.pdf*.
[14] *Digital Government: Building a 21st Century Platform to Better Serve the American People*, May 2012. Available at: *https://obamawhitehouse.archives.gov/sites/default/files/omb/egov/digital-government/digital-government.html*.

alternative test methods, and simplifying the petition for exemption process. Our analyses and proposed changes related to these issues are discussed in the sections below.

a. Coating HAP Content Definition

The EPA is proposing to clarify that the definition of coatings that do not contain the target HAP is based on the HAP content of the coating as applied, not on the HAP content of the coating components as purchased from the coating supplier. However, coatings that meet the definition of coatings that do not contain the target HAP based on the HAP content as purchased will also meet the definition based on the HAP content as applied.

b. Spray Gun Cup Liners

The EPA is proposing to clarify that the allowance to use spray guns outside of a spray booth is based on the volume of the spray gun paint cup liner and not the volume of the paint cup, in those spray guns that use a disposable cup liner.

c. Submarines and Tanks Applicability

The EPA is proposing to clarify in this preamble that the surface coating and paint stripping of certain types of military equipment at area sources, such as military submarines (as opposed to those used for scientific research, for example) and military tanks is potentially subject to 40 CFR part 63, subpart HHHHHH, unless the surface coating or paint stripping is performed on site at installations owned or operated by the Armed Forces of the United States (including the Coast Guard and the National Guard of any such state), the National Aeronautics and Space Administration, or the National Nuclear Security Administration. Surface coating of this type of military equipment at original equipment manufacturers or offsite at a contractor's facility would not be covered by the provisions in 40 CFR 63.11169(d)(1), and would be subject to the requirements of 40 CFR part 63, subpart HHHHHH.

d. Circumvention of Paint Cup Capacity Intent

The EPA is proposing to clarify that the exclusion of spray guns with paint cup capacities equal to or less than 3.0 fluid ounces from the definition of spray-applied coatings operations was not intended to constitute an exemption from the NESHAP but was a threshold by which rule applicability for potentially regulated sources may be determined. This was due to the type and scope of operations which were to be regulated under the NESHAP. This clarification is consistent with, and would ensure that the rule clearly reflects, the position provided in a letter issued by the Office of Environmental Compliance and Assurance (OECA) stating that the EPA may find that persons who repeatedly refill and use a three-ounce cup, as a means of avoiding rule applicability, are attempting to circumvent the NESHAP. The EPA accordingly reserves the right to bring enforcement actions against any person whose action equates to rule circumvention.

e. OSHA Carcinogenic Content

The EPA is proposing to remove references to Occupational Safety and Health Administration (OSHA)-defined carcinogens as specified in 29 CFR 1910.1200(d)(4). The reference to OSHA-defined carcinogens as specified in 29 CFR 1910.1200(d)(4) was intended to specify the mass percent threshold above which compounds must be counted in identifying whether coatings are considered "target HAP containing" as defined in 40 CFR 63.11180. Target HAP compounds that are carcinogens must be counted if they are present at 0.1 percent by mass or greater and all other target HAP if they are present at 1.0 percent by mass or greater. We are proposing to remove this reference because 29 CFR 1910.1200(d)(4) has been amended and no longer readily defines which compounds are carcinogens. We are proposing to replace these references to OSHA-defined carcinogens and 29 CFR 1910.1200(d)(4) with a list of those target

HAP that must be counted if they are present at 0.1 percent by mass or greater. All other target HAP must be counted if they are present at 1.0 percent or greater by mass.

f. Non-HAP Solvent Language

The EPA is proposing to remove the definition of "non-HAP solvent" from 40 CFR 63.11180 because there are no requirements to use non-HAP solvents and the definition has no other use in the rule.

g. Filter Test Method

The EPA is proposing to update the spray booth filter test method which was previously incorporated by reference to the most recent American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) method. The rule currently cites ASHRAE Method 52.1, "Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter, June 4, 1992. This method was retired in January 2009, and replaced by ANSI/ASHRAE Standard 52.2-2017 Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size. The EPA is also proposing to include EPA Method 319—Determination of Filtration Efficiency for Paint Overspray Arrestors (Appendix A to 40 CFR part 63), as an alternative to ANSI/ASHRAE Standard 52.2-2017. This is the same method referenced in the NESHAP for Aerospace Manufacturing and Rework (40 CFR part 63, subpart GG) to test paint spray booth filters used to meet the requirements to limit hexavalent chromium emissions.

h. Petition for Exemption Process

The EPA is proposing a simplified petition for exemption process for motor vehicle or mobile equipment surface coating operations that do not spray apply any coatings that contain the target HAP. Currently all such sources are subject to the NESHAP, unless they demonstrate

to the satisfaction of the Administrator that they do not spray apply any coatings that contain the target HAP. Due to changes in coatings compositions across the industry, and the burden imposed without commensurate environmental benefit, we propose to allow sources to submit notification to the Administrator that they do not spray apply any coatings that contain the target HAP. Such sources would still be required to retain records that describe the coatings that are spray applied, but that information would not need to be reported - to determine whether that has been demonstrated to the satisfaction of the Administrator. The Administrator would maintain the authority to verify records retained on site, including whether the notification of exemption was sufficiently demonstrated. Sources may still petition for exemption using the existing process if they wish for a formal determination.

3. SSM Requirements

a. Elimination of the SSM Exemption

In its 2008 decision in *Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008), the United States Court of Appeals for the District of Columbia Circuit vacated portions of two provisions in the EPA's CAA section 112 regulations governing the emissions of HAP during periods of SSM. 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 section 112 standards apply continuously.

We note that the EPA amended the General Provisions in March 2021 to correct the CFR to reflect the court order in *Sierra Club* vacating the SSM exemptions.[15]

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[15] 86 FR 13819, March 11, 2021 - Court Vacatur of Exemption From Emission Standards During Periods of SSM.

Consistent with *Sierra Club v. EPA*, the standards in this rule apply at all times. We are also proposing a revision to Table 1 to subpart HHHHHH of 40 CFR part 63 (*Applicability of General Provisions to Subpart HHHHHH of Part 63*, hereafter referred to as the "General Provisions table to subpart HHHHHH"), as explained in more detail below in section III.B.3.b of this preamble.

In proposing these rule amendments, the EPA has taken into account startup and shutdown periods and, for the reasons explained below, has not proposed alternate standards for those periods. Startups and shutdowns are part of normal operations for the paint stripping and surface coating operations at area sources. Paint stripping and surface coating operations inherently involve frequent startup and shutdown while carrying out normal duties, and the NESHAP's emission standards were developed to control emissions in these situations. We have no data indicating that emissions are different during startup or shutdown than during other normal operations, and the current emission standards adequately control emissions during these startup and shutdown periods.

Periods of startup, normal operations, and shutdown are all predictable and routine aspects of a source's operations. Malfunctions, in contrast, are neither predictable nor routine. Instead malfunctions are, by definition, sudden, infrequent and not reasonably preventable failures of emissions control, process, or monitoring equipment. (40 CFR 63.2) (definition of malfunction). 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. This reading has been upheld as reasonable by the D.C. Circuit in *U.S. Sugar Corp. v. EPA*, 830 F.3d 579, 606-610 (2016).

However, it is unlikely that a malfunction would result in a violation of the standards or significant changes in emissions during paint stripping and surface coating operations at area source facilities. The NESHAP obligates facilities to follow implementation requirements for several stages of GACT or management practices, including application of coatings within a spray booth, using high efficiency spray application equipment, and a variety of other management practices. All facilities must comply with these management practice standards to minimize target HAP emissions from paint stripping and surface coating operations. These standards are not susceptible to malfunctions that would affect emissions, and if such malfunctions were to occur, the multiple layers of protection still reduce the likelihood that any single point of failure would result in a significant increase in emissions

In the unlikely event that a source fails to comply with the 40 CFR part 63, subpart HHHHHH as a result of a malfunction event, the EPA will determine an appropriate response based on, among other things, the good faith efforts of the source to minimize emissions during malfunction periods, including preventative and corrective actions, as well as root cause analyses to ascertain and rectify excess emissions. The annual notification of changes report required in 40 CFR 63.11176(a) already obligates sources to report deviations from relevant requirements in 40 CFR 63.11173. The EPA will also consider whether the source's failure to comply with the standard was, in fact, sudden, infrequent, not reasonably preventable, and was not instead caused, in part, by poor maintenance or careless operation. 40 CFR 63.2 (definition of malfunction).

If the EPA determines in a particular case that an enforcement action against a source for violation of an emission standard is warranted, the source can raise any and all defenses in that enforcement action and the Federal district court will determine what, if any, relief is

appropriate. The same is true for citizen enforcement actions. Similarly, the presiding officer in an administrative proceeding can consider any defense raised and determine whether administrative penalties are appropriate.

In summary, the EPA interpretation of the CAA and, in particular, CAA section 112 is reasonable and encourages practices that will avoid malfunctions. Administrative 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. *U.S. Sugar Corp. v. EPA*, 830 F.3d 579, 606-610 (D.C. Cir. 2016).

b. Proposed Revisions to the General Provisions Applicability Table

We are proposing to revise the General Provisions table to 40 CFR part 63, subpart HHHHHH (Table 1) entry for 40 CFR 63.6(e)(1)-(2) by changing the ''yes'' in column 3 to a ''no.'' Section 63.6(e)(1)(i) describes the general duty to minimize emissions. Some of the language in that section is not necessary or appropriate in light of the absence of an SSM exemption. We are proposing instead to add general duty regulatory text at 40 CFR §63.11173(h) that reflects the general duty to minimize emissions while eliminating the reference to periods covered by an SSM exemption. The current language in 40 CFR 63.6(e)(1)(i) characterizes what the general duty entails during periods of SSM. Without an SSM exemption, there is no need to differentiate between normal operations, startup and shutdown, and malfunction events in describing the general duty. Therefore, the language the EPA is proposing for 40 CFR §63.11173(h) does not include that language from 40 CFR 63.6(e)(1)(i). Section 63.6(e)(1)(ii) imposes requirements that are not necessary with the absence of an SSM exemption or are redundant with the general duty requirement being added at 40 CFR §63.11173(h). We are also proposing to revise the General Provisions table to 40 CFR part 63, subpart HHHHHH (Table 1)

entry for 40 CFR 63.6(f)(1) by changing the "yes" in column 3 to a "no." We have added language to the regulatory text at §63.11173(h) to specify that the standards apply at all times. Although, consistent with *Sierra Club*, the EPA amended 40 CFR 63.6(f)(1) (and also paragraph (h)(1)) on March 11, 2021, to reflect the court order and correct the CFR to remove the SSM exemption and is proposing to revise the description in column 2 of table 1 to clarify that this rule applies at all times, the second sentence of 40 CFR 63.6(f)(1) contains language that is premised on the existence of an exemption and is inapposite in the absence of the exemption. Thus, rather than cross-referencing 63.6(f)(1), we are adding the language of 63.6(f)(1) that requires compliance with standards at all times to the regulatory text at §63.11173(h).

C. What compliance dates are we proposing, and what is the rationale for the proposed compliance dates?

The EPA is proposing that affected sources must comply with all of the amendments no later than 180 days after the effective date of the final rule. All affected facilities would have to continue to meet the current requirements of 40 CFR part 63, subpart HHHHHH, until the applicable compliance date of the amended rule. The final action is not expected to be a "major rule" as defined by 5 U.S.C. 804(2), so the effective date of the final rule will be the promulgation date as specified in CAA section 112(d)(10).

For existing sources, we are proposing electronic reporting requirements that would impact ongoing compliance requirements for 40 CFR part 63, subpart HHHHHH. We are also acknowledging the change to the requirements for SSM that removed the exemption from the requirements to meet the standard during SSM periods. Our experience with similar industries that are required to employ electronic reporting shows that a time period of a minimum of 90 days, and, more typically, 180 days, is generally necessary to successfully accomplish these

revisions. Our experience with similar industries further shows that this sort of regulated facility generally requires a time period of 180 days to read and understand the amended rule requirements; to evaluate their operations to ensure that they can meet the standards during periods of startup and shutdown as defined in the rule and make any necessary adjustments; and to update their operation, maintenance, and monitoring plan to reflect the revised requirements. Thus, the EPA is proposing that existing affected sources be in compliance with all regulation's revised requirements within 180 days of the regulation's effective date.

We solicit comment on these proposed compliance periods, and we specifically request submission of information from sources in these source categories regarding specific actions that would need to be undertaken to comply with the proposed amended requirements and the time needed to make the adjustments for compliance with any of the revised requirements. We note that information provided may result in changes to the proposed compliance dates.

IV. Summary of Cost, Environmental, and Economic Impacts

A. What are the affected sources?

Currently, we estimate 39,812 area source facilities are subject to the Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources NESHAP and operating in the United States. The affected source under the NESHAP is the collection of all of the items listed in (1) through (6) of this section. Not all affected sources will have all of the items listed in (1) through (6) of this section.

(1) Mixing rooms and equipment;

(2) Spray booths, ventilated prep stations, curing ovens, and associated equipment;

(3) Spray guns and associated equipment;

(4) Spray gun cleaning equipment;

(5) Equipment used for storage, handling, recovery, or recycling of cleaning solvent or waste paint; and

(6) Equipment used for paint stripping at paint stripping facilities using paint strippers containing MeCl.

B. What are the air quality impacts?

Estimated emissions of target HAP and MeCl from the facilities in the Paint Stripping and Surface Coating source categories are not expected to change in any significant way due to this review or its associated amendments.

These proposed amendments acknowledge that all area sources in the source categories must comply with the relevant emission standards at all times, including periods of SSM. We were unable to quantify the emissions that occur during periods of SSM or the specific emissions reductions that would occur as a result of this action.

Indirect or secondary air emissions impacts are impacts that would result from the increased electricity usage associated with the operation of control devices (*e.g.,* increased secondary emissions of criteria pollutants from power plants). Energy impacts consist of the electricity and steam needed to operate control devices and other equipment. The proposed amendments would have no effect on the energy needs of the affected paint stripping and surface coating facilities and would, therefore, have no indirect or secondary air emissions impacts.

C. What are the cost impacts?

We estimate that each facility in the source categories will experience costs of approximately $400. These costs are a combination of the estimated reporting and recordkeeping costs (2 technical hours), and the time to read and understand the rule amendments (2 technical

hours).[16] Costs associated with adoption of electronic reporting were estimated as part of the reporting and recordkeeping costs and include time for sources to familiarize themselves with electronic record systems.

For further information on the potential costs, see the memorandum titled *Proposal Economic Impact Analysis for the National Emissions Standards of Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources*, available in the docket for this action.

D. What are the economic impacts?

The economic impact analysis is designed to inform decision makers about the potential economic consequences of a regulatory action. For the current proposals, the EPA estimated the cost of becoming familiar with the rule, re-evaluating previously developed SSM record systems, and transitioning to electronic reporting. To assess the maximum potential impact, the largest cost expected to be experienced in any one year is compared to the total sales for the ultimate owner of the affected facilities to estimate the total burden for each facility.

For the proposed revisions to the Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources NESHAP, the total cost is estimated to be approximately $400 per facility in the first year of the rule. These costs are not expected to result in a significant market impact, regardless of whether they are passed on to the purchaser or absorbed by the firms.

The EPA also prepared a small business screening assessment to determine whether any of the identified affected entities are small entities, as defined by the U.S. Small Business

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[16] The labor costs were calculated using the applicable labor rates from the latest version of the Bureau of Labor Statistics (BLS) survey titled National Occupational Employment and Wage Estimates United States located at: *https://www.bls.gov/oes/current/oes_nat.htm#00-0000*.

Administration. Of the facilities potentially affected by the proposed revisions to the Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources NESHAP, we estimate that the vast majority are small entities. However, the annualized costs associated with the proposed requirement is from 0.0 to 0.2 percent of annual sales revenue for the ultimate owner of those facilities, well below the 1 percent threshold. Therefore, there are no significant economic impacts on a substantial number of small entities from these proposed amendments.

E. What are the benefits?

As stated above in section IV.B. of this preamble, we were unable to quantify the specific emissions reductions associated with eliminating the SSM exemption.

Because these proposed amendments are not considered economically significant, as defined by Executive Order 12866, we did not monetize the benefits of reducing these emissions. This does not mean that there are no benefits associated with the potential reduction in target HAP and MeCl from this rule.

F. What analysis of environmental justice did we conduct?

Executive Order 12898 directs the EPA to identify the populations of concern who are most likely to experience unequal burdens from environmental harms; specifically, minority populations, low-income populations, and indigenous peoples (59 FR 7629, February 16, 1994). Additionally, Executive Order 13985 was signed to advance racial equity and support underserved communities through Federal government actions (86 FR 7009, January 20, 2021). The EPA defines environmental justice (EJ) as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The EPA further defines the term fair treatment to mean that "no group of people should bear a

disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies" (*https://www.epa.gov/environmentaljustice)*. In recognizing that minority and low-income populations often bear an unequal burden of environmental harms and risks, the EPA continues to consider ways of protecting them from adverse public health and environmental effects of air pollution. To examine the potential for any EJ issues that might be associated with the source categories, we performed a demographic analysis, which is an assessment of individual demographic groups of the populations living within 5 kilometers (km) and within 50 km of the facilities. The EPA then compared the data from this analysis to the national average for the demographic indicators.

In the analysis, we evaluated the proximity of minority and low-income groups within the populations that live near facilities. Data limitations preclude a complete analysis. This NESHAP applies to sources in many different industries, often operating as small facilities, and limited location data of subject facilities was available. As described in the technology review memo, available in the docket for this action, and section II.C of this preamble, we did conduct searches for available information. However, below results do not account for emission or risk impacts from sources and may not be fully representative of the full distribution of facilities across all locations and populations. This analysis is intended to function as a guide to possible proximity disparities.

Based on the fact that there are over 3,000 facilities in this analysis, and their proximity to urban centers, the source categories' minority demographics are higher than the national average while individual facilities for a large number of sites will significantly exceed the national average demographics for every group due to being located in urban locations. The

results of the demographic analysis for populations within 5 km of the facilities within the source categories indicate that the minority population (being the total population minus the white population) is higher when compared to the national percentage (49 percent versus 40 percent). These comparisons also hold true for other demographic groups (African American, Other and Multiracial Groups, Hispanics, and people living in linguistic isolation). The African American demographic group shows the highest difference when compared to the national average (17 percent vs 12 percent). The remaining demographics identified above were above the national average by 2 percent. The methodology and the results of the demographic analysis are presented in a technical report, *Technology Review— Analysis of Demographic Factors for Populations Living Near the Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources Source Categories*, available in this docket for this action (Document ID EPA–HQ–OAR–2021–0016). While demographic analysis shows some population categories that are above the national average, this action is not likely to change levels of emissions near facilities. Based on our technology review, we did not identify any add-on control technologies, process equipment, work practices or procedures that were not previously considered during development of the 2008 Paint Stripping and Miscellaneous Surface Coating at Area Sources NESHAP, and we did not identify developments in practices, processes, or control technologies that would result in additional emission reductions.

V. Request for Comments

The EPA requests comment on all aspects of this proposal, including options for reducing emissions that the EPA may not have considered, as well as information that may improve the Agency's understanding of this source category and inform future actions. Among other things, the EPA requests comment on any new add-on control technologies, process equipment,

management practices or procedures not previously identified, including information on the availability, costs, feasibility, and efficacy of such measures. The EPA also requests comment on the availability, cost, and applicability of viable substitutes for methylene chloride for automotive refinishing and aerospace parts manufacturing uses. In addition, the EPA requests data or estimates of emissions from facilities in this source category, including information on how emissions, exposures, and potential controls may differ between the different types of sources covered in this rule (such as differences among types or sizes of automotive refinishing sites, and differences between automotive refinishing and aerospace parts manufacturing sites). Section VI of this preamble provides more information on submitting data.

VI. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at *https://www.epa.gov/laws-regulations/laws-and-executive-orders.*

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

This action is not a significant regulatory action and was, therefore, not submitted to OMB for review.

B. Paperwork Reduction Act (PRA)

The information collection activities in this proposal have been submitted for approval to OMB under the PRA.

The Information Collection Request (ICR) document that the EPA prepared has been assigned EPA ICR number 2268.07. You can find a copy of the ICR in the docket for this action (Docket ID No. EPA-HQ-OAR-2021-0016), and it is briefly summarized here.

As part of the technology review for the NESHAP, the EPA is not proposing to revise the emission limit requirements. The EPA is acknowledging revisions to the SSM provisions that previously applied to the NESHAP and is proposing the use of electronic data reporting for future notifications and reports. This information is being collected to assure compliance with 40 CFR part 63, subpart HHHHHH.

Respondents/affected entities: Facilities performing paint stripping and surface coating operations at area sources.

Respondent's obligation to respond: Mandatory (40 CFR part 63, subpart HHHHHH).

Estimated number of respondents: In the 3 years after the amendments are final, approximately 39,812 respondents per year would be subject to the NESHAP and no additional respondents are expected to become subject to the NESHAP during that period.

Frequency of response: The total number of responses in year 1 is 76,388. Years 2 and 3 would have no responses.

Total estimated burden: The average annual burden to the paint stripping and surface coating operations at area source facilities over the 3 years if the amendments are finalized is estimated to be 43,900 hours (per year). The average annual burden to the Agency over the 3 years after the amendments are final is estimated to be 0 hours (per year). Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: The average annual cost to the facilities is $5,200,000 in labor costs for the first 3 years after the amendments are final. The average annual capital and operation and maintenance (O&M) costs is -$27,100. The total average annual Agency cost over the first 3 years after the amendments are final is estimated to be $0.

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

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. The economic impact associated with the proposed requirements in this action for the affected small entities is described in section IV.D. above.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments.

The EPA has determined, based on discussions with state, local, and tribal governments during site visits during the original rule development, that this rule does not contain a Federal mandate that may result in expenditures of $100 million or more for state, local, and tribal governments, in the aggregate, or the private sector in any one year. Thus, the proposed rule is not subject to the requirements of sections 202 and 205 of the UMRA.

Some state, local, or tribal governments have paint stripping and/or surface coating operations (*e.g.*, municipal fleet vehicle maintenance garages) that may be subject to the requirements of this proposed rule. However, we do not believe that any of them are operated by small government entities. Small government entities are expected to contract for refinishing services when these services are needed, rather than doing this work in-house. In addition, total expenditures for all entities to comply with the proposed rule are estimated to be less than $100 million in any year.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

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

This action does not have tribal implications as specified in Executive Order 13175. No tribal facilities are known to be engaged in any of the industries that would be affected by this action. Thus, Executive Order 13175 does not apply to this action.

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

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because the EPA does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children.

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

This action is not subject to Executive Order 13211 because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act (NTTAA) and 1 CFR Part 51

This rulemaking involves technical standards. We are proposing to amend the Paint Stripping and Miscellaneous Surface Coating Operations at Area Source NESHAP in this action to update references to ASHRAE Method 52.1, "Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter, June 4, 1992, with ANSI/ASHRAE Standard 52.2-2017 Method of Testing General Ventilation

Air-Cleaning Devices for Removal Efficiency by Particle Size. Both methods measure paint booth filter efficiency to measure the capture efficiency of paint overspray arrestors with spray-applied coatings. The EPA is also proposing to include EPA Method 319—Determination of Filtration Efficiency for Paint Overspray Arrestors (Appendix A to 40 CFR part 63), as an alternative to ANSI/ASHRAE Standard 52.2-2017.

The ANSI/ASHRAE standard is available from the American Society of Heating, Refrigerating and Air-Conditioning Engineers 1791 Tullie Circle NE, Atlanta, GA 30329. See *www.ashrae.org*.

Under 40 CFR 63.7(f) and 40 CFR 63.8(f) of subpart A of the General Provisions, a source may apply to the EPA for permission to use alternative test methods or alternative monitoring requirements in place of any required testing methods, performance specifications, or procedures in the final rule or any amendments.

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

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

The EPA believes that this action does not have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, and/or indigenous peoples, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994). The methodology and the results of the demographic analysis are presented in a technical report, *Technology Review — Analysis of Demographic Factors for Populations Living Near the Paint*

Stripping and Miscellaneous Surface Coating Operations at Area Sources Source Categories, available in this docket for this action (Document ID EPA–HQ–OAR–2021–0016).

List of Subjects in 40 CFR Part 63

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

Dated: XXXX, 2021.

Michael S. Regan,

Administrator.

6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[EPA-HQ-OAR-2021-0317; FRL-8510-02-OAR]

RIN 2060-AV16

Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: This notice comprises three distinct groups of actions under the Clean Air Act (CAA) which are collectively intended to significantly reduce emissions of greenhouse gases (GHGs) and other harmful air pollutants from the Crude Oil and Natural Gas source category. First, the EPA proposes to revise the new source performance standards (NSPS) for GHGs and volatile organic compounds (VOCs) for the Crude Oil and Natural Gas source category under the CAA to reflect the Agency's most recent review of the feasibility and cost of reducing emissions from these sources. Second, the EPA proposes emissions guidelines (EG) under the CAA, for states to follow in developing, submitting, and implementing state plans to establish performance standards to limit GHGs from existing sources (designated facilities)[1] in the Crude Oil and Natural Gas source category. Third, the EPA is taking several related actions stemming from the joint resolution of Congress, adopted on June 30, 2021 under the Congressional Review Act

[1] The term ''designated facility'' means ''any existing facility which emits a designated pollutant and which would be subject to a standard of performance for that pollutant if the existing facility were an affected facility.'' See 40 CFR 60.21a(b).

(CRA), disapproving the EPA's final rule titled, "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review," 85 FR 57018 (Sept. 14, 2020) ("2020 Policy Rule"). This proposal responds to the President's January 20, 2021, Executive Order (EO) 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis," which directed the EPA to consider taking the actions proposed here.

DATES: *Comments*. Comments must be received on or before **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Under the Paperwork Reduction Act (PRA), comments on the information collection provisions are best assured of consideration if the Office of Management and Budget (OMB) receives a copy of your comments on or before **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

Public hearing: The EPA will hold a virtual public hearing on **[INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** and **[INSERT DATE 16 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. See **SUPPLEMENTARY INFORMATION** for information on the hearing.

ADDRESSES: You may send comments, identified by Docket ID No. EPA-HQ-OAR-2021-0317 by any of the following methods:

- Federal eRulemaking Portal: *https://www.regulations.gov/* (our preferred method). Follow the online instructions for submitting comments.
- Email: *a-and-r-docket@epa.gov*. Include Docket ID No. EPA-HQ-OAR-2021-0317 in the subject line of the message.

- Fax: (202) 566-9744. Attention Docket ID No. EPA-HQ-OAR-2021-0317.
- Mail: U.S. Environmental Protection Agency, EPA Docket Center, Docket ID No. EPA-HQ-OAR-2021-0317, Mail Code 28221T, 1200 Pennsylvania Avenue, NW, Washington, DC 20460.
- Hand/Courier Delivery: EPA Docket Center, WJC West Building, Room 3334, 1301 Constitution Avenue, NW, Washington, DC 20004. The Docket Center's hours of operation are 8:30 a.m. – 4:30 p.m., Monday – Friday (except Federal holidays).

Instructions: All submissions received must include the Docket ID No. for this rulemaking. Comments received may be posted without change to *https://www.regulations.gov/*, including any personal information provided. For detailed instructions on sending comments and additional information on the rulemaking process, see the "Public Participation" heading of the **SUPPLEMENTARY INFORMATION** section of this document. Out of an abundance of caution for members of the public and our staff, the EPA Docket Center and Reading Room are closed to the public, with limited exceptions, to reduce the risk of transmitting COVID-19. Our Docket Center staff will continue to provide remote customer service via email, phone, and webform. We encourage the public to submit comments via *https://www.regulations.gov/* or email, as there may be a delay in processing mail and faxes. Hand deliveries and couriers may be received by scheduled appointment only. For further information on EPA Docket Center services and the current status, please visit us online at *https://www.epa.gov/dockets*.

FOR FURTHER INFORMATION CONTACT: For questions about this proposed action, contact Ms. Karen Marsh, Sector Policies and Programs Division (E143-05), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle

Park, North Carolina 27711; telephone number: (919) 541-1065; fax number: (919) 541-0516; and email address: *marsh.karen@epa.gov* or Ms. Amy Hambrick, Sector Policies and Programs Division (E143–05), Office of Air Quality Planning and Standards, Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number: (919) 541–0964; facsimile number: (919) 541–3470; email address: *hambrick.amy@epa.gov*.

SUPPLEMENTARY INFORMATION:

Participation in virtual public hearing. Please note that the EPA is deviating from its typical approach for public hearings, because the President has declared a national emergency. Due to the current Centers for Disease Control and Prevention (CDC) recommendations, as well as state and local orders for social distancing to limit the spread of COVID-19, the EPA cannot hold in-person public meetings at this time.

The public hearing will be held via virtual platform on **[INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, and **[INSERT DATE 16 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, and will convene at 11:00 a.m. Eastern Time (ET) and conclude at 9:00 p.m. ET each day. On each hearing day, the EPA may close a session 15 minutes after the last pre-registered speaker has testified if there are no additional speakers.The EPA will announce further details at *https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry*. If the EPA receives a high volume of registrations for the public hearing, we may continue the public hearing on **[INSERT DATE 17 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The EPA does not intend to publish a document in the *Federal Register* announcing the potential addition of a third day for the public hearing or any other updates to the

information on the hearing described in this document. Please monitor *https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry* for any updates to the information described in this document, including information about the public hearing. For information or questions about the public hearing, please contact the public hearing team at (888) 372-8699 or by email at *SPPDpublichearing@epa.gov*.

The EPA will begin pre-registering speakers for the hearing upon publication of this document in the *Federal Register*. The EPA will accept registrations on an individual basis. To register to speak at the virtual hearing, follow the directions at *https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry* or contact the public hearing team at (888) 372-8699 or by email at *SPPDpublichearing@epa.gov*. The last day to pre-register to speak at the hearing will be **[INSERT DATE 9 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Prior to the hearing, the EPA will post a general agenda that will list pre-registered speakers in approximate order at: *https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry*.

The EPA will make every effort to follow the schedule as closely as possible on the day of the hearing; however, please plan for the hearings to run either ahead of schedule or behind schedule.

Each commenter will have 5 minutes to provide oral testimony. The EPA encourages commenters to provide the EPA with a copy of their oral testimony electronically (via email) by emailing it to *marsh.karen@epa.gov* and *hambrick.amy@epa.gov*. The EPA also recommends submitting the text of your oral testimony as written comments to the rulemaking docket.

The EPA may ask clarifying questions during the oral presentations but will not respond to the presentations at that time. Written statements and supporting information submitted during the comment period will be considered with the same weight as oral testimony and supporting information presented at the public hearing.

If you require the services of an interpreter or a special accommodation such as audio description, please pre-register for the hearing with the public hearing team and describe your needs by **[INSERT DATE 7 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The EPA may not be able to arrange accommodations without advanced notice.

Docket. The EPA has established a docket for this rulemaking under Docket ID No. EPA-HQ-OAR-2021-0317. All documents in the docket are listed in *https://www.regulations.gov/*. Although listed, some information is not publicly available, *e.g.*, Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy. With the exception of such material, publicly available docket materials are available electronically in *https://www.regulations.gov/*.

Instructions. Direct your comments to Docket ID No. EPA-HQ-OAR-2021-0317. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *https://www.regulations.gov/*, including any personal information provided, unless the comment includes information claimed to be CBI or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *https://www.regulations.gov/* or email. This type of information should be submitted by mail as discussed below.

The EPA may publish any comment received to its public docket. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (*i.e.*, on the Web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit *https://www.epa.gov/dockets/commenting-epa-dockets*.

The *https://www.regulations.gov/* website allows you to submit your comment anonymously, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through *https://www.regulations.gov/*, your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any digital storage media you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should not include special characters or any form of encryption and be free of any defects or viruses. For additional information about the EPA's public docket, visit the EPA Docket Center homepage at *https://www.epa.gov/dockets*.

The EPA is temporarily suspending its Docket Center and Reading Room for public visitors, with limited exceptions, to reduce the risk of transmitting COVID-19. Our Docket

Center staff will continue to provide remote customer service via email, phone, and webform. We encourage the public to submit comments via *https://www.regulations.gov/* as there may be a delay in processing mail and faxes. Hand deliveries or couriers will be received by scheduled appointment only. For further information and updates on EPA Docket Center services, please visit us online at *https://www.epa.gov/dockets*.

The EPA continues to carefully and continuously monitor information from the CDC, local area health departments, and our Federal partners so that we can respond rapidly as conditions change regarding COVID-19.

Submitting CBI. Do not submit information containing CBI to the EPA through *https://www.regulations.gov/* or email. Clearly mark the part or all of the information that you claim to be CBI. For CBI information on any digital storage media that you mail to the EPA, mark the outside of the digital storage media as CBI and then identify electronically within the digital storage media the specific information that is claimed as CBI. In addition to one complete version of the comments that includes information claimed as CBI, you must submit a copy of the comments that does not contain the information claimed as CBI directly to the public docket through the procedures outlined in *Instructions* above. If you submit any digital storage media that does not contain CBI, mark the outside of the digital storage media clearly that it does not contain CBI. Information not marked as CBI will be included in the public docket and the EPA's electronic public docket without prior notice. Information marked as CBI will not be disclosed except in accordance with procedures set forth in 40 CFR part 2. Send or deliver information identified as CBI only to the following address: OAQPS Document Control Officer (C404-02), OAQPS, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711,

Attention Docket ID No. EPA-HQ-OAR-2021-0317. Note that written comments containing CBI submitted by mail may be delayed and no hand deliveries will be accepted.

Preamble acronyms and abbreviations. We use multiple acronyms and terms in this preamble. While this list may not be exhaustive, to ease the reading of this preamble and for reference purposes, the EPA defines the following terms and acronyms here:

ACE	Affordable Clean Energy rule
AEO	Annual Energy Outlook
AMEL	alternate means of emissions limitation
ANGA	American Natural Gas Alliance
ANSI	American National Standards Institute
APCD	air pollution control devices
API	American Petroleum Institute
ARPA-E	Advanced Research Projects Agency-Energy
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AVO	audio, visual, olfactory
BACT	best achievable control technology
BOEM	Bureau of Ocean Energy Management
BLM	Bureau of Land Management
BMP	best management practices
boe	barrels of oil equivalents
BSER	best system of emission reduction
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAA	Clean Air Act
CBI	Confidential Business Information
CDC	Center for Disease Control
CDX	EPA's Central Data Exchange
CEDRI	Compliance and Emissions Data Reporting Interface
CFR	Code of Federal Regulations
CH_4	methane
cm	centimeter
CPI	consumer price index
CPI-U	consumer price index urban
CO	carbon monoxide
COPD	chronic obstructive pulmonary disease
CO_2	carbon dioxide
CO_2 Eq.	carbon dioxide equivalent
COA	condition of approval
COS	carbonyl sulfide

CRA	Congressional Review Act
CS_2	carbon disulfide
CVS	closed vent systems
DC	direct current
DOE	Department of Energy
DOI	Department of the Interior
DOT	Department of Transportation
EAV	equivalent annualized value
EDF	Environmental Defense Fund
EG	emission guidelines
ECOS	Environmental Council of the States
EGU	electricity generating units
EIA	U.S. Energy Information Administration
EJ	environmental justice
EO	Executive Order
EPA	Environmental Protection Agency
ERT	Electronic Reporting Tool
FERC	The U.S. Federal Energy Regulatory Commission
fpm	feet per minute
GC	gas chromatograph
GHGs	greenhouse gases
GHGI	Inventory of U.S. Greenhouse Gas Emissions and Sinks
GHGRP	Greenhouse Gas Reporting Program
GRI	Gas Research Institute
GWP	global warning potential
HAP	hazardous air pollutant(s)
HC	hydrocarbons
HFC	hydrofluorocarbons
H_2S	hydrogen sulfide
ICR	Information Collection Request
IOGCC	Interstate Oil and Gas Compact Commission
IPCC	Intergovernmental Panel on Climate Change
IR	infrared
IRFA	initial regulatory flexibility analysis
kt	kilotons
kg	kilograms
low-e	low emission
LDAR	leak detection and repair
Mcf	thousand cubic feet
MMT	million metric tons
MRR	monitoring, recordkeeping, and reporting
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System

NCA4	2017-2018 Fourth National Climate Assessment
NEI	National Emissions Inventory
NEMS	National Energy Modeling System
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NGL	natural gas liquid
NGO	non-governmental organization
NOAA	National Oceanic and Atmospheric Administration
NOx	nitrogen oxides
NSPS	new source performance standards
NTTAA	National Technology Transfer and Advancement Act
OCSLA	The Outer Continental Shelf Lands Act
OAQPS	Office of Air Quality Planning and Standards
OIG	Office of the Inspector General
OGI	optical gas imaging
OMB	Office of Management and Budget
PE	professional engineer
PFCs	perfluorocarbons
PHMSA	Pipeline and Hazardous Materials Safety Administration
PM	particulate matter
$PM_{2.5}$	PM with a diameter of 2.5 micrometers or less
ppb	parts per billion
ppm	parts per million
PRA	Paperwork Reduction Act
PRD	pressure release device
PRV	pressure release valve
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PTE	potential to emit
PV	present value
REC	reduced emissions completion
RFA	Regulatory Flexibility Act
RIA	Regulatory Impact Analysis
RTC	response to comments
SBAR	Small Business Advocacy Review
$SC\text{-}CH_4$	social cost of methane
SCF	significant contribution finding
scf	standard cubic feet
scfh	standard cubic feet per hour
scfm	standard cubic feet per minute
SF_6	sulfur hexafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
tpy	tons per year

D.C. Circuit	U.S. Court of Appeals for the District of Columbia Circuit
TAR	Tribal Authority Rule
TIP	Tribal Implementation Plan
TSD	technical support document
TTN	Technology Transfer Network
UAS	unmanned aircraft systems
UIC	underground injection control
UMRA	Unfunded Mandates Reform Act
U.S.	United States
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geologic Survey
VCS	Voluntary Consensus Standards
VOC	volatile organic compounds
VRD	vapor recovery device
VRU	vapor recovery unit

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I. Executive Summary

A. Purpose of the Regulatory Action

This proposed rulemaking takes a significant step forward in mitigating climate-

destabilizing pollution and protecting human health by reducing GHG and VOC emissions from the Oil and Natural Gas Industry,[2] specifically the Crude Oil and Natural Gas source category.[3] The Oil and Natural Gas Industry is the United States' largest industrial emitter of methane, a highly potent GHG. Human activity-related emissions of methane are responsible for about one third of the warming due to well-mixed GHGs and constitute the second most important warming agent arising from human activity after carbon dioxide (a well-mixed gas is one with an atmospheric lifetime longer than a year or two, which allows the gas to be mixed around the world, meaning that the location of emission of the gas has little importance in terms of its impacts). According to the Intergovernmental Panel on Climate Change (IPCC), strong, rapid, and sustained methane reductions are critical to reducing near-term disruption of the climate system and are a vital complement to reductions in other GHGs that are needed to limit the long-term extent of climate change and its destructive impacts. The Oil and Natural Gas Industry also emits other harmful pollutants in varying concentrations and amounts, including carbon dioxide (CO_2), VOC, sulfur dioxide (SO_2), nitrogen oxide (NOx), hydrogen sulfide (H_2S), carbon disulfide (CS_2), and carbonyl sulfide (COS), as well as benzene, toluene, ethylbenzene, and

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[2] The EPA characterizes the Oil and Natural Gas Industry operations as being generally composed of four segments: (1) extraction and production of crude oil and natural gas ("oil and natural gas production"), (2) natural gas processing, (3) natural gas transmission and storage, and (4) natural gas distribution.

[3] The EPA defines the Crude Oil and Natural Gas source category to mean (1) crude oil production, which includes the well and extends to the point of custody transfer to the crude oil transmission pipeline or any other forms of transportation; and (2) natural gas production, processing, transmission, and storage, which include the well and extend to, but do not include, the local distribution company custody transfer station. For purposes of this proposed rulemaking, for crude oil, the EPA's focus is on operations from the well to the point of custody transfer at a petroleum refinery, while for natural gas, the focus is on all operations from the well to the local distribution company custody transfer station commonly referred to as the "city-gate".

xylenes (this group is commonly referred to as ''BTEX''), and n-hexane.

Under the authority of CAA section 111, this rulemaking proposes comprehensive standards of performance for GHG emissions (in the form of methane limitations) and VOC emissions for new, modified, and reconstructed sources in the Crude Oil and Natural Gas source category, including the production, processing, transmission and storage segments. For designated facilities, this rulemaking proposes EG containing presumptive standards for GHG in the form of methane limitations. When finalized, States shall utilize these EG to submit to the EPA plans that establish standards of performance for designated facilities and provide for implementation and enforcement of such standards. The EPA will provide support for States in developing their plans to reduce methane emissions from designated facilities within the Crude Oil and Natural Gas source category.

The EPA is proposing these actions in accordance with its legal obligations and authorities following a review directed by EO 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis," issued on January 20, 2021. The EPA intends for these proposed actions to address the far-reaching harmful consequences and real economic costs of climate change. According to the IPCC AR6 assessment, "It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred." The IPCC AR6 assessment states these changes have led to increases in heat waves and wildfire weather, reductions in air quality, more intense hurricanes and rainfall events, and rising sea level. These changes, along with future projected changes, endanger the physical survival, health, economic well-being, and quality of life of people living in the United States (U.S.), especially those in the

most vulnerable communities.

Methane is both the main component of natural gas and a potent GHG. One ton of methane in the atmosphere has 80 times the warming impact of a ton of CO_2, and contributes to the creation of ground-level ozone which is another greenhouse gas. Because methane has a shorter lifetime than CO_2, it has a smaller relative impact – although still significantly greater than CO_2 – when considering longer time periods. One standard metric is the 100-year global warming potential (GWP), which is a measure of the climate impact of emissions of one ton a greenhouse gas over 100 years relative to the impact of the emissions of one ton of CO_2. Even over this long timeframe, methane has a 100-year GWP of almost 30. The IPCC AR6 assessment found that "Over time scales of 10 to 20 years, the global temperature response to a year's worth of current emissions of SLCFs (short lived climate forcer) is at least as large as that due to a year's worth of CO_2 emissions."[4] The IPCC estimated that, depending on the reference scenario, collective reductions in these SLCFs (methane, ozone precursors, and HFCs) could reduce warming by 0.2 degrees Celsius (°C) (more than one-third of a degree Fahrenheit (°F) in 2040 and 0.8°C (almost 1.5°F) by the end of the century, which is important in the context of keeping warming to well below 2°C (3.6°F). As methane is the most important SLCF, this makes methane mitigation one of the best opportunities for reducing near term warming. Emissions from human activities have already more than doubled atmospheric methane concentrations since 1750, and that concentration has been growing larger at record rates in recent years.[5] In the

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[4] However, the IPCC AR6 assessment cautioned that "The effects of the SLCFs decay rapidly over the first few decades after pulse emission. Consequently, on time scales longer than about 30 years, the net long-term temperature effects of sectors and regions are dominated by CO_2."
[5] Naik, V., S. Szopa, B. Adhikary, P. Artaxo, T. Berntsen, W. D. Collins, S. Fuzzi, L. Gallardo,

absence of additional reduction policies, methane emissions are projected to continue rising through at least 2040.

Methane's radiative efficiency means that immediate reductions in methane emissions, including from sources in the Crude Oil and Natural Gas source category, can help reduce near-term warming. As natural gas is comprised primarily of methane, every natural gas leak, or intentional release of natural gas through venting or other processes, constitutes a release of methane. Reducing human-caused methane emissions, such as controlling natural gas leaks and releases as proposed in these actions, would contribute substantially to global efforts to limit temperature rise, aiding efforts to remain well below 2°C above pre-industrial levels. See preamble section III for further discussion on the Crude Oil and Natural Gas Emissions and Climate Change, including discussion of the GHGs, VOCs and SO_2 Emissions on Public Health and Welfare.

Methane and VOC emissions from the Crude Oil and Natural Gas source category result from a variety of industry operations across the supply chain. As natural gas moves through the necessarily interconnected system of exploration, production, storage, processing, and transmission that brings it from wellhead to commerce, emissions primarily result from intentional venting, unintentional gas carry-through (*e.g.*, vortexing from separator drain, improper liquid level settings, liquid level control valve on an upstream separator or scrubber

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A. Kiendler 41 Scharr, Z. Klimont, H. Liao, N. Unger, P. Zanis, 2021, Short-Lived Climate Forcers. In: Climate Change 42 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the 43 Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. 44 Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. 45 Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Cambridge University 46 Press. In Press.

does not seat properly at the end of an automated liquid dumping event, inefficient separation of gas and liquid phases occurs upstream of tanks allowing some gas carry-through), routine maintenance, unintentional fugitive emissions, flaring, malfunctions, abnormal process conditions, and system upsets. These emissions are associated with a range of specific equipment and practices, including leaking valves, connectors, and other components at well sites and compressor stations; leaks and vented emissions from storage vessels; releases from natural gas-driven pneumatic pumps and controllers; liquids unloading at well sites; and venting or under-performing flaring of associated gas from oil wells. But technical innovations have produced a range of technologies and best practices to monitor, eliminate or minimize these emissions, which in many cases have the benefit of reducing multiple pollutants at once and recovering saleable product. These technologies and best practices have been deployed by individual oil and natural gas companies, required by State regulations, or reflected in regulations issued by the EPA and other Federal agencies.

In this action, the EPA has taken a comprehensive analysis of the available data from emission sources in the Crude Oil and Natural Gas source category and the latest available information on control measures and techniques to identify achievable, cost-effective measures to significantly reduce emissions, consistent with the requirements of section 111 of the CAA. If finalized and implemented, the actions proposed in this rulemaking would lead to significant and cost-effective reductions in climate and health-harming pollution and encourage development and deployment of innovative technologies to further reduce this pollution in the Crude Oil and Natural Gas source category. The actions proposed in this rulemaking would:

- Update, strengthen, and expand current requirements under CAA section 111(b) for methane and VOC emissions from new, modified, and reconstructed facilities,
- establish new limits for methane, and VOC emissions from new, modified, and reconstructed facilities that are not currently regulated under CAA section 111(b),
- establish the first nationwide EG for States to limit methane pollution from existing designated facilities in the source category under CAA section 111(d), and
- take comment on additional sources of pollution that, with understanding gained from more information, may offer opportunities for emission reductions, which the EPA would present in a supplemental rulemaking proposal under both CAA section 111(b) and (d).

In developing this proposal, the EPA drew on its own prior experience in regulating sources in the Crude Oil and Natural Gas source category under section 111 and other CAA programs; applied lessons learned from States' regulatory efforts, the emission reduction efforts of leading companies, and the EPA's long-standing voluntary emission reduction programs; and reviewed the latest available information about new and developing technologies, as well as, peer-reviewed research from emission measurement campaigns across the U.S.. Further, the EPA undertook extensive pre-proposal outreach to the public and to stakeholders, including three full days of public listening sessions, roundtables with State energy and environmental regulators, a two-day workshop on innovative methane detection technologies, and a nonregulatory docket established in May 2021 to receive written comments. Through this outreach, the EPA heard from diverse voices and perspectives including State and local governments, Tribal nations,

communities affected by oil and gas pollution, environmental and public health organizations, and representatives of the oil and natural gas industry, all of which provided ideas and information that helped shape and inform this proposal.

The EPA also considered community and environmental justice implications in the development of this proposal and sought to ensure equitable treatment and meaningful involvement of all people regardless of race, color, national origin, or income in the process. The EPA engaged and consulted representatives of frontline communities that are directly affected by and particularly vulnerable to the climate and health impacts of pollution from this source category through interactions such as webinars, listening sessions and meetings. These opportunities allowed the EPA to hear directly from the public, especially overburdened and underserved communities, on the development of the proposed rule and to factor these concerns into this proposal. For example, in addition to establishing EG that extend fugitive emission requirements to existing oil and natural gas facilities, the EPA is proposing to expand leak detection programs already in effect for new sources to include known sources of large emission events and proposing to require more frequent monitoring at sites with more emissions. The EPA is also taking comment on innovative mechanisms to ensure compliance and minimize emissions, including the possibility of providing a pathway for communities to detect and report large emitting events that may require follow-up and mitigation by owners and operators. The extensive pollution reduction measures in this proposal, if finalized, would collectively reduce a suite of harmful pollutants and their associated health impacts in communities adjacent to these emission sources. Further, to help ensure that the needs and perspectives of communities with environmental justice concerns are considered as States develop plans to establish and implement

standards of performance for existing sources, the EPA is proposing to require that States demonstrate they have undertaken meaningful outreach and engagement with overburdened and underserved communities as part of their State plan submissions under the EPA. A full discussion of the Environmental Justice Considerations, Implications, and Stakeholder Outreach can be found in section VI of the preamble. A full discussion of Other Stakeholder Outreach is found in section VII of the preamble.

As described in more detail below, the EPA recognizes that several States and other Federal agencies currently regulate the Oil and Natural Gas Industry. The EPA also recognizes that these State and other Federal agency regulatory programs have matured since the EPA began implementing the current NSPS requirements in 2012 and 2016. The EPA further acknowledges the technical innovations that the Oil and Natural Gas Industry has made during the past decade; this industry operates at a fast pace and changes constantly as technology evolves. The EPA commends these efforts and recognizes States for their innovative standards, alternative compliance options, and implementation strategies, and intends these proposed actions to build upon progress made by certain States and Federal agencies in reducing GHG and VOC emissions. See preamble section V for fuller discussion of Related State Actions and Other Federal Actions Regulating Oil and Natural Gas Sources and Industry and Voluntary Actions to Address Climate Change.

The EPA believes that a broad ensemble of mutually leveraging efforts across all States and all Federal agencies is essential to meaningfully address climate change effectively. As the Federal agency with primary responsibility to protect human health and the environment, the EPA has the unique responsibility and authority to regulate harmful air pollutants emitted by the

Crude Oil and Natural Gas source category. The EPA recognizes that States and other Federal agencies regulate in accordance with their respective legal authorities and within their respective jurisdictions but collectively do not fully and consistently address the range of sources and emission reduction measures contained in this proposal. Direct Federal regulation of methane from new, reconstructed, and modified sources in this category, combined with approved State plans that are consistent with the EPA's presumptive standards for designated facilities (existing sources), will help reduce both climate- and other health-harming pollution from a large number of sources that are either unregulated or from which additional, cost-effective reductions are available, level the regulatory playing field, and help promote technological innovation.

Throughout this action, unless noted otherwise, the EPA is requesting comments on all aspects of the proposal to enable the EPA to develop a final rule that, consistent with our responsibilities under section 111 of the CAA, achieves the greatest possible reductions in methane and VOC emissions while remaining achievable, cost effective, and conducive to technological innovation. As a further step in the rulemaking process and to solicit additional public input, the EPA plans to issue a supplemental proposal and supplemental RIA for the supplemental proposal to provide regulatory text for the proposed NSPS OOOOb and EG OOOOc. In light of certain innovative elements of this proposed rule and the EPA's request for information that would support the regulation of additional sources in the Crude Oil and Natural Gas source category as part of this rulemaking, the EPA is considering including additional provisions in this supplemental proposal and RIA based on information and comment collected in response to this notice.

As noted later in this preamble, the supplemental proposal may address, among other

issues: (1) Ways to mitigate methane from abandoned wells, (2) measures to reduce emissions from pipeline pigging operations and other pipeline blowdowns, (3) ways to minimize emissions from tank truck loading operations, and (4) ways to strengthen requirements to ensure proper operation and optimal performance of control devices. In addition, and as noted in the solicitations of comment in this notice, the supplemental proposal may revisit and refine certain provisions of this proposal in response to information provided by the public. For instance, the EPA is seeking input on multiple aspects of the proposed approach for fugitive emissions monitoring at well sites, including the baseline emission threshold and other criteria (such as the presence of specific types of malfunction-prone equipment) that should be used to determine whether a well site is required to undertake ongoing fugitive emissions monitoring; the methodology for calculating baseline methane emissions and whether it should account for malfunctions or improper operation of controls at storage vessels; and ways to ensure that emissions from wells owned by small businesses are addressed while still recognizing the greater challenges that small businesses with less dedicated staff and resources for environmental compliance may have. The EPA is also seeking input on ways to ensure that captured associated gas is collected for a useful purpose rather than flared, and the feasibility of requiring broader use of zero-emitting technology for pneumatic pumps.

Finally, the EPA is seeking comment and information on alternative measurement technologies, which we are proposing to allow in the rule. We have heard strong interest from various stakeholders on employing new tools for methane identification and quantification, particularly for large emission sources (commonly known as "super-emitters"). Information provided in response to this proposal may be used to evaluate whether a change in BSER from

the proposed quarterly OGI monitoring to a monitoring program using alternative measurement technologies is appropriate. Separate from the role of these alternative measurement technologies in a regulatory monitoring program, we are also soliciting comment on ways to structure a pathway for communities to identify large emission events which owners or operators would then be required to investigate, and mechanisms for the collection and public dissemination of this information, for possible further development as part of a supplemental proposal.

This preamble includes comment solicitations/requests on several topics and issues. We have prepared a separate memorandum that presents these comment requests by section and topic as a guide to assist commenters in preparing comments. This memorandum can be obtained from the Docket for this action (see Docket ID No. EPA-HQ-OAR-2021-0317). The title of the memorandum is "Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review – Proposed Rule Summary of Comment Solicitations."

B. Summary of the Major Provisions of this Regulatory Action

This proposed rulemaking includes three distinct groups of actions under the CAA that are each severable from the other. First, pursuant to CAA 111(b)(1)(B), the EPA has reviewed, and is proposing revisions to, the standards of performance for the Crude Oil and Natural Gas source category published in 2016 and amended in 2020, codified at 40 CFR part 60, subpart OOOOa - *Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015* (2016 NSPS OOOOa). Specifically, the EPA is proposing to update, strengthen, and expand the current requirements under CAA section 111(b) for methane and VOC emissions from sources that

commenced construction, modification, or reconstruction after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. These proposed standards of performance will be in a new subpart, 40 CFR part 60, subpart OOOOb (NSPS OOOOb), and include standards for emission sources previously not regulated under the 2016 NSPS OOOOa.

Second, pursuant to CAA 111(d), the EPA is proposing the first nationwide EG for States to limit methane pollution from designated facilities in the Crude Oil and Natural Gas source category. The EG being proposed in this rulemaking will be in a new subpart, 40 CFR part 60, subpart OOOOc (EG OOOOc). The EG are designed to inform States in the development, submittal, and implementation of State plans that are required to establish standards of performance for GHGs from their designated facilities in the Crude Oil and Natural Gas source category.

Third, the EPA is taking several related actions stemming from the joint resolution of Congress, adopted on June 30, 2021 under the CRA, disapproving the EPA's final rule titled, "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review," 85 FR 57018 (Sept. 14, 2020) ("2020 Policy Rule"). As explained in Section X of this action (Summary of Proposed Action for NSPS OOOOa), the EPA is proposing amendments to the 2016 NSPS OOOOa to address (1) certain inconsistencies between the VOC and methane standards resulting from the disapproval of the 2020 Policy Rule, and (2) certain determinations made in the final rule titled "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Reconsideration," 85 FR 57398 (September 15, 2020) (2020 Technical Rule), specifically with respect to fugitive emissions monitoring at low production well sites and gathering and boosting stations. With respect to the latter, as described

below, the EPA is proposing to rescind provisions of the 2020 Technical Rule that were not supported by the record for that rule, or by our subsequent information and analysis. The regulatory text for these proposed amendments is included in the docket for this rulemaking at Docket ID EPA-HQ-OAR-2021-0317.

In addition, in the final rule for this action, the EPA will update the NSPS OOOO and NSPS OOOOa provisions in the Code of Federal Regulations (CFR) to reflect the Congressional Review Act (CRA) resolution's disapproval of the final 2020 Policy Rule, specifically, the reinstatement of the NSPS OOOO and NSPS OOOOa requirements that the 2020 Policy Rule repealed but that came back into effect immediately upon enactment of the CRA resolution. It should be noted that these requirements have come back into effect already even though the EPA has not yet updated the CFR text to reflect them.[6] These updates to the CFR text are also included in the docket for this rulemaking at Docket ID EPA-HQ-OAR-2021-0317 for public awareness, but the EPA is not soliciting comment on them as they merely reflect current law. Under 5 U.S.C. 553(b)(3)(B), notice and comment is not required "when the agency for good cause finds … that notice and public procedure thereon are … unnecessary…,"[7] and, as just noted, notice and comment is not necessary for these updates. The EPA is waiting to make these updates to the CFR text until the final rule simply because it would be more efficient and clearer to amend the CFR once at the end of this rulemaking process to account for all changes to the

[6] See Congressional Review Act Resolution to Disapprove EPA's 2020 Oil and Gas Policy Rule Questions and Answers (June 30, 2021) available at https://www.epa.gov/system/files/documents/2021-07/qa_cra_for_2020_oil_and_gas_policy_rule.6.30.2021.pdf.

[7] 5 U.S.C. 553(b)(3)(B) is applicable to rules promulgated under CAA section 111(b), under CAA section 307(d)(1) (flush language at end).

2012 NSPS OOOO and 2016 NSPS OOOOa at the same time.

As CAA section 111(a)(1) requires, the standards of performance being proposed in this action reflect "the degree of emission limitation achievable through the application of the best system of emission reduction [BSER] which (taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirement) the Administrator determines has been adequately demonstrated." This action further proposes EG for designated facilities, under which States must submit plans which establish standards of performance that reflect the degree of emission limitation achievable through application of the BSER, as identified in the final EG. In this proposed rulemaking, we evaluated potential control measures available for the affected facilities, the emission reductions achievable through these measures, and employed multiple approaches to evaluate the reasonableness of control costs associated with the options under consideration. For example, in evaluating controls for reducing VOC and methane emissions from new sources, we considered a control measure's cost-effectiveness under both a "single pollutant cost-effectiveness" approach and a "multipollutant cost-effectiveness" approach, to appropriately consider that the systems of emission reduction considered in this rule typically achieve reductions in multiple pollutants at once and secure a multiplicity of climate and public health benefits. For a detailed discussion of the EPA's consideration of this and other BSER statutory elements, please see sections IV and IX of this preamble.

TABLE 1: APPLICABILITY DATES FOR PROPOSED SUBPARTS ADDRESSED IN THIS PROPOSED ACTION

Subpart	Source Type	Applicable Dates
40 CFR part 60, subpart OOOO	New, modified, or reconstructed sources	After August 23, 2011 and on or before September 18, 2015

40 CFR part 60, subpart OOOOa	New, modified, or reconstructed sources	After September 18, 2015 and on or before [**INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER**]
40 CFR part 60, subpart OOOOb	New, modified, or reconstructed sources	After [**INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER**]
40 CFR part 60, subpart OOOOc	Existing sources	On or before [**INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER**]

1. Proposed Standards for New, Modified and Reconstructed Sources after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]** (Proposed NSPS OOOOb)

As described in sections XI and XII of this preamble, under the authority of CAA section 111(b)(1)(B) the EPA has reviewed the VOC, GHG (in the form of limitations on methane), and SO_2 standards in the 2016 NSPS OOOOa (as amended in 2020 by the Technical Rule). Based on its review, the EPA is proposing revisions to the standards for certain emissions sources to reflect the updated BSER for those affected sources. Where our analyses show that the BSER for an affected source remains the same, the EPA is proposing to retain the current standard for that affected source. In addition, the EPA is proposing methane and VOC standards for several new sources that are currently unregulated. The proposed NSPS described above would apply to new, modified, and reconstructed emission sources across the Crude Oil and Natural Gas source category, including the production, processing, transmission, and storage segments, for which construction, reconstruction, or modification commenced after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, which is the date of publication of the proposed revisions to the NSPS. In particular, this action proposes to retain the 2016 NSPS

OOOOa SO_2 performance standard for sweetening units and the 2016 OOOOa VOC and methane performance standards for well completions and centrifugal compressors; proposes revisions to strengthen the 2016 NSPS OOOOa VOC and methane standards addressing fugitive emissions from well sites and compressor stations, storage vessels, pneumatic controllers, reciprocating compressors, pneumatic pumps, and equipment leaks at natural gas processing plants; and proposes new VOC and methane standards for well liquids unloading operations and intermittent vent pneumatic controllers, and oil wells with associated gas previously not regulated in the 2016 NSPS OOOOa. A summary of the proposed BSER determination and proposed NSPS for new, modified, and reconstructed sources (NSPS OOOOb) is presented in Table 2. See sections XI and XII of this preamble for a complete discussion of BSER determination and proposed NSPS requirements.

This proposal also solicits certain information relevant to the potential identification of additional emissions sources as affected facilities. Specifically, the EPA is evaluating the potential for establishing standards for abandoned and unplugged wells, blowdown emissions associated with pipeline pig launchers and receivers, and tank truck loading operations. While the EPA has assessed these sources based on currently available information, we have determined that we need additional information to evaluate BSER and to propose NSPS for these emissions sources. A full discussion of the solicitation for comment regarding these additional emission sources is found in section XIII of the preamble.

2. Proposed EG for Sources Constructed Prior to **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]** (Proposed EG OOOOc)

As described in sections XI and XII of this preamble, under the authority of CAA section

111(d), the EPA is proposing the first nationwide EG for GHG (in the form of methane limitations) for the Crude Oil and Natural Gas source category, including the production, processing, transmission, and storage segments (EG OOOOc). When the EPA establishes NSPS for a source category, the EPA is required to issue EG to reduce emissions of certain pollutants from existing sources in that same source category. In such circumstances, under CAA section 111(d), the EPA must issue regulations to establish procedures under which States submit plans to establish, implement, and enforce standards of performance for existing sources for certain air pollutants to which a Federal NSPS would apply if such existing source were a new source. Thus, the issuance of CAA section 111(d) final EG does not impose binding requirements directly on sources but instead provides requirements for states in developing their plans. Although State plans bear the obligation to establish standards of performance, under CAA sections 111(a)(1) and 111(d), those standards of performance must reflect the degree of emission limitation achievable through the application of the BSER as determined by the Administrator. As provided in section 111(d), a State may choose to take into account remaining useful life and other factors in applying a standard of performance to a particular source, consistent with the CAA, the EPA's implementing regulations, and the final EG.

In this action, the EPA is proposing BSER determinations and the degree of limitation achievable through application of the BSER for certain existing equipment, processes, and activities across the Crude Oil and Natural Gas source category. Section XIV of this preamble discusses the components of EG, including the steps, requirements, and considerations associated with the development, submittal, and implementation of State, Tribal, and Federal plans, as appropriate. For the EG, the EPA is proposing to translate the degree of emission limitation

achievable through application of the BSER (*i.e.,* level of stringency) into presumptive standards that States may use in the development of State plans for specific designated facilities. By doing this, the EPA has formatted the proposed EG such that if a State chooses to adopt these presumptive standards, once finalized, as the standards of performance in a State plan, the EPA could approve such a plan as meeting the requirements of CAA section 111(d) and the finalized EG, if the plan meets all other applicable requirements. In this way, the presumptive standards included in the EG serve a function similar to that of a model rule,[8] because they are intended to assist States in developing their plan submissions by providing States with a starting point for standards that are based on general industry parameters and assumptions. The EPA believes that providing these presumptive standards will create a streamlined approach for States in developing plans and the EPA in evaluating State plans. However, the EPA's action on each State plan submission is carried out via rulemaking, which includes public notice and comment. Inclusion of presumptive standards in the EG does not seek to pre-determine the outcomes of any future rulemaking.

Designated facilities located in Indian country would not be encompassed within a State's CAA section 111(d) plan. Instead, an eligible Tribe that has one or more designated facilities located in its area of Indian country would have the opportunity, but not the obligation, to seek authority and submit a plan that establishes standards of performance for those facilities on its Tribal lands. If a Tribe does not submit a plan, or if the EPA does not approve a Tribe's plan,

[8] The presumptive standards are not the same as a Federal plan under CAA section 111(d)(2). The EPA has an obligation to promulgate a Federal plan if a state fails to submit a satisfactory plan. In such circumstances, the final EG and presumptive standards would serve as a guide to the development of a Federal plan. See section XIV.F. for information on Federal plans.

then the EPA has the authority to establish a Federal plan for that Tribe. A summary of the proposed EG for existing sources (EG OOOOc) for the oil and natural gas sector is presented in Table 3. See sections XI and XII of this preamble for a complete discussion of the proposed EG requirements.

As discussed above for the proposed NSPS OOOOb, the EPA is considering including additional sources as affected facilities in a potential future supplemental rulemaking proposal[9] under CAA section 111(b). The EPA is also considering including these additional sources as designated facilities under the EG in OOOOc in a potential future supplemental rulemaking proposal under CAA section 111(d). As with the proposed NSPS OOOOb, the EPA is evaluating the potential for establishing EG applicable to abandoned and unplugged wells, blowdown emissions associated with pipeline pig launchers and receivers, and tank truck loading operations (assuming the EPA establishes NSPS for these emissions points). As described in section XIII of this preamble, the EPA is soliciting information to assist in this effort.

3. Proposed Amendments to 2016 NSPS OOOOa, and CRA-Related CFR Updates

The EPA is also proposing certain modifications to the 2016 NSPS OOOOa to address certain amendments to the VOC standards for sources in the production and processing segments finalized in the 2020 Technical Rule. Because the methane standards for the production and processing segments and all standards for the transmission and storage segment were removed from the 2016 NSPS OOOOa via the 2020 Policy Rule prior to the finalization of the 2020 Technical Rule, the latter amendments apply only to the 2016 NSPS OOOOa VOC standards for the production and processing segments. In this proposed rulemaking, the EPA also is proposing

[9] A supplemental proposal would include an updated RIA.

to apply some of the 2020 Technical Rule amendments to the methane standards for all industry segments and to VOC standards for the transmission and storage segment in the 2016 NSPS OOOOa. These amendments are associated with the requirements for well completions, pneumatic pumps, closed vent systems, fugitive emissions, alternative means of emission limitation (AMELs), onshore natural gas processing plants, as well as other technical clarifications and corrections. The EPA also is proposing to repeal the amendments in the 2020 Technical Rule that (1) exempted low production well sites from monitoring fugitive emissions and (2) changed monitoring of VOC emissions at gathering and boosting compressor stations from quarterly to semiannual, which currently apply only to VOC standards (not methane standards) from the production and processing segments. A summary of the proposed amendments to the 2016 OOOOa NSPS is presented in section X of this preamble.

Lastly, in the final rule for this action, the EPA will update the NSPS OOOO and OOOOa provisions in the CFR to reflect the CRA resolution's disapproval of the final 2020 Policy Rule, specifically, the reinstatement of the OOOO and OOOOa requirements that the 2020 Policy Rule repealed but that came back into effect immediately upon enactment of the CRA resolution. The EPA is waiting to make the updates to the CFR text until the final rule simply because it would be more efficient and clearer to amend the CFR once at the end of this rulemaking process to account for all changes to the 2012 NSPS OOOO and 2016 NSPS OOOOa at the same time. In accordance with 5 U.S.C. 553(b)(3)(B), the EPA is not soliciting comment on these updates.

TABLE 2: SUMMARY OF PROPOSED BSER AND PROPOSED STANDARDS OF PERFORMANCE FOR GHGS AND VOC (NSPS OOOOb)

Affected Source	Proposed BSER	Proposed Standards of Performance for GHGs and VOCs

Fugitive Emissions: Well Sites with Baseline Emissions >0 to <3 tpy[1] Methane.	Demonstrate actual site emissions are reflected in calculation.	Perform survey to verify that actual site emissions are reflected in calculation.
Fugitive Emissions: Well Sites ≥3 tpy Methane.	Monitoring and repair based on quarterly monitoring using OGI.	Quarterly OGI monitoring following Appendix K. (Optional quarterly EPA Method 21 monitoring with 500 ppm defined as a leak). First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.
(Co-proposal) Fugitive Emissions: Well Sites with Baseline Emissions ≥3 to <8 tpy Methane.	Monitoring and repair based on semiannual monitoring using OGI.	Semiannual OGI monitoring following Appendix K. (Optional semiannual EPA Method 21 monitoring with 500 ppm defined as a leak). First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.
(Co-proposal) Fugitive Emissions: Well Sites with Baseline Emissions ≥8 tpy Methane.	Monitoring and repair based on quarterly monitoring using OGI[2].	Quarterly OGI monitoring following Appendix K. (Optional quarterly EPA Method 21 monitoring with 500 ppm[3] defined as a leak). First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.
Fugitive Emissions: Compressor Stations.	Monitoring and repair based on quarterly monitoring using OGI.	Quarterly OGI monitoring following Appendix K. (Optional quarterly EPA Method 21 monitoring with 500 ppm defined as a leak). First attempt at repair within 30 days of finding fugitive emissions.

		Final repair within 30 days of first attempt.
Fugitive Emissions: Well Sites and Compressor Stations on Alaska North Slope.	Monitoring and repair based on annual monitoring using OGI.	Annual OGI monitoring following Appendix K. (Optional annual EPA Method 21 monitoring with 500 ppm defined as a leak). First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.
Fugitive Emissions: Well Sites and Compressor Stations.	(Optional) Screening, monitoring, and repair based on bimonthly screening using an advanced measurement technology and annual monitoring using OGI.	(Optional) Alternative bimonthly screening with advanced measurement technology with annual OGI monitoring following Appendix K.
Storage Vessels: A Single Storage Vessel or Tank Battery with PTE[4] of 6 tpy or More of VOC.	Capture and route to a control device.	95 percent reduction of VOC and methane.
Pneumatic Controllers: Natural Gas Driven that Vent to the Atmosphere.	Use of zero-emissions controllers.	VOC and methane emission rate of zero.
Pneumatic Controllers: Alaska (at sites where onsite power is not available - continuous bleed natural gas driven).	Installation of low-bleed pneumatic controllers.	Natural gas bleed rate no greater than 6 scfh[5].
Pneumatic Controllers: Alaska (at sites where onsite power is not available - intermittent	Monitor and repair through fugitive emissions program.	OGI monitoring and repair of emissions from controller malfunctions.

natural gas driven).		
Well Liquids Unloading.	Perform liquids unloading with zero methane or VOC emissions. If this is not feasible for safety or technical reasons, employ best management practices to minimize venting.	Each affected well that unloads liquids employ techniques or technology(ies) that eliminate or minimize venting of emissions during liquids unloading events to the maximum extent. **Co Proposal Options:** *Option One*- Affected facility would be defined as every well that undergoes liquids unloading. -If the method is one that does not result in any venting to the atmosphere, maintain records specifying the technology or technique and record instances where an unloading event results in emissions. -For unloading technologies or techniques that result in venting to the atmosphere, implement BMPs[6] to ensure that venting is minimized. -Maintain BMPs as records, and record instances when they were not followed. *Option Two* - Affected facility would be defined as every well that undergoes liquids unloading using a method that is not designed to eliminate venting. -Wells that utilize non-venting methods would not be affected facilities that are subject to the NSPS OOOOb. Therefore, they would not have requirements other than to maintain records to document that they used non-venting liquids unloading methods.

		-The requirements for wells that use methods that vent would be the same as described above under Option 1.
Wet Seal Centrifugal Compressors (except for those located at single well sites).	Capture and route emissions from the wet seal fluid degassing system to a control device or to a process.	Reduce emissions by 95 percent.
Reciprocating Compressors (except for those located at single well sites).	Replace the reciprocating compressor rod packing based on annual monitoring (when measured leak rate exceeds 2 scfm[7]) or route emissions to a process.	Replace the reciprocating compressor rod packing when measured leak rate exceeds 2 scfm based on the results of annual monitoring or collect and route emissions from the rod packing to a process through a closed vent system under negative pressure.
Pneumatic Pumps: Natural Gas Processing Plants.	A natural gas emission rate of zero.	A natural gas emission rate of zero from diaphragm and piston pneumatic pumps.
Pneumatic Pumps: Production Segment.	Route diaphragm and piston pneumatic pumps to an existing control device or process.	95 percent control of diaphragm and piston pneumatic pumps if there is an existing control or process on site. 95 percent control not required if (1) routed to an existing control that achieves less than 95 percent or (2) it is technically infeasible to route to the existing control device or process.
Pneumatic Pumps: Transmission and Storage Segment.	Route diaphragm pneumatic pumps to an existing control device or process.	95 percent control of diaphragm pneumatic pumps if there is an existing control or process on site. 95 percent control not required if (1) routed to an existing control that achieves less than 95 percent or (2) it is technically infeasible to route to the existing control device or process.
Well Completions: Subcategory 1	Combination of REC[8] and the use of a completion combustion device.	Applies to each well completion operation with hydraulic fracturing.

(non-wildcat and non-delineation wells).		REC in combination with a completion combustion device; venting in lieu of combustion where combustion would present safety hazards. Initial flowback stage: Route to a storage vessel or completion vessel (frac tank, lined pit, or other vessel) and separator. Separation flowback stage: Route all salable gas from the separator to a flow line or collection system, re-inject the gas into the well or another well, use the gas as an onsite fuel source or use for another useful purpose that a purchased fuel or raw material would serve. If technically infeasible to route recovered gas as specified above, recovered gas must be combusted. All liquids must be routed to a storage vessel or well completion vessel, collection system, or be re-injected into the well or another well. The operator is required to have (and use) a separator onsite during the entire flowback period.
Well Completions: Subcategory 2 (exploratory and delineation wells and low-pressure wells).	Use of a completion combustion device.	Applies to each well completion operation with hydraulic fracturing. The operator is not required to have a separator onsite. Either: (1) Route all flowback to a completion combustion device with a continuous pilot flame; or (2) Route all flowback into one or more well completion vessels and commence operation of a separator

		unless it is technically infeasible for a separator to function. Any gas present in the flowback before the separator can function is not subject to control under this section. Capture and direct recovered gas to a completion combustion device with a continuous pilot flame. For both options (1) and (2), combustion is not required in conditions that may result in a fire hazard or explosion, or where high heat emissions from a completion combustion device may negatively impact tundra, permafrost, or waterways.
Equipment Leaks at Natural Gas Processing Plants.	LDAR[9] with bimonthly OGI.	LDAR with OGI following procedures in Appendix K.
Oil Wells with Associated Gas.	Route associated gas to a sales line. If access to a sales line is not available, the gas can be used as an onsite fuel source, used for another useful purpose that a purchased fuel or raw material would serve, or routed to a flare or other control device that achieves at least 95 percent reduction in methane and VOC emissions.	Route associated gas to a sales line. If access to a sales line is not available, the gas can be used as an onsite fuel source, used for another useful purpose that a purchased fuel or raw material would serve, or routed to a flare or other control device that achieves at least 95 percent reduction in methane and VOC emissions.
Sweetening Units.	Achieve SO_2 emission reduction efficiency.	Achieve required minimum SO_2 emission reduction efficiency.

[1] tpy (tons per year)
[2] OGI (optical gas imaging)
[3] ppm (parts per million)
[4] PTE (potential to emit)
[5] scfh (standard cubic feet per hour)
[6] BMP (best management practices)
[7] scfm (standard cubic feet per minute)
[8] REC (reduced emissions completion)
[9] LDAR (leak detection and repair)

TABLE 3: SUMMARY OF PROPOSED BSER AND PROPOSED PRESUMPTIVE STANDARDS FOR GHGS FROM DESIGNATED FACILITIES (EG OOOOc)

Designated Facility	Proposed BSER	Proposed Presumptive Standards for GHGs
Fugitive Emissions: Well Sites >0 to <3 tpy Methane.	Demonstrate actual site emissions are reflected in calculation.	Perform survey to verify that actual site emissions are reflected in calculation.
Fugitive Emissions: Well Sites ≥3 tpy Methane.	Monitoring and repair based on quarterly monitoring using OGI.	Quarterly OGI monitoring following Appendix K. (Optional quarterly EPA Method 21 monitoring with 500 ppm defined as a leak). First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.
(Co-proposal) Fugitive Emissions: Well Sites ≥3 to <8 tpy Methane.	Monitoring and repair based on semiannual monitoring using OGI.	Semiannual OGI monitoring following Appendix K. (Optional semiannual EPA Method 21 monitoring with 500 ppm defined as a leak). First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.
(Co-proposal) Fugitive Emissions: Well Sites ≥8 tpy Methane.	Monitoring and repair based on quarterly monitoring using OGI.	Quarterly OGI monitoring following Appendix K. (Optional quarterly EPA Method 21 monitoring with 500 ppm defined as a leak). First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.
Fugitive Emissions: Compressor Stations.	Monitoring and repair based on quarterly monitoring using OGI.	Quarterly OGI monitoring following Appendix K. (Optional quarterly EPA Method 21 monitoring with 500 ppm defined as a leak). First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.
Fugitive Emissions: Well Sites and Compressor Stations on Alaska North Slope.	Monitoring and repair based on annual monitoring using OGI.	Annual OGI monitoring following Appendix K. (Optional annual EPA Method 21 monitoring with 500 ppm defined as a leak).

		First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.
Fugitive Emissions: Well Sites and Compressor Stations.	(Optional) Screening, monitoring, and repair based on bimonthly screening using an advanced measurement technology and annual monitoring using OGI.	(Optional) Alternative bimonthly screening with advanced measurement technology with annual OGI monitoring following Appendix K.
Storage Vessels: Tank Battery with PTE of 20 tpy or More of Methane.	Capture and route to a control device.	95 percent reduction of methane.
Pneumatic Controllers: Natural Gas Driven that Vent to the Atmosphere.	Use of zero-emissions controllers.	VOC and methane emission rate of zero.
Pneumatic Controllers: Alaska (at sites where onsite power is not available -continuous bleed natural gas driven).	Installation of low-bleed pneumatic controllers.	Natural gas bleed rate no greater than 6 scfh.
Pneumatic Controllers: Alaska (at sites where onsite power is not available -intermittent natural gas driven).	Monitor and repair through fugitive emissions program.	OGI monitoring and repair of emissions from controller malfunctions.
Wet Seal Centrifugal Compressors (except for those located at single well sites).	Capture and route emissions from the wet seal fluid degassing system to a control device or to a process.	Reduce emissions by 95 percent.
Reciprocating Compressors (except for those located at single well sites).	Replace the reciprocating compressor rod packing based on annual monitoring (when measured leak rate exceeds 2 scfm) or route emissions to a	Replace the reciprocating compressor rod packing when measured leak rate exceeds 2 scfm based on the results of annual monitoring, or collect and route emissions from the rod packing to a process through a closed vent system under negative pressure.

	process.	
Pneumatic Pumps: Natural Gas Processing Plants.	A natural gas emission rate of zero.	Zero natural gas emissions from diaphragm and piston pneumatic pumps.
Pneumatic Pumps: Locations Other Than Natural Gas Processing Plants.	Route diaphragm pumps to an existing control device or process.	95 percent control of diaphragm pneumatic pumps if there is an existing control or process on site. 95 percent control not required if (1) routed to an existing control that achieves less than 95 percent or (2) it is technically infeasible to route to the existing control device or process.
Equipment Leaks at Natural Gas Processing Plants.	LDAR with bimonthly OGI.	LDAR with OGI following procedures in Appendix K.
Oil Wells with Associated Gas.	Route associated gas to a sales line. If access to a sales line is not available, the gas can be used as an onsite fuel source, used for another useful purpose that a purchased fuel or raw material would serve, or routed to a flare or other control device that achieves at least 95 percent reduction in methane and VOC emissions.	Route associated gas to a sales line. If access to a sales line is not available, the gas can be used as an onsite fuel source, used for another useful purpose that a purchased fuel or raw material would serve, or routed to a flare or other control device that achieves at least 95 percent reduction in methane and VOC emissions.

C. Costs and Benefits

To satisfy requirements of EO 12866, the EPA projected the emissions reductions, costs, and benefits that may result from this proposed action. These results are presented in detail in the regulatory impact analysis (RIA) accompanying this proposal developed in response to EO 12866. The RIA focuses on the elements of the proposed rule that are likely to result in quantifiable cost or emissions changes compared to a baseline without the proposal that

incorporates changes to regulatory requirements induced by the CRA resolution. We estimated the cost, emissions, and benefit impacts for the 2023 to 2035 period. We present the present value (PV) and equivalent annual value (EAV) of costs, benefits, and net benefits of this action in 2019 dollars.

The initial analysis year in the RIA is 2023 as we assume the proposed rule will be finalized towards the end of 2022. The NSPS will take effect immediately and impact sources constructed after publication of the proposed rule. The EG will take longer to go into effect as States will need to develop implementation plans in response to the rule and have them approved by the EPA. We assume in the RIA that this process will take three years, and so EG impacts will begin in 2026. The final analysis year is 2035, which allows us to provide ten years of projected impacts after the EG is assumed to take effect.

The cost analysis presented in the RIA reflects a nationwide engineering analysis of compliance cost and emissions reductions, of which there are two main components. The first component is a set of representative or model plants for each regulated facility, segment, and control option. The characteristics of the model plant include typical equipment, operating characteristics, and representative factors including baseline emissions and the costs, emissions reductions, and product recovery resulting from each control option. The second component is a set of projections of activity data for affected facilities, distinguished by vintage, year, and other necessary attributes (*e.g.*, oil versus natural gas wells). Impacts are calculated by setting parameters on how and when affected facilities are assumed to respond to a particular regulatory regime, multiplying activity data by model plant cost and emissions estimates, differencing from the baseline scenario, and then summing to the desired level of aggregation. In addition to

emissions reductions, some control options result in natural gas recovery, which can then be combusted in production or sold. Where applicable, we present projected compliance costs with and without the projected revenues from product recovery.

The EPA expects climate and health benefits due to the emissions reductions projected under this proposed rule. The EPA estimated the global social benefits of CH_4 emission reductions expected from this proposed rule using the SC-CH_4 estimates presented in the "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under EO 13990 (IWG 2021)". These SC-CH_4 estimates are interim values developed under EO 13990 for use in benefit-cost analyses until updated estimates of the impacts of climate change can be developed based on the best available science and economics.

Under the proposed rule, the EPA expects that VOC emission reductions will improve air quality and are likely to improve health and welfare associated with exposure to ozone, $PM_{2.5}$, and HAP. Calculating ozone impacts from VOC emissions changes requires information about the spatial patterns in those emissions changes. In addition, the ozone health effects from the proposed rule will depend on the relative proximity of expected VOC and ozone changes to population. In this analysis, we have not characterized VOC emissions changes at a finer spatial resolution than the national total. In light of these uncertainties, we present an illustrative screening analysis in Appendix B of the RIA based on modeled oil and natural gas VOC contributions to ozone concentrations as they occurred in 2017 and do not include the results of this analysis in the estimate of benefits and net benefits projected from this proposal.

The projected national-level emissions reductions over the 2023 to 2035 period anticipated under the proposed requirements are presented in Table 4. Table 5 presents the PV

and EAV of the projected benefits, costs, and net benefits over the 2023 to 2035 period under the proposed requirements using discount rates of 3 and 7 percent.

TABLE 4. PROJECTED EMISSIONS REDUCTIONS UNDER THE PROPOSED RULE, 2023-2035 TOTAL

Pollutant	Emissions Reductions (2023-2035 Total)
Methane (million short tons)[a]	41
VOC (million short tons)	12
Hazardous Air Pollutant (million short tons)	0.48
Methane (million metric tons CO_2 Eq.)[b]	920

[a] To convert from short tons to metric tons, multiply the short tons by 0.907. Alternatively, to convert metric tons to short tons, multiply metric tons by 1.102.
[b] CO_2 Eq. calculated using a global warming potential of 25.

TABLE 5. BENEFITS, COSTS, NET BENEFITS, AND EMISSIONS REDUCTIONS OF THE PROPOSED RULE, 2023 THROUGH 2035 (DOLLAR ESTIMATES IN MILLIONS OF 2019 DOLLARS)

	3 Percent Discount Rate			
	Present Value	Equivalent Annual Value	Present Value	Equivalent Annual Value
Climate Benefits[b]	$55,000	$5,200	$55,000	$5,200
	3 Percent Discount Rate		7 Percent Discount Rate	
	Present Value	Equivalent Annual Value	Present Value	Equivalent Annual Value
Net Compliance Costs	$7,200	$680	$6,300	$760
Compliance Costs	$13,000	$1,200	$10,000	$1,200
Product Recovery	$5,500	$520	$3,900	$470
Net Benefits	$48,000	$4,500	$49,000	$4,500
Non-Monetized Benefits	Climate and ozone health benefits from reducing 41 million short tons of methane from 2023 to 2035			
	$PM_{2.5}$ and ozone health benefits from reducing 12 million short tons of VOC from 2023 to 2035[c]			
	HAP benefits from reducing 480 thousand short tons of HAP from 2023 to 2035			
	Visibility benefits			

	Reduced vegetation effects

[a] Values rounded to two significant figures. Totals may not appear to add correctly due to rounding.
[b] Climate benefits are based on reductions in methane emissions and are calculated using four different estimates of the social cost of methane (SC-CH_4) (model average at 2.5 percent, 3 percent, and 5 percent discount rates; 95th percentile at 3 percent discount rate). For the presentational purposes of this table, we show the benefits associated with the average SC-CH_4 at a 3 percent discount rate, but the Agency does not have a single central SC-CH_4 point estimate. We emphasize the importance and value of considering the benefits calculated using all four SC-CH_4 estimates; the present value (and equivalent annual value) of the additional benefit estimates ranges from $22 billion to $150 billion ($2.4 billion to $14 billion) over 2023 to 2035 for the proposed option. Please see Table 3-5 and Table 3-7 of the RIA for the full range of SC-CH_4 estimates. As discussed in Section 3 of the RIA, a consideration of climate benefits calculated using discount rates below 3 percent, including 2 percent and lower, are also warranted when discounting intergenerational impacts. All net benefits are calculated using climate benefits discounted at 3 percent.
[c] A screening-level analysis of ozone benefits from VOC reductions can be found in Appendix B of the RIA, which is included in the docket.

II. General Information

A. Does this action apply to me?

Categories and entities potentially affected by this action include:

TABLE 6. INDUSTRIAL SOURCE CATEGORIES AFFECTED BY THIS ACTION

Category	NAICS Code[1]	Examples of Regulated Entities
Industry	211120	Crude Petroleum Extraction.
	211130	Natural Gas Extraction.
	221210	Natural Gas Distribution.
	486110	Pipeline Distribution of Crude Oil.
	486210	Pipeline Transportation of Natural Gas.
Federal Government	. . . .	Not affected.
State/local/Tribal government	. . . .	Not affected.

[1] North American Industry Classification System (NAICS).

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this action. Other types of entities not listed in the table

could also be affected by this action. To determine whether your entity is affected by this action, you should carefully examine the applicability criteria found in the final rule. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the **FOR FURTHER INFORMATION CONTACT** section, your air permitting authority, or your EPA Regional representative listed in 40 CFR 60.4 (General Provisions).

B. How do I obtain a copy of this document, background information, and other related information?

In addition to being available in the docket, an electronic copy of the proposed action is available on the Internet. Following signature by the Administrator, the EPA will post a copy of this proposed action at *https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry*. Following publication in the *Federal Register*, the EPA will post the *Federal Register* version of the final rule and key technical documents at this same website. A redline version of the regulatory language that incorporates the proposed changes described in section X for NSPS OOOO and NSPS OOOOa is available in the docket for this action (Docket ID No. EPA-HQ-OAR-2021-0317). The EPA plans to propose the regulatory language for NSPS OOOOb and EG OOOOc through a supplemental action.

III. Air Emissions from the Crude Oil and Natural Gas Sector and Public Health and Welfare

A. Impacts of GHGs, VOCs and SO_2 Emissions on Public Health and Welfare

As noted previously, the Oil and Natural Gas Industry emits a wide range of pollutants, including GHGs (such as methane and CO_2), VOCs, SO_2, NO_X, H_2S, CS_2, and COS. See 49 FR 2636, 2637 (January 20, 1984). As noted below, to this point, the EPA has focused its regulatory

efforts on GHGs, VOC, and SO_2.[10]

1. Climate Change Impacts from GHGs Emissions

Elevated concentrations of GHGs are and have been warming the planet, leading to changes in the Earth's climate including changes in the frequency and intensity of heat waves, precipitation, and extreme weather events; rising seas; and retreating snow and ice. The changes taking place in the atmosphere as a result of the well-documented buildup of GHGs due to human activities are changing the climate at a pace and in a way that threatens human health, society, and the natural environment. Human induced GHGs, largely derived from our reliance on fossil fuels, are causing serious and life-threatening environmental and health impacts.

Extensive additional information on climate change is available in the scientific assessments and the EPA documents that are briefly described in this section, as well as in the technical and scientific information supporting them. One of those documents is the EPA's 2009 *Endangerment and Cause or Contribute Findings for GHGs Under Section 202(a)* of the CAA (74 FR 66496, December 15, 2009).[11] In the 2009 Endangerment Findings, the Administrator found under section 202(a) of the CAA that elevated atmospheric concentrations of six key well-mixed GHGs – CO_2, CH_4, N_2O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) – "may reasonably be anticipated to endanger the public health and welfare of current and future generations." (74 FR 66523, December 15, 2009), and the science

[10] We note that the EPA's focus on GHGs (in particular methane), VOC, and SO_2 in these analyses, does not in any way limit the EPA's authority to promulgate standards that would apply to other pollutants emitted from the Crude Oil and Natural Gas source category, if the EPA determines in the future that such action is appropriate.

[11] In describing these 2009 Findings in this proposal, the EPA is neither reopening nor revisiting them.

and observed changes have confirmed and strengthened the understanding and concerns regarding the climate risks considered in the Finding. The 2009 Endangerment Findings, together with the extensive scientific and technical evidence in the supporting record, documented that climate change caused by human emissions of GHGs threatens the public health of the U.S. population. It explained that by raising average temperatures, climate change increases the likelihood of heat waves, which are associated with increased deaths and illnesses (74 FR 66497, December 15, 2009). While climate change also increases the likelihood of reductions in cold-related mortality, evidence indicates that the increases in heat mortality will be larger than the decreases in cold mortality in the U.S. (74 FR 66525, December 15, 2009). The 2009 Endangerment Findings further explained that compared to a future without climate change, climate change is expected to increase tropospheric ozone pollution over broad areas of the U.S., including in the largest metropolitan areas with the worst tropospheric ozone problems, and thereby increase the risk of adverse effects on public health (74 FR 66525, December 15, 2009). Climate change is also expected to cause more intense hurricanes and more frequent and intense storms of other types and heavy precipitation, with impacts on other areas of public health, such as the potential for increased deaths, injuries, infectious and waterborne diseases, and stress-related disorders (74 FR 66525, December 15, 2009). Children, the elderly, and the poor are among the most vulnerable to these climate-related health effects (74 FR 66498, December 15, 2009).

The 2009 Endangerment Findings also documented, together with the extensive scientific and technical evidence in the supporting record, that climate change touches nearly every aspect

of public welfare[12] in the U.S. with resulting economic costs, including: changes in water supply and quality due to increased frequency of drought and extreme rainfall events; increased risk of storm surge and flooding in coastal areas and land loss due to inundation; increases in peak electricity demand and risks to electricity infrastructure; and the potential for significant agricultural disruptions and crop failures (though offset to some extent by carbon fertilization). These impacts are also global and may exacerbate problems outside the U.S. that raise humanitarian, trade, and national security issues for the U.S. (74 FR 66530, December 15, 2009).

In 2016, the Administrator similarly issued Endangerment and Cause or Contribute Findings for GHG emissions from aircraft under section 231(a)(2)(A) of the CAA (81 FR 54422, August 15, 2016).[13] In the 2016 Endangerment Findings, the Administrator found that the body of scientific evidence amassed in the record for the 2009 Endangerment Findings compellingly supported a similar endangerment finding under CAA section 231(a)(2)(A), and also found that the science assessments released between the 2009 and the 2016 Findings, "strengthen and further support the judgment that GHGs in the atmosphere may reasonably be anticipated to endanger the public health and welfare of current and future generations." (81 FR 54424, August 15, 2016).

Since the 2016 Endangerment Findings, the climate has continued to change, with new

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[12] The CAA states in section 302(h) that "[a]ll language referring to effects on welfare includes, but is not limited to, effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being, whether caused by transformation, conversion, or combination with other air pollutants." 42 U.S.C. 7602(h).

[13] In describing these 2016 Findings in this proposal, the EPA is neither reopening nor revisiting them.

records being set for several climate indicators such as global average surface temperatures, GHG concentrations, and sea level rise. Moreover, heavy precipitation events have increased in the eastern U.S. while agricultural and ecological drought has increased in the western U.S. along with more intense and larger wildfires.[14] These and other trends are examples of the risks discussed the 2009 and 2016 Endangerment Findings that have already been experienced. Additionally, major scientific assessments continue to demonstrate advances in our understanding of the climate system and the impacts that GHGs have on public health and welfare both for current and future generations. These updated observations and projections document the rapid rate of current and future climate change both globally and in the U.S. These assessments include:

- U.S. Global Change Research Program's (USGCRP) 2016 Climate and Health Assessment[15] and 2017-2018 Fourth National Climate Assessment (NCA4)[16,17]

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[14] See later in this section for specific examples. An additional resource for indicators can be found at *https://www.epa.gov/climate-indicators*.

[15] USGCRP, 2016: *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment.* Crimmins, A., J. Balbus, J.L. Gamble, C.B. Beard, J.E. Bell, D. Dodgen, R.J. Eisen, N. Fann, M.D. Hawkins, S.C. Herring, L. Jantarasami, D.M. Mills, S. Saha, M.C. Sarofim, J. Trtanj, and L. Ziska, Eds. U.S. Global Change Research Program, Washington, DC, 312 pp.

[16] USGCRP, 2017: *Climate Science Special Report: Fourth National Climate Assessment*, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 470 pp, doi: 10.7930/J0J964J6.

[17] USGCRP, 2018: *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018.

- IPCC's 2018 Global Warming of 1.5°C[18], 2019 Climate Change and Land[19], and the 2019 Ocean and Cryosphere in a Changing Climate[20] assessments, as well as the 2021 IPCC Sixth Assessment Report (AR6).[21]
- The NAS 2016 Attribution of Extreme Weather Events in the Context of Climate Change[22], 2017 Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide[23], and 2019 Climate Change and Ecosystems[24] assessments
- National Oceanic and Atmospheric Administration's (NOAA) annual State of the Climate reports published by the Bulletin of the American Meteorological Society[25], most recently in August of 2020.
- EPA Climate Change and Social Vulnerability in the United States: A Focus on Six

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[18] IPCC, 2018: *Global Warming of 1.5°C*. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)].

[19] IPCC, 2019: *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems* [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)].

[20] IPCC, 2019: *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)].

[21] IPCC, 2021: *Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Cambridge University Press. In Press.

[22] National Academies of Sciences, Engineering, and Medicine. 2016. *Attribution of Extreme Weather Events in the Context of Climate Change*. Washington, DC: The National Academies Press. https://dio.org/10.17226/21852.

[23] National Academies of Sciences, Engineering, and Medicine. 2017. *Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide*. Washington, DC: The National Academies Press. https://doi.org/10.17226/24651.

[24] National Academies of Sciences, Engineering, and Medicine. 2019. *Climate Change and Ecosystems*. Washington, DC: The National Academies Press. https://doi.org/10.17226/25504.

[25] Blunden, J., and D.S. Arndt, Eds., 2020: State of the Climate in 2019. Bull. Amer. Meteor. Soc, S1-S429, *https://doi.org/10.1175/2020BAMSStateoftheClimate.1*.

Impacts (2021).[26]

The most recent information demonstrates that the climate is continuing to change in response to the human-induced buildup of GHGs in the atmosphere. These recent assessments show that atmospheric concentrations of GHGs have risen to a level that has no precedent in human history and that they continue to climb, primarily as a result of both historic and current anthropogenic emissions, and that these elevated concentrations endanger our health by affecting our food and water sources, the air we breathe, the weather we experience, and our interactions with the natural and built environments. For example, atmospheric concentrations of one of these GHGs, CO_2, measured at Mauna Loa in Hawaii and at other sites around the world reached 414 ppm in 2020 (nearly 50 percent higher than pre-industrial levels),[27] and has continued to rise at a rapid rate. Global average temperature has increased by about 1.1 degrees Celsius (°C) (2.0 degrees Fahrenheit (°F)) in the 2011-2020 decade relative to 1850-1900.[28] The years 2014 – 2020 were the warmest seven years in the 1880 – 2020 record, contributing to the warmest decade on record with a decadal temperature of 0.82°C (1.48°F) above the 20th century.[29,30] The IPCC determined (with medium confidence) that this past decade was warmer than any multi-

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[26] EPA. 2021. Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts. U.S. Environmental Protection Agency, EPA 430-R-21-003.
[27] *https://climate.nasa.gov/vital-signs/carbon-dioxide/*
[28] IPCC, 2021
[29] NOAA National Centers for Environmental Information, State of the Climate: Global Climate Report for Annual 2020, published online January 2021, retrieved on February 10, 2021 from *https://www.ncdc.noaa.gov/sotc/global/202013*.
[30] Blunden, J., and D.S. Arndt, Eds., 2020: State of the Climate in 2019. Bull. Amer. Meteor. Soc, S1-S429, *https://doi.org/10.1175/2020BAMSStateoftheClimate.1*.

century period in at least the past 100,000 years.[31] Global average sea level has risen by about 8 inches (about 21 centimeters (cm)) from 1901 to 2018, with the rate from 2006 to 2018 (0.15 inches/year or 3.7 millimeters (mm)/year) almost twice the rate over the 1971 to 2006 period, and three times the rate of the 1901 to 2018 period. [32] The rate of sea level rise over the 20th century was higher than in any other century in at least the last 2,800 years.[33] Higher CO_2 concentrations have led to acidification of the surface ocean in recent decades to an extent unusual in the past 2 million years, with negative impacts on marine organisms that use calcium carbonate to build shells or skeletons.[34] Arctic sea ice extent continues to decline in all months of the year; the most rapid reductions occur in September (very likely almost a 13 percent decrease per decade between 1979 and 2018) and are unprecedented in at least 1000 years.[35] Human-induced climate change has led to heatwaves and heavy precipitation becoming more frequent and more intense, along with increases in agricultural and ecological droughts[36] in many regions.[37]

The assessment literature demonstrates that modest additional amounts of warming may lead to a climate different from anything humans have ever experienced. The present-day CO_2

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[31] IPCC, 2021
[32] IPCC, 2021
[33] USGCRP, 2018: *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018.
[34] IPCC, 2021
[27] IPCC, 2021
[36] These are drought measures based on soil moisture.
[37] IPCC, 2021

concentration of 414 ppm is already higher than at any time in the last 2 million years.[38] If concentrations exceed 450 ppm, they would likely be higher than any time in the past 23 million years:[39] at the current rate of increase of more than 2 ppm a year, this would occur in about 15 years. While GHGs are not the only factor that controls climate, it is illustrative that 3 million years ago (the last time CO_2 concentrations were this high) Greenland was not yet completely covered by ice and still supported forests, while 23 million years ago (the last time concentrations were above 450 ppm) the West Antarctic ice sheet was not yet developed, indicating the possibility that high GHGs concentrations could lead to a world that looks very different from today and from the conditions in which human civilization has developed. If the Greenland and Antarctic ice sheets were to melt substantially, sea levels would rise dramatically - the IPCC estimated that over the next 2000 years, sea level will rise by 7 to 10 feet even if warming is limited to 1.5°C (2.7°F), from 7 to 20 feet if limited to 2°C (3.6°F), and by 60 to 70 feet if warming is allowed to reach 5°C (9°F) above preindustrial levels.[40] For context, almost all of the city of Miami is less than 25 feet above sea level, and the NCA4 stated that 13 million Americans would be at risk of migration due to 6 feet of sea level rise. Moreover, the CO_2 being absorbed by the ocean has resulted in changes in ocean chemistry due to acidification of a magnitude not seen in 65 million years,[41] putting many marine species—particularly calcifying species— at risk.

The NCA4 found that it is very likely (greater than 90 percent likelihood) that by mid-

[38] IPCC, 2021
[39] IPCC, 2013
[40] IPCC, 2021
[41] IPCC, 2018

century, the Arctic Ocean will be almost entirely free of sea ice by late summer for the first time in about 2 million years.[42] Coral reefs will be at risk for almost complete (99 percent) losses with 1°C (1.8°F) of additional warming from today (2°C or 3.6°F since preindustrial). At this temperature, between 8 and 18 percent of animal, plant, and insect species could lose over half of the geographic area with suitable climate for their survival, and 7 to 10 percent of rangeland livestock would be projected to be lost.[43]

Every additional increment of temperature comes with consequences. For example, the half degree of warming from 1.5 to 2°C (0.9 °F of warming from 2.7°F to 3.6°F) above preindustrial temperatures is projected on a global scale to expose 420 million more people to frequent extreme heatwaves, and 62 million more people to frequent exceptional heatwaves (where heatwaves are defined based on a heat wave magnitude index which takes into account duration and intensity – using this index, the 2003 French heat wave that led to almost 15,000 deaths would be classified as an "extreme heatwave" and the 2010 Russian heatwave which led to thousands of deaths and extensive wildfires would be classified as "exceptional"). It would increase the frequency of sea-ice-free Arctic summers from once in a hundred years to once in a decade. It could lead to 4 inches of additional sea level rise by the end of the century, exposing an additional 10 million people to risks of inundation, as well as increasing the probability of triggering instabilities in either the Greenland or Antarctic ice sheets. Between half a million and a million additional square miles of permafrost would thaw over several centuries. Risks to food security would increase from medium to high for several lower income regions in the Sahel,

[42] USGCRP, 2018
[43] IPCC, 2018

southern Africa, the Mediterranean, central Europe, and the Amazon. In addition to food security issues, this temperature increase would have implications for human health in terms of increasing ozone concentrations, heatwaves, and vector-borne diseases (for example, expanding the range of the mosquitoes which carry dengue fever, chikungunya, yellow fever, and the Zika virus, or the ticks which carry Lyme. babesiosis, or Rocky Mountain Spotted Fever).[44] Moreover, every additional increment in warming leads to larger changes in extremes, including the potential for events unprecedented in the observational record. Every additional degree will intensify extreme precipitation events by about 7 percent. The peak winds of the most intense tropical cyclones (hurricanes) are projected to increase with warming. In addition to a higher intensity, the IPCC found that precipitation and frequency of rapid intensification of these storms has already increased, while the movement speed has decreased, and elevated sea levels have increased coastal flooding, all of which make these tropical cyclones more damaging.[45]

The NCA4 also evaluated a number of impacts specific to the U.S. Severe drought and outbreaks of insects like the mountain pine beetle have killed hundreds of millions of trees in the western U.S. Wildfires have burned more than 3.7 million acres in 14 of the 17 years between 2000 and 2016, and Federal wildfire suppression costs were about a billion dollars annually.[46] The National Interagency Fire Center has documented U.S. wildfires since 1983, and the ten years with the largest acreage burned have all occurred since 2004.[47] Wildfire smoke degrades air quality increasing health risks, and more frequent and severe wildfires due to climate change

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[44] IPCC, 2018
[45] IPCC, 2021
[46] USGCRP, 2018
[47] NIFC (National Interagency Fire Center). 2021. Total wildland fires and acres (1983–2020). Accessed August 2021. www.nifc.gov/fireInfo/fireInfo_stats_totalFires.html.

would further diminish air quality, increase incidences of respiratory illness, impair visibility, and disrupt outdoor activities, sometimes thousands of miles from the location of the fire. Meanwhile, sea level rise has amplified coastal flooding and erosion impacts, requiring the installation of costly pump stations, flooding streets, and increasing storm surge damages. Tens of billions of dollars of U.S. real estate could be below sea level by 2050 under some scenarios. Increased frequency and duration of drought will reduce agricultural productivity in some regions, accelerate depletion of water supplies for irrigation, and expand the distribution and incidence of pests and diseases for crops and livestock. The NCA4 also recognized that climate change can increase risks to national security, both through direct impacts on military infrastructure, but also by affecting factors such as food and water availability that can exacerbate conflict outside U.S. borders. Droughts, floods, storm surges, wildfires, and other extreme events stress nations and people through loss of life, displacement of populations, and impacts on livelihoods.[48]

Some GHGs also have impacts beyond those mediated through climate change. For example, elevated concentrations of carbon dioxide stimulate plant growth (which can be positive in the case of beneficial species, but negative in terms of weeds and invasive species, and can also lead to a reduction in plant micronutrients[49]) and cause ocean acidification. Nitrous

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[48] USGCRP, 2018

[49] Ziska, L., A. Crimmins, A. Auclair, S. DeGrasse, J.F. Garofalo, A.S. Khan, I. Loladze, A.A. Pérez de León, A.Showler, J. Thurston, and I. Walls, 2016: Ch. 7: *Food Safety, Nutrition, and Distribution. The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. U.S. Global Change Research Program, Washington, DC, 189–216. http://dx.doi.org/10.7930/J0ZP4417

oxide depletes the levels of protective stratospheric ozone.[50]

As methane is the primary GHG addressed in this proposal, it is relevant to highlight some specific trends and impacts specific to methane. Concentrations of methane reached 1879 parts per billion (ppb) in 2020, more than two and a half times the preindustrial concentration of 722 ppb.[51] Moreover, the 2020 concentration was an increase of almost 13 ppb over 2019 - the largest annual increase in methane concentrations of the period since the early 1990s, continuing a trend of rapid rise since a temporary pause ended in 2007.[52] Methane has a high radiative efficiency – almost 30 times that of carbon dioxide per ppb (and therefore, 80 times as much per unit mass).[53] In addition, methane contributes to climate change through chemical reactions in the atmosphere that produce tropospheric ozone and stratospheric water vapor. Human emissions of methane are responsible for about one third of the warming due to well-mixed GHGs, the second most important human warming agent after carbon dioxide.[54] Because of the substantial emissions of methane, and its radiative efficiency, methane mitigation is one of the best opportunities for reducing near term warming.

The tropospheric ozone produced by the reaction of methane in the atmosphere has harmful effects for human health and plant growth in addition to its climate effects.[55] In remote

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[50] WMO (World Meteorological Organization), *Scientific Assessment of Ozone Depletion: 2018, Global Ozone Research and Monitoring Project* – Report No. 58, 588 pp., Geneva, Switzerland, 2018.
[51] Blunden et al., 2020
[52] NOAA, *https://gml.noaa.gov/webdata/ccgg/trends/ch4/ch4_annmean_gl.txt*, accessed August 19th, 2021.
[53] IPCC, 2021
[54] IPCC, 2021
[55] Nolte, C.G., P.D. Dolwick, N. Fann, L.W. Horowitz, V. Naik, R.W. Pinder, T.L. Spero, D.A. Winner, and L.H. Ziska, 2018: *Air Quality. In Impacts, Risks, and Adaptation in the United*

areas, methane is an important precursor to tropospheric ozone formation.[56] Approximately 50 percent of the global annual mean ozone increase since preindustrial times is believed to be due to anthropogenic methane.[57] Projections of future emissions also indicate that methane is likely to be a key contributor to ozone concentrations in the future.[58] Unlike NO_X and VOC, which affect ozone concentrations regionally and at hourly time scales, methane emissions affect ozone concentrations globally and on decadal time scales given methane's long atmospheric lifetime when compared to these other ozone precursors.[59] Reducing methane emissions, therefore, will contribute to efforts to reduce global background ozone concentrations that contribute to the incidence of ozone-related health effects.[60] The benefits of such reductions are global and occur in both urban and rural areas.

These scientific assessments and documented observed changes in the climate of the planet and of the U.S. present clear support regarding the current and future dangers of climate

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States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 512–538. doi: 10.7930/NCA4. 2018. CH13

[56] U.S. EPA. 2013. *"Integrated Science Assessment for Ozone and Related Photochemical Oxidants (Final Report)."* EPA-600-R-10-076F. National Center for Environmental Assessment—RTP Division. Available at *http://www.epa.gov/ncea/isa/.*

[57] Myhre, G., D. Shindell, F.-M. Bréon, W. Collins, J. Fuglestvedt, J. Huang, D. Koch, J.-F. Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura and H. Zhang, 2013: *Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Pg. 680.

[58] *Ibid.*

[59] *Ibid.*

[60] USGCRP, 2018

change and the importance of GHG mitigation.

2. VOC

Many VOC can be classified as HAP (*e.g.,* benzene[61]), which can lead to a variety of health concerns such as cancer and noncancer illnesses (*e.g.,* respiratory, neurological). Further, VOC are one of the key precursors in the formation of ozone. Tropospheric, or ground-level, ozone is formed through reactions of VOC and NO_X in the presence of sunlight. Ozone formation can be controlled to some extent through reductions in emissions of the ozone precursors VOC and NO_X. Recent observational and modeling studies have found that VOC emissions from oil and natural gas operations can impact ozone levels.[62,63,64,65] A significantly expanded body of scientific evidence shows that ozone can cause a number of harmful effects on health and the environment. Exposure to ozone can cause respiratory system effects such as difficulty breathing and airway inflammation. For people with lung diseases such as asthma and chronic obstructive pulmonary disease (COPD), these effects can lead to emergency room visits

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[61] Benzene Integrated Risk Information System (IRIS) Assessment: *https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=276.*

[62] Benedict, K. B., Zhou, Y., Sive, B. C., Prenni, A. J., Gebhart, K. A., Fischer, E. V., ... & Collett Jr, J. L. 2019. Volatile organic compounds and ozone in Rocky Mountain National Park during FRAPPE. *Atmospheric Chemistry and Physics*, *19*(1), 499-521.

[63] Lindaas, J., Farmer, D. K., Pollack, I. B., Abeleira, A., Flocke, F., & Fischer, E. V. 2019. Acyl peroxy nitrates link oil and natural gas emissions to high ozone abundances in the Colorado Front Range during summer 2015. *Journal of Geophysical Research: Atmospheres*, *124*(4), 2336-2350.

[64] McDuffie, E. E., Edwards, P. M., Gilman, J. B., Lerner, B. M., Dubé, W. P., Trainer, M., ... & Brown, S. S. 2016. Influence of oil and gas emissions on summertime ozone in the Colorado Northern Front Range. *Journal of Geophysical Research: Atmospheres*, *121*(14), 8712-8729.

[65] Tzompa- Sosa, Z. A., & Fischer, E. V. 2021. Impacts of emissions of C2- C5 alkanes from the US oil and gas sector on ozone and other secondary species. *Journal of Geophysical Research: Atmospheres*, *126*(1), e2019JD031935.

and hospital admissions. Studies have also found that ozone exposure is likely to cause premature death from lung or heart diseases. In addition, evidence indicates that long-term exposure to ozone is likely to result in harmful respiratory effects, including respiratory symptoms and the development of asthma. People most at risk from breathing air containing ozone include children; people with asthma and other respiratory diseases; older adults; and people who are active outdoors, especially outdoor workers. An estimated 25.9 million people have asthma in the U.S., including almost 7.1 million children. Asthma disproportionately affects children, families with lower incomes, and minorities, including Puerto Ricans, Native Americans/Alaska Natives, and African Americans.[66]

In the EPA's 2020 Integrated Science Assessment (ISA) for Ozone and Related Photochemical Oxidants[67], the EPA estimates the incidence of air pollution effects for those health endpoints above where the ISA classified as either causal or likely-to-be-causal. In brief, the ISA for ozone found short-term (less than one month) exposures to ozone to be causally related to respiratory effects, a "likely to be causal" relationship with metabolic effects and a "suggestive of, but not sufficient to infer, a causal relationship" for central nervous system effects, cardiovascular effects, and total mortality. The ISA reported that long-term exposures (one month or longer) to ozone are "likely to be causal" for respiratory effects including respiratory mortality, and a "suggestive of, but not sufficient to infer, a causal relationship" for cardiovascular effects, reproductive effects, central nervous system effects, metabolic effects,

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[66] National Health Interview Survey (NHIS) Data, 2011. *http://www.cdc.gov/asthma/nhis/2011/data.htm*.

[67] Integrated Science Assessment (ISA) for Ozone and Related Photochemical Oxidants (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-20/012, 2020.

and total mortality. An example of quantified incidence of ozone health effects can be found in the Regulatory Impact Analysis for the Final Revised Cross-State Air Pollution Rule (CSAPR) Update.

Scientific evidence also shows that repeated exposure to ozone can reduce growth and have other harmful effects on sensitive plants and trees. These types of effects have the potential to impact ecosystems and the benefits they provide.

3. SO_2

Current scientific evidence links short-term exposures to SO_2, ranging from 5 minutes to 24 hours, with an array of adverse respiratory effects including bronchoconstriction and increased asthma symptoms. These effects are particularly important for asthmatics at elevated ventilation rates (*e.g.,* while exercising or playing).

Studies also show an association between short-term exposure and increased visits to emergency departments and hospital admissions for respiratory illnesses, particularly in at-risk populations including children, the elderly, and asthmatics.

SO_2 in the air can also damage the leaves of plants, decrease their ability to produce food – photosynthesis – and decrease their growth. In addition to directly affecting plants, SO_2, when deposited on land and in estuaries, lakes, and streams, can acidify sensitive ecosystems resulting in a range of harmful indirect effects on plants, soils, water quality, and fish and wildlife (*e.g.,* changes in biodiversity and loss of habitat, reduced tree growth, loss of fish species). Sulfur deposition to waterways also plays a causal role in the methylation of mercury.[68]

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[68] U.S. EPA. *Integrated Science Assessment (ISA) for Oxides of Nitrogen and Sulfur Ecological Criteria* (2008 Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-08/082F, 2008.

B. Oil and Natural Gas Industry and Its Emissions

This section generally describes the structure of the Oil and Natural Gas Industry, the interconnected production, processing, transmission and storage, and distribution segments that move product from well to market, and types of emissions sources in each segment and the industry's emissions.

1. Oil and Natural Gas Industry – Structure

The EPA characterizes the oil and natural gas industry's operations as being generally composed of four segments: (1) Extraction and production of crude oil and natural gas ("oil and natural gas production"), (2) natural gas processing, (3) natural gas transmission and storage, and (4) natural gas distribution.[69, 70] The EPA regulates oil refineries as a separate source category; accordingly, as with the previous oil and gas NSPS rulemakings, for purposes of this proposed rulemaking, for crude oil, the EPA's focus is on operations from the well to the point of custody transfer at a petroleum refinery, while for natural gas, the focus is on all operations from the well to the local distribution company custody transfer station commonly referred to as the "city-gate."[71]

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[69] The EPA previously described an overview of the sector in section 2.0 of the 2011 Background Technical Support Document to 40 CFR part 60, subpart OOOO, located at Docket ID Item No. EPA-HQ-OAR-2010-0505-0045, and section 2.0 of the 2016 Background Technical Support Document to 40 CFR part 60, subpart OOOOa, located at Docket ID Item No. EPA-HQ-OAR-2010-0505-7631.

[70] While generally oil and natural gas production includes both onshore and offshore operations, 40 CFR part 60, subpart OOOOa addresses onshore operations.

[71] For regulatory purposes, the EPA defines the Crude Oil and Natural Gas source category to mean (1) Crude oil production, which includes the well and extends to the point of custody transfer to the crude oil transmission pipeline or any other forms of transportation; and (2) Natural gas production, processing, transmission, and storage, which include the well and extend to, but do not include, the local distribution company custody transfer station. The distribution segment is not part of the defined source category.

a. Production Segment

The oil and natural gas production segment includes the wells and all related processes used in the extraction, production, recovery, lifting, stabilization, and separation or treatment of oil and/or natural gas (including condensate). Although many wells produce a combination of oil and natural gas, wells can generally be grouped into two categories, oil wells and natural gas wells. Oil wells comprise two types, oil wells that produce crude oil only and oil wells that produce both crude oil and natural gas (commonly referred to as "associated" gas). Production equipment and components located on the well pad may include, but are not limited to, wells and related casing heads; tubing heads; "Christmas tree" piping, pumps, compressors; heater treaters; separators; storage vessels; pneumatic devices; and dehydrators. Production operations include well drilling, completion, and recompletion processes, including all the portable non-self-propelled apparatuses associated with those operations.

Other sites that are part of the production segment include "centralized tank batteries," stand-alone sites where oil, condensate, produced water, and natural gas from several wells may be separated, stored, or treated. The production segment also includes gathering pipelines, gathering and boosting compressor stations, and related components that collect and transport the oil, natural gas, and other materials and wastes from the wells to the refineries or natural gas processing plants.

Of these products, crude oil and natural gas undergo successive, separate processing. Crude oil is separated from water and other impurities and transported to a refinery via truck, railcar, or pipeline. As noted above, the EPA treats oil refineries as a separate source category, accordingly, for present purposes, the oil component of the production segment ends at the point

of custody transfer at the refinery.[72]

The separated, unprocessed natural gas is commonly referred to as field gas and is composed of methane, natural gas liquids (NGL), and other impurities, such as water vapor, H_2S, CO_2, helium, and nitrogen. Ethane, propane, butane, isobutane, and pentane are all considered NGL and often are sold separately for a variety of different uses. Natural gas with high methane content is referred to as "dry gas," while natural gas with significant amounts of ethane, propane, or butane is referred to as "wet gas." Natural gas typically is sent to gas processing plants in order to separate NGLs for use as feedstock for petrochemical plants, burned for space heating and cooking, or blended into vehicle fuel.

b. Processing Segment

The natural gas processing segment consists of separating certain hydrocarbons (HC) and fluids from the natural gas to produce "pipeline quality" dry natural gas. The degree and location of processing is dependent on factors such as the type of natural gas (*e.g.,* wet or dry gas), market conditions, and company contract specifications. Typically, processing of natural gas begins in the field and continues as the gas is moved from the field through gathering and boosting compressor stations to natural gas processing plants, where the complete processing of natural gas takes place. Natural gas processing operations separate and recover NGL or other non-methane gases and liquids from field gas through one or more of the following processes: oil and condensate separation, water removal, separation of NGL, sulfur and CO_2 removal, fractionation of NGL, and other processes, such as the capture of CO_2 separated from natural gas streams for delivery outside the facility.

[72] See 40 CFR part 60, subparts J and Ja and 40 CFR part 63, subparts CC and UUU.

c. Transmission and Storage Segment

Once natural gas processing is complete, the resulting natural gas exits the natural gas process plant and enters the transmission and storage segment where it is transmitted to storage and/or distribution to the end user.

Pipelines in the natural gas transmission and storage segment can be interstate pipelines, which carry natural gas across state boundaries, or intrastate pipelines, which transport the gas within a single state. Basic components of the two types of pipelines are the same, though interstate pipelines may be of a larger diameter and operated at a higher pressure. To ensure that the natural gas continues to flow through the pipeline, the natural gas must periodically be compressed, thereby increasing its pressure. Compressor stations perform this function and are usually placed at 40- to 100-mile intervals along the pipeline. At a compressor station, the natural gas enters the station, where it is compressed by reciprocating or centrifugal compressors.

Another part of the transmission and storage segment are aboveground and underground natural gas storage facilities. Storage facilities hold natural gas for use during peak seasons. The main difference between underground and aboveground storage sites is that storage takes place in storage vessels constructed of non-earthen materials in aboveground storage. Underground storage of natural gas typically occurs in depleted natural gas or oil reservoirs and salt dome caverns. One purpose of this storage is for load balancing (equalizing the receipt and delivery of natural gas). At an underground storage site, typically other processes occur, including compression, dehydration, and flow measurement.

d. Distribution Segment

The distribution segment provides the final step in delivering natural gas to customers.[73] The natural gas enters the distribution segment from delivery points located along interstate and intrastate transmission pipelines to business and household customers. The delivery point where the natural gas leaves the transmission and storage segment and enters the distribution segment is a local distribution company's custody transfer station, commonly referred to as the "city-gate." Natural gas distribution systems consist of over 2 million miles of piping, including mains and service pipelines to the customers. If the distribution network is large, compressor stations may be necessary to maintain flow; however, these stations are typically smaller than transmission compressor stations. Distribution systems include metering stations and regulating stations, which allow distribution companies to monitor the natural gas as it flows through the system.

2. Oil and Natural Gas Industry – Emissions

The oil and natural gas industry sector is the largest source of industrial methane emissions in the U.S.[74] Natural gas is comprised primarily of methane; every natural gas leak or intentional release through venting or other industrial processes constitutes a release of methane. Methane is a potent greenhouse gas; over a 100-year timeframe, it is nearly 30 times more powerful at trapping climate warming heat than CO_2, and over a 20-year timeframe, it is 83 times more powerful.[75] Because methane is a powerful greenhouse gas and is emitted in large quantities, reductions in methane emissions provide a significant benefit in reducing near-term warming. Indeed, one third of the warming due to GHGs that we are experiencing today is due to

[73] The distribution segment is not included in the definition of the Crude Oil and Natural Gas source category that is currently regulated under 40 CFR part 60, subpart OOOOa.
[74] H.R. Rep. No. 117-64, 4 (2021) (Report by the House Committee on Energy and Commerce concerning H.J. Res. 34, to disapprove the 2020 Policy Rule) (House Report).
[75] IPCC, 2021.

human emissions of methane. Additionally, the Crude Oil and Natural Gas sector emits, in varying concentrations and amounts, a wide range of other health-harming pollutants, including VOCs, SO_2, NO_X, H_2S, CS_2, and COS. The year 2016 modeling platform produced by USEPA estimated about 3 million tons of VOC are emitted by oil and gas-related sources.[76]

Emissions of methane and these co-pollutants occur in every segment of the Crude Oil and Natural Gas source category. Many of the processes and equipment types that contribute to these emissions are found in every segment of the source category and are highly similar across segments. Emissions from the crude oil portion of the regulated source category result primarily from field production operations, such as venting of associated gas from oil wells, oil storage vessels, and production-related equipment such as gas dehydrators, pig traps, and pneumatic devices. Emissions from the natural gas portion of the industry can occur in all segments. As natural gas moves through the system, emissions primarily result from intentional venting through normal operations, routine maintenance, unintentional fugitive emissions, flaring, malfunctions, and system upsets. Venting can occur through equipment design or operational practices, such as the continuous and intermittent bleed of gas from pneumatic controllers (devices that control gas flows, levels, temperatures, and pressures in the equipment). In addition to vented emissions, emissions can occur from leaking equipment (also referred to as fugitive emissions) in all parts of the infrastructure, including major production and processing equipment (*e.g.,* separators or storage vessels) and individual components (*e.g.,* valves or connectors). Flares are commonly used throughout each segment in the Oil and Natural Gas Industry as a control device to provide pressure relief to prevent risk of explosions and to destroy

[76] *https://www.epa.gov/sites/default/files/2020-11/documents/2016v1_emismod_tsd_508.pdf*

methane, which has a high global warming potential, and convert it to CO_2 which has a lower global warming potential, and to also control other air pollutants such as VOC.

"Super-emitting" events, sites, or equipment, where a small proportion of sources account for a large proportion of overall emissions, can occur throughout the Oil and Natural Gas Industry and have been observed to occur in the equipment types and activities covered by this proposed action. There are a number of definitions for the term "super-emitter." A 2018 National Academies of Sciences, Engineering, and Medicine report[77] on methane discussed three categories of "high-emitting" sources:

- Routine or "chronic" high-emitting sources, which regularly emit at higher rates relative to "peers" in a sample. Examples include large facilities, or large emissions at smaller facilities caused by poor design or operational practices.
- Episodic high-emitting sources, which are typically large in nature and are generally intentional releases from known maintenance events at a facility. Examples include gas well liquids unloading, well workovers and maintenance activities, and compressor station or pipeline blowdowns.
- Malfunctioning high-emitting sources, which can be either intermittent or prolonged in nature and result from malfunctions and poor work practices. Examples include malfunctioning intermittent pneumatic controllers and stuck open dump valves. Another example is well blowout events. For example, a 2018 well blowout in Ohio was estimated to have emitted over 60,000 tons of

[77] *https://www.nap.edu/download/24987#.*

methane.[78]

Super-emitters have been observed at many different scales, from site-level to component-level, across many research studies.[79] Studies will often develop a study-specific definition such as a top percentile of emissions in a study population (*e.g.*, top 10 percent), emissions exceeding a certain threshold (*e.g.*, 26 kg/day), emissions over a certain detection threshold (*e.g.*, 1-3 g/s) or as facilities with the highest proportional emission rate.[80] For certain equipment types and activities, the EPA's GHG emission estimates include the full range of conditions, including "super-emitters." For other situations, where data are available, emissions estimates for abnormal events are calculated separately and included in the Inventory of U.S. Greenhouse Gas Emissions and Sinks ("GHGI") (*e.g.*, Aliso Canyon leak event).[81] Given the

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[78] Pandey et al. (2019). Satellite observations reveal extreme methane leakage from a natural gas well blowout. PNAS December 26, 2019 116 (52) 26376-26381.

[79] See for example, Brandt, A., Heath, G., Cooley, D. (2016) *Methane leaks from natural gas systems follow extreme distributions*. Environ. Sci. Technol., DOI: 10.1021/acs.est.6b04303; Zavala-Araiza, D., Alvarez, R. A., Lyon, D. R., Allen, D. T., Marchese, A. J., Zimmerle, D. J., & Hamburg, S. P. (2017). *Super-emitters in natural gas infrastructure are caused by abnormal process conditions*. Nature communications, 8, 14012; Mitchell, A., et al. (2015), *Measurements of Methane Emissions from Natural Gas Gathering Facilities and Processing Plants: Measurement Results.* Environmental Science & Technology, 49(5), 3219-3227; Allen, D., et al. (2014), *Methane Emissions from Process Equipment at Natural Gas Production Sites in the United States: Pneumatic Controllers.* Environmental Science & Technology.

[80] Caulton et al. (2019). *Importance of Super-emitter Natural Gas Well Pads in the Marcellus Shale*. Environ. Sci. Technol. 2019, 53, 4747−4754; Zavala-Araiza, D., Alvarez, R., Lyon, D, et al. (2016). *Super-emitters in natural gas infrastructure are caused by abnormal process conditions*. Nat Commun 8, 14012 (2017). *https://www.nature.com/articles/ncomms14012*; Lyon, et al. (2016). *Aerial Surveys of Elevated Hydrocarbon Emissions from Oil and Gas Production Sites.* Environ. Sci. Technol. 2016, 50, 4877−4886. *https://pubs.acs.org/doi/10.1021/acs.est.6b00705*; and Zavala-Araiza D, et al. (2015). *Toward a functional definition of methane superemitters: Application to natural gas production sites*. 49 ENVTL. SCI. & TECH. 8167, 8168 (2015). *https://pubs.acs.org/doi/10.1021/acs.est.5b00133*.

[81] The EPA's emission estimates in the GHGI are developed with the best data available at the time of their development, including data from GHGRP subpart W and from recent research

variability of practices and technologies across oil and gas systems and the occurrence of episodic events, it is possible that the EPA's estimates do not include all methane emissions from abnormal events. The EPA continues to work through its stakeholder process to review new data from the EPA's Greenhouse Gas Reporting Program ("GHGRP") petroleum and natural gas systems source category (40 CFR part 98, subpart W, also referred to as "GHGRP subpart W") and research studies to assess how emissions estimates can be improved. Because lost gas, whether through fugitive emissions, unintentional gas carry through, or intentional releases, represents lost earning potential, the industry benefits from capturing and selling emissions of natural gas (and methane). Limiting super-emitters through actions included in this rule such as reducing fugitive emissions, using lower emitting equipment where feasible, and employing best management practices will not only reduce emissions but reduce the loss of revenue from this valuable commodity.

Below we provide estimated emissions of methane, VOC, and SO_2 from Oil and Natural Gas Industry operation sources.

Methane emissions in the U.S. and from the Oil and Natural Gas industry. Official U.S. estimates of national level GHG emissions and sinks are developed by the EPA for the GHGI in fulfillment of commitments under the United Nations Framework Convention on Climate Change. The GHGI, which includes recent trends, is organized by industrial sector. The oil and

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studies. GHGRP subpart W emissions data used in the GHGI are quantified by reporters using direct measurements, engineering calculations, or emission factors, as specified by the regulation. The EPA has a multi-step data verification process for GHGRP subpart W data, including automatic checks during data-entry, statistical analyses on completed reports, and staff review of the reported data. Based on the results of the verification process, the EPA follows up with facilities to resolve mistakes that may have occurred.

natural gas production, natural gas processing, and natural gas transmission and storage sectors emit 28 percent of U.S. anthropogenic methane. Table 7 below presents total U.S. anthropogenic methane emissions for the years 1990, 2010, and 2019.

In accordance with the practice of the EPA GHGI, the EPA GHGRP, and international reporting standards under the UN Framework Convention on Climate Change, the 2007 IPCC Fourth Assessment Report value of the methane 100-year GWP is used for weighting emissions in the following tables. The 100-year GWP value of 25 for methane indicates that one ton of methane has approximately as much climate impact over a 100-year period as 25 tons of carbon dioxide. The most recent IPCC AR6 assessment has estimated a slightly larger 100-year GWP of methane of almost 30 (specifically, either 27.2 or 29.8 depending on whether the value includes the carbon dioxide produced by the oxidation of methane in the atmosphere). As mentioned earlier, because methane has a shorter lifetime than carbon dioxide, the emissions of a ton of methane will have more impact earlier in the 100-year timespan and less impact later in the 100-year timespan relative to the emissions of a 100-year GWP-equivalent quantity of carbon dioxide: when using the AR6 20-year GWP of 81, which only looks at impacts over the next 20 years, the total US emissions of methane in 2019 would be equivalent to about 2140 MMT CO_2.

TABLE 7. U.S. METHANE EMISSIONS BY SECTOR (MILLION METRIC TONS CARBON DIOXIDE EQUIVALENT (MMT CO_2 EQ.))

Sector	1990	2010	2019
Oil and Natural Gas Production, and Natural Gas Processing and Transmission and Storage	189	176	182
Landfills	177	124	114
Enteric Fermentation	165	172	179

Coal Mining	96	82	47
Manure Management	37	55	62
Other Oil and Gas Sources	46	17	15
Wastewater Treatment	20	19	18
Other Methane Sources[82]	46	47	42
Total Methane Emissions	777	692	660

Emissions from the Inventory of United States Greenhouse Gas Emissions and Sinks: 1990-2019 (published April 14, 2021), calculated using GWP of 25. Note: Totals may not sum due to rounding.

Table 8 below presents total methane emissions from natural gas production through transmission and storage and petroleum production, for years 1990, 2010, and 2019, in MMT CO_2 Eq. (or million metric tons CO_2 Eq.) of methane.

TABLE 8. U.S. METHANE EMISSIONS FROM NATURAL GAS AND PETROLEUM SYSTEMS (MMT CO_2 EQ.)

Sector	1990	2010	2019
Natural Gas Production	63	97	94
Natural Gas Processing	21	10	12
Natural Gas Transmission and Storage	57	30	37
Petroleum Production	48	39	38

Emissions from the Inventory of United States Greenhouse Gas Emissions and Sinks: 1990-2019 (published April 14, 2021), calculated using GWP of 25. Note: Totals may not sum due to rounding.

[82] Other sources include rice cultivation, forest land, stationary combustion, abandoned oil and natural gas wells, abandoned coal mines, mobile combustion, composting, and several sources emitting less than 1 MMT CO_2 Eq. in 2019.

Global GHG Emissions. For additional background information and context, we used 2018 World Resources Institute Climate Watch data to make comparisons between U.S. oil and natural gas production and natural gas processing and transmission and storage emissions and the emissions inventories of entire countries and regions.[83] The U.S. methane emissions from oil and natural gas production and natural gas processing and transmission and storage constitute 0.4 percent of total global emissions of all GHGs (48,601 MMT CO2 Eq.) from all sources.[84] Ranking U.S. emissions of methane from oil and natural gas production and natural gas processing and transmission and storage against total GHG emissions for entire countries (using 2018 Climate Watch data), shows that these emissions are comparatively large as they exceed the national-level emissions totals for all GHGs and all anthropogenic sources for Colombia, the Czech Republic, Chile, Belgium, and over 160 other countries. What that means is that the U.S. emits more of a single GHG—methane—from a single sector—the oil and gas sector—than the total combined GHGs emitted by 164 out of 194 total countries. Furthermore, U.S. emissions of methane from oil and natural gas production and natural gas processing and transmission and storage are greater than the sum of total emissions of 64 of the lowest-emitting countries and territories, using the 2018 Climate Watch data set.

As illustrated by the domestic and global GHGs comparison data summarized above, the collective GHG emissions from the Crude Oil and Natural Gas source category are significant,

[83] The Climate Watch figures presented here come from the PIK PRIMAP-hist dataset included on Climate Watch. The PIK PRIMAP-hist dataset combines UNFCCC reported data where available and fills gaps with other sources. It does not include land use change and forestry but covers all other sectors. *https://www.climatewatchdata.org/ghg-emissions?end_year=2018&source=PIK&start_year=1990*

whether the comparison is domestic (where this sector is the largest source of methane emissions, accounting for 28 percent of U.S. methane and 3 percent of total U.S. emissions of all GHGs), global (where this sector, accounting for 0.4 percent of all global GHG emissions, emits more than the total national emissions of over 160 countries, and combined emissions of over 60 countries), or when both the domestic and global GHG emissions comparisons are viewed in combination. Consideration of the global context is important. GHG emissions from U.S. Oil and Natural Gas production and natural gas processing and transmission and storage will become globally well-mixed in the atmosphere, and thus will have an effect on the U.S. regional climate, as well as the global climate as a whole for years and indeed many decades to come. No single GHG source category dominates on the global scale. While the Crude Oil and Natural Gas source category, like many (if not all) individual GHG source categories, could appear small in comparison to total emissions, in fact, it is a very important contributor in terms of both absolute emissions, and in comparison to other source categories globally or within the U.S.

The IPCC AR6 assessment determined that "From a physical science perspective, limiting human-induced global warming to a specific level requires limiting cumulative CO_2 emissions, reaching at least net zero CO_2 emissions, along with strong reductions in other GHG emissions." The report also singled out the importance of "strong and sustained CH_4 emission reductions" in part due to the short lifetime of methane leading to the near-term cooling from reductions in methane emissions, which can offset the warming that will result due to reductions in emissions of cooling aerosols such as SO_2. Therefore, reducing methane emissions globally is an important facet in any strategy to limit warming. In the oil and gas sector, methane reductions are highly achievable and cost-effective using existing and well-known solutions and

technologies that actually result in recovery of saleable product.

VOC and SO_2 emissions in the U.S. and from the oil and natural gas industry. Official U.S. estimates of national level VOC and SO_2 emissions are developed by the EPA for the National Emissions Inventory (NEI), for which States are required to submit information under 40 CFR part 51, subpart A. Data in the NEI may be organized by various data points, including sector, NAICS code, and Source Classification Code. Tables 9 and 10 below present total U.S. VOC and SO_2 emissions by sector, respectively, for the year 2017, in kilotons (kt) (or thousand metric tons). The oil and natural gas sector represents the top anthropogenic U.S. sector for VOC emissions after removing the biogenics and wildfire sectors in Table 9 (about 20% of the total VOC emitting by anthropogenic sources). About 2.5 percent of the total U.S. anthropogenic SO2 comes from the oil and natural gas sector.

TABLE 9. U.S. VOC EMISSIONS BY SECTOR (kt)

Sector	2017
Biogenics – Vegetation and Soil	25,823
Fires – Wildfires	4,578
Oil and Natural Gas Production, and Natural Gas Processing and Transmission	2,504
Fires – Prescribed Fires	2,042
Solvent – Consumer and Commercial Solvent Use	1,610
Mobile – On-Road non-Diesel Light Duty Vehicles	1,507
Mobile – Non-Road Equipment – Gasoline	1,009
Other VOC Sources[85]	4,045
Total VOC Emissions	43,118

Emissions from the 2017 NEI (released April 2020). Note: Totals may not sum due to rounding.

TABLE 10. U.S. SO_2 EMISSIONS BY SECTOR (kT)

Sector	2017
Fuel Combustion – Electric Generation – Coal	1,319
Fuel Combustion – Industrial Boilers, Internal Combustion Engines – Coal	212
Mobile – Commercial Marine Vessels	183

[85] Other sources include remaining sources emitting less than 1,000 kt VOC in 2017.

Industrial Processes – Not Elsewhere Classified	138
Fires – Wildfires	135
Industrial Processes – Chemical Manufacturing	123
Oil and Natural Gas Production and Natural Gas Processing and Transmission	65
Other SO_2 Sources[86]	551
Total SO_2 Emissions	2,726

Emissions from the 2017 NEI (released April 2020). Note: Totals may not sum due to rounding.

Table 11 below presents total VOC and SO_2 emissions from oil and natural gas production through transmission and storage, for the year 2017, in kt. The contribution to the total anthropogenic VOC emissions budget from the oil and gas sector has been increasing in recent NEI cycles. In the 2017 NEI, the oil and gas sector makes up about 25 percent of the total VOC emissions from anthropogenic sources. The SO_2 emissions have been declining in just about every anthropogenic sector, but the oil and gas sector is an exception where SO_2 emissions have been slightly increasing or remaining steady in some cases in recent years.

TABLE 11. U.S. VOC AND SO_2 EMISSIONS FROM NATURAL GAS AND PETROLEUM SYSTEMS (kt)

Sector	VOC	SO_2
Oil and Natural Gas Production	2,478	41
Natural Gas Processing	12	23
Natural Gas Transmission and Storage	14	1

Emissions from the 2017 NEI, (published April 2020), in kt (or thousand metric tons). Note: Totals may not sum due to rounding.

IV. Statutory Background and Regulatory History

A. Statutory Background of CAA Sections 111(b), 111(d) and General Implementing Regulations

The EPA's authority for this rule is CAA section 111, which governs the establishment of standards of performance for stationary sources. This section requires the EPA to list source

[86] Other sources include remaining sources emitting less than 100 kt SO_2 in 2017.

categories to be regulated, establish standards of performance for air pollutants emitted by new sources in that source category, and establish EG for States to establish standards of performance for certain pollutants emitted by existing sources in that source category.

Specifically, CAA section 111(b)(1)(A) requires that a source category be included on the list for regulation if, "in [the EPA Administrator's] judgment it causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare." This determination is commonly referred to as an "endangerment finding" and that phrase encompasses both of the "causes or contributes significantly to" component and the "endanger public health or welfare" component of the determination. Once a source category is listed, CAA section 111(b)(1)(B) requires that the EPA propose and then promulgate "standards of performance" for new sources in such source category. CAA section 111(a)(1) defines a "standard of performance" as "a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated." As long recognized by the D.C. Circuit, "[b]ecause Congress did not assign the specific weight the Administrator should accord each of these factors, the Administrator is free to exercise his discretion in this area." *New York v. Reilly,* 969 F.2d 1147, 1150 (D.C.Cir.1992). *See also Lignite Energy Council v. EPA*, 198 F.3d 930, 933 (D.C. Cir. 1999) ("*Lignite Energy Council*") ("Because section 111 does not set forth the weight that be [sic] should assigned to each of these factors, we have granted the agency a great degree of discretion in balancing them").

In determining whether a given system of emission reduction qualifies as "the best system of emission reduction… adequately demonstrated," or "BSER," CAA section 111(a)(1) requires that the EPA take into account, among other factors, "the cost of achieving such reduction." As described in the proposal for the 2016 Rule,[87] the U.S. Court of Appeals for the District of Columbia Circuit (the D.C. Circuit) has stated that in light of this provision, the EPA may not adopt a standard the cost of which would be "exorbitant,"[88] "greater than the industry could bear and survive,"[89] "excessive,"[90] or "unreasonable."[91] These formulations appear to be synonymous, and for convenience, in this rulemaking, as in previous rulemakings, we will use reasonableness as the standard, so that a control technology may be considered the ''best system of emission reduction . . . adequately demonstrated'' if its costs are reasonable, but cannot be considered the BSER if its costs are unreasonable. See 80 FR 64662, 64720-21 (October 23, 2015).

CAA section 111(a) does not provide specific direction regarding what metric or metrics to use in considering costs, affording the EPA considerable discretion in choosing a means of cost consideration.[92] In this rulemaking, we evaluated whether a control cost is reasonable under a number of approaches that we find appropriate for assessing the types of controls at issue. For example, in evaluating controls for reducing VOC and methane emissions from new sources, we

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[87] 80 FR 56593, 56616 (September 18, 2015).
[88] *Lignite Energy Council,* 198 F.3d at 933.
[89] *Portland Cement Ass'n* v. *EPA,* 513 F.2d 506, 508 (D.C. Cir. 1975).
[90] *Sierra Club* v. *Costle,* 657 F.2d 298, 343 (D.C. Cir. 1981).
[91] *Id.*
[92] See, *e.g., Husqvarna AB* v. *EPA,* 254 F.3d 195, 200 (D.C. Cir. 2001) (where CAA section 213 does not mandate a specific method of cost analysis, the EPA may make a reasoned choice as to how to analyze costs).

considered a control's cost effectiveness under both a "single pollutant cost-effectiveness" approach and a "multipollutant cost-effectiveness" approach, in order to appropriately take into account that the systems of emission reduction considered in this rule typically achieve reductions in multiple pollutants at once and secure a multiplicity of climate and public health benefits.[93] We also evaluated costs at a sector level by assessing the projected new capital expenditures required under the proposal (compared to overall new capital expenditures by the sector) and the projected compliance costs (compared to overall annual revenue for the sector) if the rule were to require such controls. For a detailed discussion of these cost approaches, please see section IX of the proposal preamble.

As defined in CAA section 111(a), the "standard of performance" that the EPA develops, based on the BSER, is expressed as a performance level (typically, a rate-based standard). CAA section 111(b)(5) precludes the EPA from prescribing a particular technological system that must be used to comply with a standard of performance. Rather, sources can select any measure or combination of measures that will achieve the standard.

CAA section 111(h)(1) authorizes the Administrator to promulgate "a design, equipment, work practice, or operational standard, or combination thereof" if in his or her judgment, "it is not feasible to prescribe or enforce a standard of performance." CAA section 111(h)(2) provides the circumstances under which prescribing or enforcing a standard of performance is "not

[93] We believe that both the single and multipollutant approaches are appropriate for assessing the reasonableness of the multipollutant controls considered in this action. The EPA has considered similar approaches in the past when considering multiple pollutants that are controlled by a given control option. See *e.g.,* 80 FR 56616-56617; 73 FR 64079-64083 and EPA Document ID Nos. EPA-HQ-OAR-2004-0022-0622, EPA-HQ-OAR-2004-0022-0447, EPA-HQ-OAR-2004-0022-0448.

feasible," such as, when the pollutant cannot be emitted through a conveyance designed to emit or capture the pollutant, or when there is no practicable measurement methodology for the particular class of sources.[94] CAA section 111(b)(1)(B) requires the EPA to "at least every 8 years review and, if appropriate, revise" performance standards unless the "Administrator determines that such review is not appropriate in light of readily available information on the efficacy" of the standard.

As mentioned above, once the EPA lists a source category under CAA section 111(b)(1)(A), CAA section 111(b)(1)(B) provides the EPA discretion to determine the pollutants and sources to be regulated. In addition, concurrent with the 8-year review (and though not a mandatory part of the 8-year review), the EPA may examine whether to add standards for pollutants or emission sources not currently regulated for that source category.

Once the EPA establishes NSPS in a particular source category, the EPA is required in certain circumstances to issue EG to reduce emissions from existing sources in that same source category. Specifically, CAA section 111(d) requires that the EPA prescribe regulations to establish procedures under which States submit plans to establish, implement, and enforce standards of performance for existing sources for certain air pollutants to which a Federal NSPS would apply if such existing source were a new source. The EPA addresses this CAA

[94] The EPA notes that design, equipment, work practice or operational standards established under CAA section 111(h) (commonly referred to as "work practice standards") reflect the "best technological system of continuous emission reduction" and that this phrasing differs from the "best system of emission reduction" phrase in the definition of "standard of performance" in CAA section 111(a)(1). Although the differences in these phrases may be meaningful in other contexts, for purposes of evaluating the sources and systems of emission reduction at issue in this rulemaking, the EPA has applied these concepts in an essentially comparable manner.

requirement both through its promulgation of general implementing regulations for section 111(d) as well as specific EG. The EPA first published general implementing regulations in 1975, 40 FR 53340 (November 17, 1975) (codified at 40 CFR part 60, subpart B), and has revised its section 111(d) implementing regulations several times, most recently on July 8, 2019, 84 FR 32520 (codified at 40 CFR pt. 60, subpart Ba).[95] In accordance with CAA section 111(d), States are required to submit plans pursuant to these regulations to establish standards of performance for existing sources for any air pollutant: (1) The emission of which is subject to a Federal NSPS; and (2) which is neither a pollutant regulated under CAA section 108(a) (*i.e.*, criteria pollutants such as ground-level ozone and particulate matter, and their precursors, like VOC[96]) or a HAP regulated under CAA section 112. See also definition of "designated pollutant" in 40 CFR 60.21a(a). The EPA's general implementing regulations use the term "designated facility" to identify those existing sources that may be subject to regulation under this provision of CAA section 111(d). See 40 CFR 60.21a(b).

While States are authorized to establish standards of performance for designated facilities, there is a fundamental obligation under CAA section 111(d) that such standards of performance reflect the degree of emission limitation achievable through the application of the

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[95] Subpart Ba provides for the applicability of its provisions upon final publication of an EG if such EG is published after July 8, 2019. 60.20a(a). The EPA acknowledges that the D.C. Circuit has vacated certain timing provisions within Subpart Ba. *Am. Lung Assoc. v. EPA*, 985 F.3d 914 (D.C. Cir. 2021), *petition for cert. pending*, No. 20-1778 (filed June 23, 2001) (*Am. Lung Assoc.*). However, the court did not vacate the applicability provision, therefore Subpart Ba applies to any EG finalized from this proposal. The Agency plans to undertake rulemaking to address the provisions vacated under the court's decision in the near future.

[96] VOC are not listed as CAA section 108(a) pollutants, but they are regulated precursors to photochemical oxidants (*e,g.*, ozone) and particulate matter (PM), both of which are listed CAA section 108(a) pollutants, and VOC therefore fall within the CAA 108(a) exclusion. Accordingly, promulgation of NSPS for VOC does not trigger the application of CAA section 111(d).

BSER, as determined by the Administrator. This obligation derives from the definition of "standard of performance" under CAA section 111(a)(1), which makes no distinction between new-source and existing-source standards. The EPA identifies the degree of emission limitation achievable through application of the BSER as part of its EG. See 40 CFR 60.22a(b)(5). While standards of performance must generally reflect the degree of emission limitation achievable through application of the BSER, CAA section 111(d)(1) also requires that the EPA regulations permit the States, in applying a standard of performance to a particular source, to take into account the source's remaining useful life and other factors.

After the EPA issues final EG per the requirements under CAA section 111(d) and 40 CFR part 60, subpart Ba, States are required to submit plans that establish standards of performance for the designated facilities as defined in the EPA's guidelines and that contain other measures to implement and enforce those standards. The EPA's final EG issued under CAA section 111(d) do not impose binding requirements directly on sources, but instead provide requirements for States in developing their plans and criteria for assisting the EPA when judging the adequacy of such plans. Under CAA section 111(d), and the EPA's implementing regulations, a State must submit its plan to the EPA for approval, the EPA will evaluate the plan for completeness in accordance with enumerated criteria, and then will act on that plan via a rulemaking process to either approve or disapprove the plan in whole or in part. If a State does not submit a plan, or if the EPA does not approve a State's plan because it is not "satisfactory," then the EPA must establish a Federal plan for that State.[97] If EPA approves a State's plan, the provisions in the state plan become federally enforceable against the designated facility

[97] CAA section 111(d)(2)(A).

responsible for compliance in the same manner as the provisions of an approved State implementation plan under CAA section 110. If no designated facility is located within a State, the State must submit to the EPA a letter certifying to that effect in lieu of submitting a State plan. See 40 CFR 60.23a(b).

Designated facilities located in Indian country would not be addressed by a State's CAA section 111(d) plan. Instead, an eligible Tribe that has one or more designated facilities located in its area of Indian country[98] would have the opportunity, but not the obligation, to seek authority and submit a plan that establishes standards of performance for those facilities on its Tribal lands.[99] If a Tribe does not submit a plan, or if the EPA does not approve a Tribe's plan, then the EPA has the authority to establish a Federal plan for that Tribe.[100]

B. What is the regulatory history and litigation background of NSPS and EG for the oil and natural gas industry?

1. 1979 Listing of Source Category

Subsequent to the enactment of the CAA of 1970, the EPA took action to develop standards of performance for new stationary sources as directed by Congress in CAA section 111. By 1977, the EPA had promulgated NSPS for a total of 27 source categories, while NSPS for an additional 25 source categories were then under development.[101] However, in amending the CAA that year, Congress expressed dissatisfaction that the EPA's pace was too slow. Accordingly, the 1977 CAA Amendments included a new subsection (f) in section 111, which specified a schedule for the EPA to list additional source categories under CAA section

[98] The EPA is aware of many oil and natural gas operations located in Indian Country.
[99] See 40 CFR part 49, subpart A.
[100] CAA section 111(d)(2)(A).
[101] See 44 FR 49222 (August 21, 1979).

111(b)(1)(A) and prioritize them for regulation under CAA section 111(b)(1)(B).

In 1979, as required by CAA section 111(f), the EPA published a list of source categories, which included "*Crude Oil and Natural Gas Production*," for which the EPA would promulgate standards of performance under CAA section 111(b). See *Priority List and Additions to the List of Categories of Stationary Sources*, 44 FR 49222 (August 21, 1979) ("1979 Priority List"). That list included, in the order of priority for promulgating standards, source categories that the EPA Administrator had determined, pursuant to CAA section 111(b)(1)(A), contribute significantly to air pollution that may reasonably be anticipated to endanger public health or welfare. See 44 FR 49223 (August 21, 1979); see also 49 FR 2636-37 (January 20, 1984).

2. 1985 NSPS for VOC and SO_2 Emissions from Natural Gas Processing Units

On June 24, 1985 (50 FR 26122), the EPA promulgated NSPS for the Crude Oil and Natural Gas source category that addressed VOC emissions from equipment leaks at onshore natural gas processing plants (40 CFR part 60, subpart KKK). On October 1, 1985 (50 FR 40158), the EPA promulgated additional NSPS for the source category to regulate SO_2 emissions from onshore natural gas processing plants (40 CFR part 60, subpart LLL).

3. 2012 NSPS OOOO Rule and Related Amendments

In 2012, pursuant to its duty under CAA section 111(b)(1)(B) to review and, if appropriate, revise the 1985 NSPS, the EPA published the final rule, "*Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution*," 77 FR 49490 (August 16, 2012) (40 CFR part 60, subpart OOOO) ("2012 NSPS OOOO"). The 2012 rule updated the SO_2 standards for sweetening units and the VOC standards for equipment leaks at onshore natural gas processing plants. In addition, it established VOC standards for several oil

and natural gas-related operations emission sources not covered by 40 CFR part 60, subparts KKK and LLL, including natural gas well completions, centrifugal and reciprocating compressors, certain natural gas operated pneumatic controllers in the production and processing segments of the industry, and storage vessels in the production, processing, and transmission and storage segments.

In 2013, 2014, and 2015 the EPA amended the 2012 NSPS OOOO rule in order to address implementation of the standards. "*Oil and Natural Gas Sector: Reconsideration of Certain Provisions of New Source Performance Standards*," 78 FR 58416 (September 23, 2013) ("2013 NSPS OOOO") (concerning storage vessel implementation); "*Oil and Natural Gas Sector: Reconsideration of Additional Provisions of New Source Performance Standards*," 79 FR 79018 (December 31, 2014) ("2014 NSPS OOOO") (concerning well completion); "*Oil and Natural Gas Sector: Definitions of Low Pressure Gas Well and Storage Vessel*," 80 FR 48262 (August 12, 2015) ("2015 NSPS OOOO") (concerning low pressure gas wells and storage vessels).

The EPA received petitions for both judicial review and administrative reconsiderations for the 2012, 2013, and 2014 NSPS OOOO rules. The EPA denied reconsideration for some issues, see *"Reconsideration of the Oil and Natural Gas Sector: New Source Performance Standards; Final Action,"* 81 FR 52778 (August 10, 2016), and, as noted below, granted reconsideration for other issues. As explained below, all litigation related to NSPS OOOO is currently in abeyance.

4. 2016 NSPS OOOOa Rule and Related Amendments

Regulatory action. On June 3, 2016, the EPA published a final rule titled "*Oil and*

Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources; Final Rule," at 81 FR 35824 (40 CFR part 60, subpart OOOOa) ("2016 NSPS OOOOa").[102,103] The 2016 NSPS OOOOa rule established NSPS for sources of GHGs and VOC emissions for certain equipment, processes, and operations across the Oil and Natural Gas Industry, including in the transmission and storage segment. 81 FR at 35832. The EPA explained that the 1979 listing identified the source category broadly enough to include that segment and, in the alternative, if the listing had limited the source category to the production and processing segments, the EPA affirmatively expanded the source category to include the transmission and storage segment on grounds that operations in those segments are a sequence of functions that are interrelated and necessary for getting the recovered gas ready for distribution. 81 FR at 35832. In addition, because this rule was the first time that the EPA had promulgated NSPS for GHG emissions from the Crude Oil and Natural Gas source category, the EPA predicated those NSPS on a determination that it had a rational basis to regulate GHG emissions from the source category. 81 FR at 35843. In response to comments, the EPA explained that it was not required to make an additional pollutant-specific finding that GHG emissions from the source category contribute significantly to dangerous air pollution, but in the alternative, the EPA did make such a finding, relying on the same information that it relied on when determining that it had a rational basis to

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[102] The June 3, 2016, rulemaking also included certain final amendments to 40 CFR part 60, subpart OOOO to address issues on which the EPA had granted reconsideration.

[103] The EPA review which resulted in the 2016 NSPS OOOOa rule was instigated by a series of directives from then-President Obama targeted at reducing GHGs, including methane: the President's *Climate Action Plan* (June 2013); the President's *Climate Action Plan: Strategy to Reduce Methane Emissions* ("Methane Strategy") (March 2014); and the President's goal to address, propose and set standards for methane and ozone-forming emissions from new and modified sources in the sector (January 2015, *https://obamawhitehouse.archives.gov/the-press-office/2015/01/14/fact-sheet-Administration-takes-steps-forward-climate-action-plan-anno-1*).

promulgate a GHGs NSPS. 81 FR at 35843.

Specifically, the 2016 NSPS OOOOa addresses the following emission sources:

- Sources that were unregulated under the 2012 NSPS OOOO (hydraulically fractured oil well completions, pneumatic pumps, and fugitive emissions from well sites and compressor stations);
- Sources that were regulated under the 2012 NSPS OOOO for VOC emissions, but not for GHG emissions (hydraulically fractured gas well completions and equipment leaks at natural gas processing plants); and
- Certain equipment that is used across the source category, of which the 2012 NSPS OOOO regulated emissions of VOC from only a subset (pneumatic controllers, centrifugal compressors, and reciprocating compressors, with the exception of those compressors located at well sites).

On March 12, 2018, the EPA finalized amendments to certain aspects of the 2016 NSPS OOOOa requirements for the collection of fugitive emission components at well sites and compressor stations, specifically (1) the requirement that components on a delay of repair must conduct repairs during unscheduled or emergency vent blowdowns, and (2) the monitoring survey requirements for well sites located on the Alaska North Slope.

Petitions for judicial review and to reconsider. Following promulgation of the 2016 NSPS OOOOa rule, several states and industry associations challenged the rule in the D.C. Circuit. The Administrator also received five petitions for reconsideration of several provisions of the final rule. Copies of the petitions are posted in Docket ID No. EPA-HQ-OAR-2010-

0505.[104] As noted below, the EPA granted reconsideration as to several issues raised with respect to the 2016 NSPS OOOOa rule and finalized certain modifications discussed in the next section. As explained below, all litigation challenging the 2016 NSPS OOOOa rule is currently stayed.

5. 2020 Policy and Technical Rules

Regulatory action. In September 2020, the EPA published two final rules to amend 2012 NSPS OOOO and 2016 NSPS OOOOa. The first is titled, *"Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review."* 85 FR 57018 (September 14, 2020). Commonly referred to as the 2020 Policy Rule, it first rescinded the regulations applicable to the transmission and storage segment on the basis that the 1979 listing limited the source category to the production and processing segments and that the transmission and storage segment is not "sufficiently related" to the production and processing segments, and therefore cannot be part of the same source category. 85 FR at 57027, 57029. In addition, the 2020 Policy Rule rescinded methane requirements for the industry's production and processing segments on two separate bases. The first was that such standards are redundant to VOC standards for these segments. 85 FR at 57030. The second was that the rule interpreted section 111 to require, or at least authorize the Administrator to require, a pollutant-specific "significant contribution finding" (SCF) as a prerequisite to a NSPS for a pollutant, and to require that such finding be supported by some identified standard or established set of criteria for determining which contributions are "significant." 85 FR at 57034. The rule went on to conclude that the

[104] See Docket ID Item Nos.: EPA-HQ-OAR-2010-0505-7682, EPA-HQ-OAR-2010-0505-7683, EPA-HQ-OAR-2010-0505-7684, EPA-HQ-OAR-2010-0505-7685, EPA-HQ-OAR-2010-0505-7686.

alternative significant-contribution finding that the EPA made in the 2016 Rule for GHG emissions was flawed because it accounted for emissions from the transmission and storage segment and because it was not supported by criteria or a threshold. 85 FR at 57038.[105]

Published on September 15, 2020, the second of the two rules is titled, *"Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Reconsideration."* Commonly referred to as the 2020 Technical Rule, this second rule made further amendments to the 2016 NSPS OOOOa following the 2020 Policy Rule to eliminate or reduce certain monitoring obligations and to address a range of issues in response to administrative petitions for reconsideration and other technical and implementation issues brought to the EPA's attention since the 2016 NSPS OOOOa rulemaking. Specifically, the 2020 Technical Rule exempted low-production well sites from fugitives monitoring (previously required semiannually), required semiannual monitoring at gathering and boosting compressor stations (previously quarterly), streamlined recordkeeping and reporting requirements, allowed compliance with certain equivalent State requirements as an alternative to NSPS fugitive requirements, streamlined the application process to request the use of new technologies to monitor for fugitive emissions, addressed storage tank batteries for applicability determination purposes and finalized several technical corrections. Because the 2020 Technical Rule was issued the day after the EPA's rescission of methane regulations in the 2020 Policy Rule, the

[105] Following the promulgation of the 2020 Policy Rule, the EPA promulgated a final rule that identified a standard or criteria for determining which contributions are "significant," which the D.C. Circuit vacated. *"Pollutant-Specific Significant Contribution Finding for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units, and Process for Determining Significance of Other New Source Performance Standards Source Categories."* 86 Fed. Reg. 2542 (Jan. 13, 2021), vacated by *California v. EPA,* No. 21-1035 (D.C. Cir.) (Order, April 5, 2021, Doc. #1893155).

amendments made in the 2020 Technical Rule applied only to the requirements to regulate VOC emissions from this source category. The 2020 Policy Rule amended 40 CFR part 60, subparts OOOO and OOOOa, as finalized in 2016. The 2020 Technical Rule amended the 40 CFR part 60, subpart OOOOa, as amended by the 2020 Policy Rule.

Petitions to reconsider. The EPA received three petitions for reconsideration of the 2020 rulemakings. Two of the petitions sought reconsideration of the 2020 Policy Rule. As discussed below, on June 30, 2021, the President signed into law S. J. Res. 14, a joint resolution under the CRA disapproving the 2020 Policy Rule, and as a result, the petitions for reconsideration on the 2020 Policy Rule are now moot. All three petitions sought reconsideration of certain elements of the 2020 Technical Rule.

Litigation. Several States and non-governmental organizations challenged the 2020 Policy Rule as well as the 2020 Technical Rule. All petitions for review regarding the 2020 Policy Rule were consolidated into one case in the D.C. Circuit. *State of California, et al. v. EPA*, No. 20-1357. On August 25, 2021, after the enactment of the joint resolution of Congress disapproving the 2020 Policy Rule (explained in section VIII below), the court granted petitioners motion to voluntarily dismiss their cases. *Id.* ECF Dkt #1911437. All petitions for review regarding the 2020 Technical Rule were consolidated into a different case in the D.C. Circuit. *Environmental Defense Fund, et al. v. EPA*, No. 20-1360 (D.C. Cir.). On February 19, 2021, the court issued an order granting a motion by the EPA to hold in abeyance the consolidated litigation over the 2020 Technical Rule pending EPA's rulemaking actions in response to EO 13990 and pending the conclusion of EPA's potential reconsideration of the 2020 Technical Rule. *Id.* ECF Dkt #1886335.

As mentioned above, the EPA received petitions for judicial review regarding the 2012, 2013, and 2014 NSPS OOOO rules as well as the 2016 NSPS OOOOa rule. The challenges to the 2012 NSPS OOOO rule (as amended by the 2013 NSPS OOOO and 2014 NSPS OOOO rules) were consolidated. *American Petroleum Institute v. EPA*, No. 13-1108 (D.C. Cir.). The majority of those cases were further consolidated with the consolidated challenges to the 2016 NSPS OOOOa rule. *West Virginia v. EPA*, No. 16-1264 (D.C. Cir.), see specifically ECF Dkt #1654072. As such, *West Virginia v. EPA* includes challenges to the 2012 NSPS OOOO rule (as amended by the 2013 NSPS OOOO and 2014 NSPS OOOO rules) as well as challenges to the 2016 NSPS OOOOa rule.[106] On December 10, 2020 the court granted a joint motion of the parties in *West Virginia v. EPA* to hold that case in abeyance until after the mandate has issued in the case regarding challenges to the 2020 Technical Rule. *West Virginia v. EPA*, ECF Dkt #1875192.

C. Congressional Review Act (CRA) Joint Resolution of Disapproval

On June 30, 2021, the President signed into law a joint resolution of Congress, S.J. Res. 14, adopted under the CRA,[107] disapproving the 2020 Policy Rule.[108] By the terms of the CRA, the signing into law of the CRA joint resolution of disapproval means that the 2020 Policy Rule is "treated as though [it] had never taken effect." 5 U.S.C. 801(f). As a result, the VOC and

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[106] When the EPA issued the 2016 NSPS OOOOa rule, a challenge to the 2012 NSPS OOOO rule for failing to regulate methane was severed and assigned to a separate case, *NRDC v. EPA*, No. 16-1425 (D.C. Cir.), pending judicial review of the 2016 NSPS OOOOa in *American Petroleum Institute v. EPA*, No. 13-1108 (D.C. Cir.)

[107] The Congressional Review Act was adopted in Subtitle E of the Small Business Regulatory Enforcement Fairness Act of 1996.

[108] *"Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review,"* 85 FR 57018 (Sept. 14, 2020) ("2020 Policy Rule")

methane standards for the transmission and storage segment, as well as the methane standards for the production and processing segments – all of which had been rescinded in the 2020 Policy Rule -- remain in effect. In addition, the EPA's authority and obligation to require the States to regulate existing sources of methane in the Crude Oil and Natural Gas source category under section 111(d) of the CAA also remains in effect.

The CRA resolution did not address the 2020 Technical Rule; therefore, those amendments remain in effect with respect to the VOC standards for the production and processing segments in effect at the time of its enactment. As part of this rulemaking, in sections VIII and X the EPA discusses the impact of the CRA resolution, and identifies and proposes appropriate changes to reinstate the regulatory text that had been rescinded by the 2020 Policy Rule and to resolve any discrepancies in the regulatory text between the 2016 NSPS OOOOa Rule and 2020 Technical Rule.

V. Related Emissions Reduction Efforts

This section summarizes related State actions and other Federal actions regulating oil and natural gas emissions sources and summarizes industry and voluntary efforts to reduce climate change. The proposed NSPS OOOOb and EG OOOOc include specific measures that build on the experience and knowledge the Agency and industry have gained through voluntary programs, as well as the leadership of the States in pioneering new regulatory programs. The proposed NSPS OOOOb and EG OOOOc consists of reasonable, proven, cost-effective technologies and practices that reflect the evolutionary nature of the Oil and Natural Gas Industry and proactive regulatory and voluntary efforts. The EPA intends that the requirements proposed in this notice

will spur all industry stakeholders in all parts of the country to apply these readily available and cost-effective measures.

A. Related State Actions and Other Federal Actions Regulating Oil and Natural Gas Sources

The EPA recognizes that several States and other Federal agencies currently regulate the Oil and Natural Gas Industry. The EPA also recognizes that these State and other Federal agency regulatory programs have matured since the EPA began implementing its 2012 NSPS and subsequent 2016 NSPS. The EPA further acknowledges the technical innovations that the Oil and Natural Gas Industry has made during the past decade; this industry is fast-paced and constantly changing based on the latest technology. The EPA commends these efforts and recognizes States for their innovative standards, alternative compliance options, and implementation strategies. The EPA recognizes that any one effort will not be enough to address the increasingly dangerous impacts of climate change on public health and welfare and believes that consistent Federal regulation of the Crude Oil and Natural Gas source category plays an important role. To have a meaningful impact on climate change and its impact to human health and the environment, a multifaceted approach needs to be taken to ensure methane reductions will be realized. The EPA also recognizes that States and other Federal agencies regulate in accordance with their own authorities and within their own respective jurisdictions, and collectively do not fully address the range of sources and emission reduction measures contained in this proposal. Direct Federal regulation of methane from new sources combined with the approved State plans that are consistent with the EPA's EG for existing sources will bring national consistency to level the regulatory playing field, help promote technological innovation, and reduce both climate- and other health-harming pollution from a large number of sources that

are either currently unregulated or where additional cost-effective reductions can be obtained. The EPA is committed to working within its authority to provide opportunities to align its programs with other existing State and Federal programs to reduce unnecessary regulatory redundancy where appropriate.

Among assessing various studies and emissions data, the EPA reviewed many current and proposed State regulatory programs to identify potential regulatory options that could be considered for BSER.[109] For example, the EPA reviewed California, Colorado, and Canadian regulations, as well as a pending proposed rule in New Mexico, that require non-emitting pneumatic devices at certain facilities and in certain circumstances. The EPA also examined California, Colorado, New Mexico (proposed), Pennsylvania, Wyoming, and the Bureau of Land Management (BLM) standards for liquids unloading events. Some of these States have led the way in regulating emissions sources that were not yet subject to requirements under the NSPS OOOOa. For example, Colorado requires the use of best management practices to minimize hydrocarbon emissions and the need for well venting associated with downhole well maintenance and liquids unloading, unless venting is necessary for safety. Other States, such as New Mexico, are evaluating similar requirements. Other States have requirements for emission sources currently regulated under NSPS OOOOa that are more stringent. For example, California and Colorado require continuous bleed natural gas-driven pneumatic controllers be non-emitting, with specified exceptions. We recognize that, in some cases, the EPA's proposed NSPS and/or EG may be more stringent than existing programs and, in other cases, may be less stringent than

[109] The NSPS OOOOb and EG TSD provides a high-level summary of the state programs that the agency assessed for purposes of this proposal.

existing programs. After careful review and consideration of State regulatory programs in place and proposed State regulations, we are proposing NSPS and EG that, when implemented, will reduce emissions of harmful air pollutants, promote gas capture and beneficial use, and provide opportunity for flexibility and expanded transparency in order to yield a consistent and accountable national program that provides a clear path for States and other Federal agencies to further partner to ensure their programs work in conjunction with each other.

As an example of how the EPA strives to work with sources in States that have overlapping regulations for the Oil and Natural Gas Industry, the 2020 Technical Rule included approval of certain State programs as alternatives to certain requirements in the Federal NSPS. Subject to certain caveats, the EPA deemed certain fugitive emissions standards for well sites and compressor stations located in specific States equivalent to the NSPS in an effort to reduce any regulatory burden imposed by duplicative State and Federal regulations. See 40 CFR 60.5399a. The EPA worked extensively with States and reviewed many details of many State programs in this effort. Further, the 2020 Technical Rule amended 40 CFR part 60 subpart OOOOa to incorporate a process that allows other States not already listed in 40 CFR 60.5399a to request approval of their fugitive monitoring program as an alternative to the NSPS. The EPA is proposing to include a similar request and approval process in NSPS OOOOb. Further, the EPA plans to work closely with States as they develop their State plans pursuant to the EG to look for opportunities to reduce unnecessary administrative burden imposed by redundant and duplicative regulatory requirements and help States that want to establish more stringent standards.

In addition to States, certain Federal agencies also regulate aspects of the oil and natural

gas industry pursuant to their own authorities and have other established programs affecting the industry. The EPA believes that Federal regulatory actions and efforts will provide other environmental co-benefits, but the EPA recognizes itself to be the Federal agency that has primary responsibility to protect human health and the environment and has been given the unique responsibility and authority by Congress to address the suite of harmful air pollutants associated with this source category. The EPA further believes that to have a meaningful impact to address the dangers of climate change, it is going to require an "all hands-on deck" effort across all States and all Federal agencies. The EPA has maintained an ongoing dialogue with its Federal partners during the development of this proposed rule to minimize any potential regulatory conflicts and to minimize confusion and regulatory burden on the part of owners and operators. The below description summarizes other agencies' regulations and other established Federal programs.

The U.S. Department of the Interior (DOI) regulates the extraction of oil and gas from Federal lands. Bureaus within the DOI include BLM and the Bureau of Ocean Energy Management (BOEM). The BLM manages the Federal government's onshore subsurface mineral estate – about 700 million acres (30 percent of the U.S.) – for the benefit of the American public. The BLM maintains an oil and gas leasing program pursuant to the Mineral Leasing Act, the Mineral Leasing Act for Acquired Lands, the Federal Land Management and Policy Act, and the Federal Oil and Gas Royalty Management Act. Pursuant to a delegation of Secretarial authority, the BLM also oversees oil and gas operations on many Indian/Tribal leases. The BLM's oil and gas operating regulations are found in 43 CFR Part 3160. An oil and gas operator's general environmental and safety obligations are found at 43 CFR 3162.5. The BLM does not directly

regulate emissions for the purposes of air quality. However, BLM does regulate venting and flaring of natural gas for the purposes of preventing waste. The governing Resource Management Plan may require lessees to follow State and the EPA emissions regulations. An operator may be required to control/mitigate emissions as a condition of approval (COA) on a drilling permit. The need for such a COA is determined by the environmental review process. The BLM's rules governing the venting and flaring of gas are contained in NTL-4A, which was issued in 1980. Under NTL-4A, limitations on royalty-free venting and flaring constitute the primary mechanism for addressing the surface waste of gas. In 2016, the BLM replaced NTL-4A with a new rule governing venting and flaring ("Waste Prevention Rule"). In addition to restricting royalty-free flaring, the rule set emissions standards for tanks and pneumatic equipment and established LDAR requirements. In 2020, a U.S. District Court of Wyoming largely vacated that rule, thereby reinstating NTL-4A. More detailed information can be found at the BLM's website: *https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/operations-and-production/methane-and-waste-prevention-rule.*

The BOEM manages the development of U.S. Outer Continental Shelf (offshore) energy and mineral resources. BOEM has air quality jurisdiction in the Gulf of Mexico[110] and the North Slope Borough of Alaska.[111] BOEM also has air jurisdiction in Federal waters on the Outer Continental Shelf 3-9 miles offshore (depending on State) and beyond. The Outer Continental Shelf Lands Act (OCSLA) section 5(a)(8) states, "The Secretary of the Interior is authorized to prescribe regulations 'for compliance with the national ambient air quality standards pursuant to

[110] The CAA gave BOEM air jurisdiction west of 87.5° longitude in the Gulf of Mexico region.
[111] The Consolidated Appropriations Act of 2012 gave BOEM air jurisdiction in the North Slope Borough of Alaska.

the CAA . . . to the extent that activities authorized under [the Outer Continental Shelf Lands Act] significantly affect the air quality of any State.'" The EPA and States have the air jurisdiction onshore and in State waters, and the EPA has air jurisdiction offshore in certain areas. More detailed information can be found at BOEM's website: *https://www.boem.gov/*.

The U.S. Department of Transportation (DOT) manages the U.S. transportation system. Within DOT, the Pipeline and Hazardous Materials Safety Administration (PHMSA) is responsible for regulating and ensuring the safe and secure transport of energy and other hazardous materials to industry and consumers by all modes of transportation, including pipelines. While PHMSA regulatory requirements for gas pipeline facilities have focused on human safety, which has attendant environmental co-benefits, the "*Protecting our Infrastructure of Pipelines and Enhancing Safety Act of 2020*" (Pub. L. 116-260, Division R; "PIPES Act of 2020"), which was signed into law on December 27, 2020, revised PHMSA organic statutes to emphasize the centrality of environmental safety and protection of the environment in PHMSA decision making. For example, the PHMSA's Office of Pipeline Safety ensures safety in the design, construction, operation, maintenance, and incident response of the U.S.' approximately 2.6 million miles of natural gas and hazardous liquid transportation pipelines. When pipelines are maintained, the likelihood of environmental releases like leaks are reduced.[112] In addition, the PIPES Act of 2020 contains several provisions that specifically address the minimization of releases of natural gas from pipeline facilities, such as a mandate that the Secretary of Transportation promulgate regulations related to gas pipeline LDAR programs. More detailed

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[112] See Final Report on Leak Detection Study to PHMSA. December 10, 2012. *https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/technical-resources/pipeline/16691/leak-detection-study.pdf.*

information can be found at PHMSA's website: *https://www.phmsa.dot.gov/.*

The U.S. Department of Energy (DOE) develops oil and natural gas policies and funds research on advanced fuels and monitoring and measurement technologies. Specifically, the Advanced Research Projects Agency-Energy (ARPA-E) program advances high-potential, high-impact energy technologies that are too early for private-sector investment. APRA-E awardees are unique because they are developing entirely new technologies. More detailed information can be found at ARPA-E's website: *https://arpa-e.energy.gov/.* Also, the U.S. Energy Information Administration (EIA) compiles data on energy consumption, prices, including natural gas, and coal. More detailed information can be found at the EIA's website: *https://www.eia.gov/.*

The U.S. Federal Energy Regulatory Commission (FERC) is an independent agency that regulates the interstate transmission of electricity, natural gas,[113] and oil.[114] FERC also reviews proposals to build liquefied natural gas terminals and interstate natural gas pipelines as well as licensing hydropower projects. The Commission's responsibilities for the crude oil industry include the following: Regulation of rates and practices of oil pipeline companies engaged in interstate transportation; establishment of equal service conditions to provide shippers with equal access to pipeline transportation; and establishment of reasonable rates for transporting petroleum and petroleum products by pipeline. The Commission's responsibilities for the natural gas industry include the following: regulation of pipeline, storage, and liquefied natural gas facility construction; regulation of natural gas transportation in interstate commerce; issuance of certificates of public convenience and necessity to prospective companies providing energy

[113] *https://www.ferc.gov/industries-data/natural-gas.*
[114] *https://www.ferc.gov/industries-data/oil.*

services or constructing and operating interstate pipelines and storage facilities; regulation of facility abandonment, establishment of rates for services; regulation of the transportation of natural gas as authorized by the Natural Gas Policy Act and OCSLA; and oversight of the construction and operation of pipeline facilities at U.S. points of entry for the import or export of natural gas. FERC has no jurisdiction over construction or maintenance of production wells, oil pipelines, refineries, or storage facilities. More detailed information can be found at FERC's website: *https://www.ferc.gov/*.

B. Industry and Voluntary Actions to Address Climate Change

Separate from regulatory requirements, some owners or operators of facilities in the Oil and Natural Gas Industry choose to participate in voluntary initiatives. Specifically, over 100 oil and natural gas companies participate in the EPA Natural Gas STAR and Methane Challenge partnership programs. Owners or operators also participate in a growing number of voluntary programs unaffiliated with the EPA voluntary programs. The EPA is aware of at least 19 such initiatives.[115] Firms might participate in voluntary environmental programs for a variety of reasons, including attracting customers, employees, and investors who value more environmental-responsible goods and services; finding approaches to improve efficiency and reduce costs; and preparing for or helping inform future regulations.[116,117]

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[115] Highwood Emissions Management (2021). "*Voluntary Emissions Reduction Initiatives for Responsibly Sourced Oil and Gas*." Available for download at: *https://highwoodemissions.com/research/*

[116] Borck, J. C. and C. Coglianese (2009). *"Voluntary Environmental Programs: Assessing Their Effectiveness."* Annual Review of Environment and Resources 34(1): 305-324.

[117] Brouhle, K., C. Griffiths, and A. Wolverton. (2009). *"Evaluating the role of EPA policy levers: An examination of a voluntary program and regulatory threat in the metal-finishing industry."* Journal of Environmental Economics and Management. 57(2): 166-181.

The EPA's Natural Gas STAR Program started in 1993 and seeks to achieve methane emission reductions through implementation of cost-effective best practices and technologies. Partner companies document their voluntary emission reduction activities and can report their accomplishments to the EPA annually. Natural Gas STAR includes over 90 partners across the natural gas value chain. Through 2019 partner companies report having eliminated nearly 1.7 trillion cubic feet of methane emissions since 1993.

The EPA's Methane Challenge Program was launched in 2016 and expands on the Natural Gas STAR Program with ambitious, quantifiable commitments and detailed, transparent reporting and partner recognition. Annually Methane Challenge partners submit facility-level reports that characterize the methane emission sources at their facilities and detail voluntary actions taken to reduce methane emissions. The EPA emphasizes the importance of transparency with the publication of these facility-level data. Although this program includes nearly 70 companies from all segments of the industry, most partners operate in the transmission and distribution segments.

Other voluntary programs for the oil and natural gas industry are administered by diverse organizations, including trade associations and non-profits. While the field of voluntary initiatives continues to grow, it is difficult to understand the present, and potential future, impact these initiatives will have on reducing methane emissions as the majority of these initiatives publish aggregated program-level data. The EPA recognizes the voluntary efforts of industry in reducing methane emissions beyond what is required by current regulations and in significantly expanding the understanding of methane mitigation measures. While progress has been made, there is still considerable remaining need to further reduce methane emissions from the Industry.

VI. Environmental Justice Considerations, Implications, and Stakeholder Outreach

To better inform this proposed rulemaking, the EPA assessed the characteristics of populations living near sources affected by the rule and conducted extensive outreach to overburdened and underserved communities and to environmental justice organizations. During our engagement with communities, concerns were raised regarding health effects of air pollutants, implications of climate change on lifestyle changes, water quality, or extreme heat events, and accessibility to data and information regarding sources near their homes. The EPA then considered this input along with other stakeholder input in designing the proposed rule. For example, one key issue identified through stakeholder input is the use of cutting-edge technologies for methane detection that can allow for rapid detection of high-emitting sources. As described below, the EPA is proposing to allow the use of such technologies in this rule, alongside a rigorous fugitive emissions monitoring program that is based on traditional OGI technology. Another key concern the Agency heard is addressing large emission sources faster, which, in addition to seeking more information on new detection technologies, the EPA is proposing to address with more frequent monitoring at sites with more emissions. The EPA also heard that adjacent communities are concerned about health impacts, and the EPA is proposing rigorous guidelines for pollution sources at existing facilities, methane standards for storage vessels, strengthened and expanded standards for pneumatic controllers, and standards for liquids unloading events that will further reduce emissions of those pollutants. These are just a few examples of how this proposed rule provides benefits to communities; section XII provides a full explanation and rationale of the proposed actions.

EO 12898 directs the EPA to identify the populations of concern who are most likely to

experience unequal burdens from environmental harms; specifically, minority populations, low-income populations, and indigenous peoples. 59 FR 7629 (February 16, 1994). Additionally, EO 13985 was signed in 2021 to advance racial equity and support underserved communities -- including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality-- through Federal government actions. 86 FR 7009 (January 20, 2021). With respect to climate change, EO 14008 titled "Tackling Climate Change at Home and Abroad" was signed on January 27, 2021, stating that climate considerations shall be an essential element of United States foreign policy and national security, working in partnership with foreign governments, States, territories, and local governments, and communities potentially impacted by climate change. The EPA defines environmental justice (EJ) as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The EPA further defines the term fair treatment to mean that "no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies" (*https://www.epa.gov/environmentaljustice*). In recognizing that minority and low-income populations often bear an unequal burden of environmental harms and risks, the EPA continues to consider ways of protecting them from adverse public health and environmental effects of air pollution emitted from sources within the Oil and Natural Gas Industry that are addressed in this proposed rulemaking.

A. Environmental Justice and the Impacts of Climate Change

In 2009, under the *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act* ("Endangerment Finding", 74 FR 66496), the Administrator considered how climate change threatens the health and welfare of the U.S. population.[118] As part of that consideration, she also considered risks to minority and low-income individuals and communities, finding that certain parts of the U.S. population may be especially vulnerable based on their characteristics or circumstances. These groups include economically and socially disadvantaged communities, including those that have been historically marginalized or overburdened; individuals at vulnerable lifestages, such as the elderly, the very young, and pregnant or nursing women; those already in poor health or with comorbidities; the disabled; those experiencing homelessness, mental illness, or substance abuse; and/or Indigenous or minority populations dependent on one or limited resources for subsistence due to factors including but not limited to geography, access, and mobility.

Scientific assessment reports produced over the past decade by the USGCRP,[119,120] the

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[118] Earlier studies and reports can be found at *https://www.epa.gov/cira/social-vulnerability-report*.

[119] USGCRP, 2018: *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018.

[120] USGCRP, 2016: *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. Crimmins, A., J. Balbus, J.L. Gamble, C.B. Beard, J.E. Bell, D. Dodgen, R.J. Eisen, N. Fann, M.D. Hawkins, S.C. Herring, L. Jantarasami, D.M. Mills, S. Saha, M.C. Sarofim, J. Trtanj, and L. Ziska, Eds. U.S. Global Change Research Program, Washington, DC, 312 pp. http://dx.doi.org/10.7930/J0R49NQX

(IPCC),[121,122,123,124], the National Academies of Science, Engineering, and Medicine[125,126], and the EPA[127] add more evidence that the impacts of climate change raise potential EJ concerns.

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[121] Oppenheimer, M., M. Campos, R.Warren, J. Birkmann, G. Luber, B. O'Neill, and K. Takahashi, 2014: *Emergent risks and key vulnerabilities*. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1039-1099.

[122] Porter, J.R., L. Xie, A.J. Challinor, K. Cochrane, S.M. Howden, M.M. Iqbal, D.B. Lobell, and M.I. Travasso, 2014: *Food security and food production systems. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 485-533.

[123]Smith, K.R., A.Woodward, D. Campbell-Lendrum, D.D. Chadee, Y. Honda, Q. Liu, J.M. Olwoch, B. Revich, and R. Sauerborn, 2014: Human health: impacts, adaptation, and co-benefits. In: Climate Change 2014: *Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel,A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 709-754.

[124] IPCC, 2018: Global Warming of 1.5°C.An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press.

[125] National Research Council. 2011. *America's Climate Choices*. Washington, DC: The National Academies Press. https://doi.org/10.17226/12781.

[126] National Academies of Sciences, Engineering, and Medicine. 2017. *Communities in Action: Pathways to Health Equity*. Washington, DC: The National Academies Press. https://doi.org/10.17226/24624.

[127] EPA. 2021. Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts. U.S. Environmental Protection Agency, EPA 430-R-21-003.

These reports conclude that less-affluent, traditionally marginalized and predominantly non-White communities can be especially vulnerable to climate change impacts because they tend to have limited resources for adaptation, are more dependent on climate-sensitive resources such as local water and food supplies, or have less access to social and information resources. Some communities of color, specifically populations defined jointly by ethnic/racial characteristics and geographic location (*e.g.,* African-American, Black, and Hispanic/Latino communities; Native Americans, particularly those living on Tribal lands and Alaska Natives), may be uniquely vulnerable to climate change health impacts in the U.S., as discussed below. In particular, the 2016 scientific assessment on the *Impacts of Climate Change on Human Health*[128] found with high confidence that vulnerabilities are place- and time-specific, lifestages and ages are linked to immediate and future health impacts, and social determinants of health are linked to greater extent and severity of climate change-related health impacts.

Per the NCA4, "Climate change affects human health by altering exposures to heat waves, floods, droughts, and other extreme events; vector-, food- and waterborne infectious diseases; changes in the quality and safety of air, food, and water; and stresses to mental health and well-being."[129] Many health conditions such as cardiopulmonary or respiratory illness and other health impacts are associated with and exacerbated by an increase in GHGs and climate

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[128] USGCRP, 2016: *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*

[129] Ebi, K.L., J.M. Balbus, G. Luber, A. Bole, A. Crimmins, G. Glass, S. Saha, M.M. Shimamoto, J. Trtanj, and J.L. White-Newsome, 2018: Human Health. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 539–571. doi: 10.7930/NCA4.2018.CH14

change outcomes, which is problematic as these diseases occur at higher rates within vulnerable communities. Importantly, negative public health outcomes include those that are physical in nature, as well as mental, emotional, social, and economic.

The scientific assessment literature, including the aforementioned reports, demonstrates that there are myriad ways in which these populations may be affected at the individual and community levels. Outdoor workers, such as construction or utility workers and agricultural laborers, who are frequently part of already at-risk groups, are exposed to poor air quality and extreme temperatures without relief. Furthermore, individuals within EJ populations of concern face greater housing and clean water insecurity and bear disproportionate economic impacts and health burdens associated with climate change effects. They also have less or limited access to healthcare and affordable, adequate health or homeowner insurance. The urban heat island effect can add additional stress to vulnerable populations in densely populated cities who do not have access to air conditioning.[130] Finally, resiliency and adaptation are more difficult for economically disadvantaged communities: They tend to have less liquidity, individually and collectively, to move or to make the types of infrastructure or policy changes necessary to limit or reduce the hazards they face. They frequently face systemic, institutional challenges that limit their power to advocate for and receive resources that would otherwise aid in resiliency and hazard reduction and mitigation.

The assessment literature cited in the EPA's 2009 Endangerment Finding, as well as *Impacts of Climate Change on Human Health,* also concluded that certain populations and people in particular stages of life, including children, are most vulnerable to climate-related

[130] USGCRP, 2016

health effects. The assessment literature produced from 2016 to the present strengthens these conclusions by providing more detailed findings regarding related vulnerabilities and the projected impacts youth may experience. These assessments – including the NCA4 (2018) and *The Impacts of Climate Change on Human Health in the United States* (2016) – describe how children's unique physiological and developmental factors contribute to making them particularly vulnerable to climate change. Impacts to children are expected from air pollution, infectious and waterborne illnesses, and mental health effects resulting from extreme weather events. In addition, children are among those especially susceptible to allergens, as well as health effects associated with heat waves, storms, and floods. Additional health concerns may arise in low-income households, especially those with children, if climate change reduces food availability and increases prices, leading to food insecurity within households. More generally, these reports note that extreme weather and flooding can cause or exacerbate poor health outcomes by affecting mental health because of stress; contributing to or worsening existing conditions, again due to stress or also as a consequence of exposures to water and air pollutants; or by impacting hospital and emergency services operations.[131] Further, in urban areas in particular, flooding can have significant economic consequences due to effects on infrastructure, pollutant exposures, and drowning dangers. The ability to withstand and recover from flooding is dependent in part on the social vulnerability of the affected population and

[131] Ebi, K.L., J.M. Balbus, G. Luber, A. Bole, A. Crimmins, G. Glass, S. Saha, M.M. Shimamoto, J. Trtanj, and J.L. White-Newsome, 2018: Human Health. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 539–571. doi: 10.7930/NCA4.2018.CH14

individuals experiencing an event.[132]

The Impacts of Climate Change on Human Health (USGCRP, 2016) also found that some communities of color, low-income groups, people with limited English proficiency, and certain immigrant groups (especially those who are undocumented) live with many of the factors that contribute to their vulnerability to the health impacts of climate change. While difficult to isolate from related socioeconomic factors, race appears to be an important factor in vulnerability to climate-related stress, with elevated risks for mortality from high temperatures reported for Black or African-American individuals compared to White individuals after controlling for factors such as air conditioning use. Moreover, people of color are disproportionately exposed to air pollution based on where they live, and disproportionately vulnerable due to higher baseline prevalence of underlying diseases such as asthma, so climate exacerbations of air pollution are expected to have disproportionate effects on these communities. Locations with greater health threats include urban areas (due to, among other factors, the "heat island" effect where built infrastructure and lack of green spaces increases local temperatures), areas where airborne allergens and other air pollutants already occur at higher levels, and communities experienced depleted water supplies or vulnerable energy and transportation infrastructure.

The recent EPA report on climate change and social vulnerability[133] examined four socially vulnerable groups (individuals who are low income, minority, without high school diplomas, and/or 65 years and older) and their exposure to several different climate impacts (air

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[132] National Academies of Sciences, Engineering, and Medicine 2019. Framing the Challenge of Urban Flooding in the United States. Washington, DC: The National Academies Press. https://doi.org/10.17226/25381.

[133] EPA. 2021. Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts. U.S. Environmental Protection Agency, EPA 430-R-21-003.

quality, coastal flooding, extreme temperatures, and inland flooding). This report found that Black and African-American individuals were 40% more likely to currently live in areas with the highest projected increases in mortality rates due to climate-driven changes in extreme temperatures, and 34% more likely to live in areas with the highest projected increases in childhood asthma diagnoses due to climate-driven changes in particulate air pollution. The report found that Hispanic and Latino individuals are 43% more likely to live in areas with the highest projected labor hour losses in weather-exposed industries due to climate-driven warming, and 50% more likely to live in coastal areas with the highest projected increases in traffic delays due to increases in high-tide flooding. The report found that American Indian and Alaska Native individuals are 48% more likely to live in areas where the highest percentage of land is projected to be inundated due to sea level rise, and 37% more likely to live in areas with high projected labor hour losses. Asian individuals were found to be 23% more likely to live in coastal areas with projected increases in traffic delays from high-tide flooding. Those with low income or no high school diploma are about 25% more likely to live in areas with high projected losses of labor hours, and 15% more likely to live in areas with the highest projected increases in asthma due to climate-driven increases in particulate air pollution, and in areas with high projected inundation due to sea level rise.

Impacts of Climate Change on Indigenous Communities. Indigenous communities face disproportionate risks from the impacts of climate change, particularly those communities impacted by degradation of natural and cultural resources within established reservation boundaries and threats to traditional subsistence lifestyles. Indigenous communities whose health, economic well-being, and cultural traditions depend upon the natural environment will

likely be affected by the degradation of ecosystem goods and services associated with climate change. The IPCC indicates that losses of customs and historical knowledge may cause communities to be less resilient or adaptable.[134] The NCA4 (2018) noted that while indigenous peoples are diverse and will be impacted by the climate changes universal to all Americans, there are several ways in which climate change uniquely threatens indigenous peoples' livelihoods and economies.[135] In addition, there can be institutional barriers (including policy-based limitations and restrictions) to their management of water, land, and other natural resources that could impede adaptive measures.

For example, indigenous agriculture in the Southwest is already being adversely affected by changing patterns of flooding, drought, dust storms, and rising temperatures leading to increased soil erosion, irrigation water demand, and decreased crop quality and herd sizes. The Confederated Tribes of the Umatilla Indian Reservation in the Northwest have identified climate risks to salmon, elk, deer, roots, and huckleberry habitat. Housing and sanitary water supply infrastructure are vulnerable to disruption from extreme precipitation events. Confounding general Native American response to natural hazards are limitations imposed by policies such as the Dawes Act of 1887 and the Indian Reorganization Act of 1934, which ultimately restrict Indigenous peoples' autonomy regarding land-management decisions through Federal trusteeship of certain Tribal lands and mandated Federal oversight of management decisions. Additionally,

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[134] Porter et al., 2014: Food security and food production systems.
[135] Jantarasami, L.C., R. Novak, R. Delgado, E. Marino, S. McNeeley, C. Narducci, J. Raymond-Yakoubian, L. Singletary, and K. Powys Whyte, 2018: Tribes and Indigenous Peoples. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 572–603. doi: 10.7930/NCA4. 2018. CH15

NCA4 noted that Indigenous peoples are subjected to institutional racism effects, such as poor infrastructure, diminished access to quality healthcare, and greater risk of exposure to pollutants. Consequently, Native Americans often have disproportionately higher rates of asthma, cardiovascular disease, Alzheimer's disease, diabetes, and obesity. These health conditions and related effects (e.g., disorientation, heightened exposure to $PM_{2.5}$, etc.) can all contribute to increased vulnerability to climate-driven extreme heat and air pollution events, which also may be exacerbated by stressful situations, such as extreme weather events, wildfires, and other circumstances.

NCA4 and IPCC's Fifth Assessment Report[136] also highlighted several impacts specific to Alaskan Indigenous Peoples. Coastal erosion and permafrost thaw will lead to more coastal erosion, rendering winter travel riskier and exacerbating damage to buildings, roads, and other infrastructure –impacts on archaeological sites, structures, and objects that will lead to a loss of cultural heritage for Alaska's indigenous people. In terms of food security, the NCA4 discussed reductions in suitable ice conditions for hunting, warmer temperatures impairing the use of traditional ice cellars for food storage, and declining shellfish populations due to warming and acidification. While the NCA4 also noted that climate change provided more opportunity to hunt from boats later in the fall season or earlier in the spring, the assessment found that the net impact was an overall decrease in food security.

B. Impacted Stakeholders

Based on analyses of exposed populations, the EPA has determined that this action, if finalized in a manner similar to what is proposed in this document, is likely to help reduce

[136] Porter et al., 2014: Food security and food production systems.

adverse effects of air pollution on minority populations, and/or low-income populations that have the potential for disproportionate impacts, as specified in EO 12898 (59 FR 7629, February 16, 1994) and referenced in EO 13985 (86 FR 7009, January 20, 2021). The EPA remains committed to engaging with communities and stakeholders throughout the development of this rulemaking and continues to invite comments on how the Agency can better achieve these goals through this action. For this proposed rule, we assessed emissions of HAP, criteria pollutants, and pollutants that cause climate change.

For HAP emissions, we estimated cancer risks and the demographic breakdown of people living in areas with potentially elevated risk levels by performing dispersion modeling of the most recent NEI data from 2017, which indicates nationwide emissions of approximately 110,000 tpy of over 40 HAP (including benzene, toluene, ethylbenzene, xylenes, and formaldehyde) from the Oil and Natural Gas Industry. Table 12 gives the risk and demographic results for the Oil and Natural Gas Industry from this screening-level assessment. We estimate there are 39,000 people with cancer risk greater than or equal to 100-in-1 million attributable to oil and natural gas sources, with a maximum estimated risk of 200-in-1 million occurring in three census blocks (10 people). We estimate there are about 143,000 people with estimated risk greater than or equal to 50-in-1 million, and about 6.8 million people with estimated cancer risk greater than 1-in-1 million. It is important to note that these estimates are subject to various types of uncertainty related to input parameters and assumptions, including emissions datasets, exposure modeling and the dose-response relationships.[137]

As shown in Table 12, Hispanic and Latino populations and young people (ages 0-17) are

[137] See 'Risk Report Template' at Docket ID No. EPA-HQ-OAR-2021-0317.

disproportionately represented in communities exposed to elevated cancer risks from oil and natural gas sources, while the proportion of people in other demographic groups with estimated risks above the specified levels is at or below the national average. The overall percent minority is about the same as the national average, but the percentage of people exposed to cancer risks greater than or equal to the 100-in-1 million and 50-in-1 million thresholds who are Hispanic or Latino is about 10 percentage points higher than the national average. The overall minority percentage is not elevated compared to the national average because the African-American percentage is much lower than the national average. The demographic group of people aged 0-17 is slightly higher than the national average.

TABLE 12. CANCER RISK AND DEMOGRAPHIC POPULATION ESTIMATES FOR 2017 NEI NONPOINT OIL AND NATURAL GAS EMISSIONS

	Risks ≥ 100-in-1 million		Risks ≥ 50-in-1 million		Risks > 1-in-1 million		
Total Population	39,000		143,000		6,805,000		Nationwide
	Population	%	Population	%	Population	%	%
Minority	13,268	34.1	52,154	36.5	2,010,161	29.5	39.9
African American	140	0.4	1,434	1.0	535,055	7.9	12.2
Native American	77	0.2	465	0.3	59,087	0.9	0.7
Other and Multiracial	1,443	3.7	5,148	3.6	323,397	4.8	8.2
Hispanic or Latino	11,608	29.9	45,107	31.6	1,092,621	16.1	18.8
Age 0-17	10,679	27.5	37,487	26.2	1,463,907	21.5	22.6
Age ≥ 65	4,272	11.0	17,188	12.0	1,085,067	15.9	15.7
Below the Poverty Level	2,000	5.1	13,455	9.4	902,472	13.2	13.4
Over 25 Without a	2,788	7.2	11,320	7.9	488,372	7.2	12.1

High School Diploma							
Linguistically Isolated	808	2.1	4,418	3.1	179,739	2.6	5.4

For criteria pollutants, we assessed exposures to ozone from Oil and Natural Gas Industry VOC emissions across races/ethnicities, ages, and sexes in a recent baseline (pre-control) air quality scenario. Annual air quality was simulated using a photochemical model for the year 2017, based on emissions from the most recent NEI. The analysis shows that the distribution of exposures for all demographic groups except Hispanic and Asian populations are similar to or below the national average or a reference population. Differences between exposures in Hispanic and Asian populations versus White or all populations are modest, and the results are subject to various types of uncertainty related to input parameters and assumptions.

In addition to climate and air quality impacts, the EPA also conducted analyses to characterize potential impacts on domestic oil and natural gas production and prices and to describe the baseline distribution of employment and energy burdens. Section XVI.d describes the results for our analysis of prices and production. For the distribution of baseline employment, we assessed the demographic characteristics of 1) workers in the oil and gas sector and 2) people living in oil and natural gas intensive communities.[138] Comparing workers in the oil and natural gas sector to workers in other sectors, oil and natural gas workers may have higher than average incomes, be more likely to have completed high school, and be disproportionately Hispanic. People in some oil and gas intensive communities concentrated in Texas, Oklahoma, and

[138] For this analysis, oil and natural gas intensive communities are defined as the top 20% of communities with respect to the proportion of oil and natural gas workers.

Louisiana have lower average income levels, lower rates of high school completion, and higher likelihood of being non-Whites or hispanic than people living in communities that are not oil and gas intensive. Regarding household energy burden, low-income households, Hispanic, and Black households' energy expenditures may comprise a disproportionate share of their total expenditures and income as compared to higher income, non-Hispanic, and non-Black households, respectively. Results are presented in detail in the RIA accompanying this proposal.

In a proximity analysis of Tribes living within 50 miles of affected sources, we found 112 unique Tribal lands (Federally recognized Reservations, Off-Reservation Trust Lands, and Census Oklahoma Tribal Statistical Areas (OTSA)) located within 50 miles of a source with 32 Tribes having one or more sources located on Tribal land.

Finally, the EPA has also analyzed prior enforcement actions related to air pollution from storage vessels, and identified improvements in air quality resulting from these actions as particularly important in communities with EJ concerns (identified using EJSCREEN).[139] In a 2021 analysis of resolved enforcement matters, the EPA determined that communities with EJ concerns experience a disproportionate level of air pollution burden from storage vessel emissions. Although only about 25 percent of storage vessels were located in these communities with EJ concerns, 67 percent of the total emission reductions of VOCs, methane, PM, and NOx (about 95 million pounds) achieved through these enforcement resolutions occurred in communities with EJ concerns. This analysis suggests that the provisions of this proposed rule requiring installation of controls at storage vessels and monitoring and mitigation of fugitive

[139] See Memorandum "Analysis of Environmental Justice Impacts of EPA's Historical Oil and Gas Storage Vessel Enforcement Resolutions (40 CFR Part 60 subpart OOOO and OOOOa)," located at Docket ID No. EPA-HQ-OAR-2021-0317.

emissions and malfunctions at storage vessels, would have particular benefits for these communities.

C. Outreach and Engagement

The EPA identified stakeholder groups likely to be interested in this action and engaged with them in several ways including through meetings, training webinars, and public listening sessions to share information with stakeholders about this action, on how stakeholders may comment on the proposed rule, and to hear their input about the industry and its impacts as we were developing this proposal. Specifically, on May 27, 2021, the EPA held a webinar-based training designed for communities affected by this rule.[140] This training provided an overview of the Crude Oil and Natural Gas Industry and how it is regulated and offered information on how to participate in the rulemaking process. The EPA also held virtual public listening sessions June 15 through June 17, 2021, and heard various community and health related themes from speakers who participated.[141,142] Community themes included concerns about protecting communities adjacent to oil and gas activities, providing monitoring and data so communities know what is in the air they are breathing, and upholding Tribal trust responsibilities. Community speakers urged the EPA to adopt stringent measures to reduce oil and natural gas pollution, and frequently cited an analysis suggesting such measures could achieve reductions of 65 percent below 2012 levels

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[140] *https://www.epa.gov/sites/default/files/2021-05/documents/us_epa_training_webinar_on_oil_and_natural_gas_for_communities.5.27.2021.pdf*

[141] June 15, 2021 session: *https://youtu.be/T8XwDbf-B8g; June 16, 2021* session: *https://www.youtube.com/watch?v=l23bKPF-5oc*; June 17, 2021 session: *https://www.youtube.com/watch?v=R2AZrmfuAXQ*

[142] Full transcripts for the listening sessions are posted at EPA Docket ID No. EPA-HQ-OAR-2021-0295.

by 2025.

Community Access to Emissions Information. Several stakeholders requested that the rule include requirements that provide communities with information, including fence line monitoring or "better monitoring so people will know the air they are breathing." A few speakers expressed concerned about the correct placement of existing air monitors. Speakers from Texas described local air monitors monitoring meteorology and ozone, but not hazardous air pollutants, and called on the EPA to consider alternative monitoring for oil and natural gas sources such as fence-line monitors, along with guidance from the EPA to require monitors of oil and natural gas facilities in close proximity to parks, schools, and playgrounds.

Health Concerns in Adjacent Communities. Speakers raised concerns about impacts on frontline communities and those communities adjacent to oil and natural gas operations. These stakeholders called on the EPA to propose and promulgate stricter standards or alternative requirements for sources adjacent to urban communities and close to where people live and work. Several speakers used the term "energy sacrifice zone" when discussing the disproportionate impacts of oil and natural gas operations on frontline communities. Speakers advocated that when developing this regulatory effort, consultation with frontline communities is essential, and some speakers cited a Center for Investigative Reporting report stating that 30,000 children in Arlington, Texas, attend school within half a mile of active oil and gas sites. Speakers discussed concerns about methane as a formaldehyde precursor and related health effects and cited examples of health effects including hydraulic fracturing chemicals being measured in blood or urine; increases in nosebleeds in people in areas of oil and natural gas development; headaches and cancer. These speakers included teenagers from Pennsylvania, who said they live

within 1 mile of 33 wellheads and 500 feet of a pipeline. Several people cited a February 2018 blowout and explosion in Belmont County, Ohio, that was reported to release 60,000 tons of methane in 20 days and said that is more than some countries emit in a year. Speakers also expressed related environmental concerns such as water contamination and fresh drinking water being diverted for hydraulic fracturing. One speaker urged that information on local water use be provided in languages other than English, stating that in Big Spring (Howard County), Texas, the local government only provided information to use tap water "at your own risk" in English.

Additional concerns raised by communities included: local compressor stations having numerous planned and unplanned releases into adjacent communities, which appear to be during startup; whether the EPA will use a robust cost analysis to address the economic impacts of labor loss and gas costs resulting from any regulation; if plugged and abandoned wells included in this action, will this regulation apply to BLM land; will States be required to use the same emissions calculation used by the EPA for methane GWP; will there be disclosure of necessary data collection or technology to be used by the Oil and Natural Gas Industry to track and reduce methane emissions; and will the EPA consider the necessity of venting and flaring from a safety standpoint. Communities also discussed concerns about excess emissions from storage vessels and the need for clarifying the applicability of the standard in addition to improving enforceability and compliance at this type of facility.

In addition to the trainings and listening sessions, the EPA engaged with community leaders potentially impacted by this proposed action by hosting a meeting with EJ community leaders on May 14, 2021. As noted above, the EPA provided the public with factual information to help them understand the issues addressed by this action. We obtained input from the public,

including communities, about their concerns about air pollution from the oil and gas industry, including receiving stakeholder perspectives on alternatives. The EPA considered and weighed information from communities as the agency developed this proposed action.

In addition to the engagement conducted prior to this proposal, the EPA is providing the public, including those communities disproportionately impacted by the burdens of pollution, opportunities to engage in the EPA's public comment period for this proposal, including by hosting public hearings. This public hearing will occur according to the schedule identified in the **DATES** and **SUPPLEMENTARY INFORMATION** section of this preamble to discuss:

- What impacts they are experiencing (i.e., health, noise, smells, economic),
- How the community would like the EPA to address their concerns,
- How the EPA is addressing those concerns in the rulemaking, and
- Any other topics, issues, concerns, etc. that the public may have regarding this proposal.

For more information about the EPA's pre-proposal outreach activities, please see EPA Docket ID No. EPA-HQ-OAR-2021-0295. Please refer to EPA Docket ID No. EPA-HQ-OAR-2021-0317 for submitting public comments on this proposed rulemaking. For public input to be considered during the formal rulemaking, please submit comments on this proposed action to the formal regulatory docket at EPA Docket ID No. EPA-HQ-OAR-2021-0317 so that the EPA may consider those comments during the development of the final rule.

D. Environmental Justice Considerations

The EPA considered EJ implications in the development of this proposed rulemaking process, including the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income. As part of this process, the EPA engaged and consulted with

frontline communities through interactions such as webinars, listening sessions and meetings. These opportunities gave the EPA a chance to hear directly from the public, especially overburdened and underserved communities, on the development of the proposed rule. The EPA considered these community concerns throughout our internal development process that resulted in this proposal which, if finalized in a manner similar to what is being proposed, will reduce emissions of harmful air pollutants, promote gas capture and beneficial use, and provide opportunity for flexibility and expanded transparency in order to yield a consistent and accountable national program. The EPA's proposed NSPS and EG are summarized in sections XI and XII below. Anticipated impacts of this action are discussed further in section XVI of this preamble.

In recognizing that minority and low-income populations often bear an unequal burden of environmental harms and risks, the EPA continues to consider ways to protect them from adverse public health and environmental effects of air pollution emitted from sources within the Oil and Natural Gas Industry that are addressed in this proposed rulemaking. For these reasons, in section XIV.C the EPA is proposing to include an additional requirement associated with the adoption and submittal of State plans pursuant to EG OOOOc (in addition to the current requirements of Subpart Ba) by requiring States to meaningfully engage with members of the public, including overburdened and underserved communities, during the plan development process and prior to adoption and submission of the plan to the EPA. The EPA is proposing this specific meaningful engagement requirement to ensure that the State plan development process is inclusive, effective, and accessible to all.

Details of the EPA's assessment of EJ considerations can be found in the RIA for this

action. The EPA seeks input on the EJ analyses contained in the RIA, as well as broader input on other health and environmental risks the Agency should assess in the comprehensive development of this proposed action. In particular, the EPA is soliciting comment on key assumptions underlying the EJ analysis as well as data and information that would enable the Agency to conduct a more nuanced analysis of HAP and criteria pollutant exposure and risk, given the inherent uncertainty regarding risk assessment. More broadly, the EPA seeks information, analysis, and comment on how the provisions of this proposed action would affect air pollution and health in communities with environmental justice concerns, and whether there are further provisions that EPA should consider as part of a supplemental proposal or a final rule that would enhance the health and environmental benefits of this rule for these communities.

VII. Other Stakeholder Outreach

A. Educating the Public, Listening Sessions, and Stakeholder Outreach

The EPA began the development of this proposed action to reduce methane and other harmful pollutants from new and existing sources in the Crude Oil and Natural Gas source category with a public outreach effort to gather a broad range of stakeholder input. This effort included: Opening a public docket for pre-proposal input;[143] holding training sessions providing overviews of the industry, the EPA's rulemaking process and how to participate in it; and convening listening sessions for the public, including a wide range of stakeholders. The EPA additionally held roundtables with State environmental commissioners through the Environmental Council of the States, and oil and gas commissioners and staff through the

[143] EPA Docket ID No. EPA-HQ-OAR-2021-0295

Interstate Oil and Gas Compact Commission (IOGCC), and met with non-governmental organizations (NGOs), industry, and the U.S. Climate Alliance, among others.[144]

In addition to the trainings and listening sessions noted in section VI above, on May 25 and 26, 2021, the EPA held webinar-based trainings designed for small business stakeholders[145] and Tribal nations.[146] The training provided an overview of the Oil and Natural Gas Industry and how it is regulated and offered information on how to participate in the rulemaking process. A combined total of more than 100 small business stakeholders and Tribal nations participated. During the training, small business stakeholders expressed interest in learning more about the EPA's plan to either modify the 2016 NSPS OOOOa or take more substantial action in this proposal. For Tribal nations, the EPA has assessed potential impacts on Tribal nations and populations and has engaged with Tribal stakeholders to hear concerns associated with air pollution emitted from sources within the Oil and Natural Gas Industry that are addressed in this proposed rulemaking. Tribal members mentioned the need for the EPA to uphold its trust responsibilities, propose and promulgate rules that protect disproportionately impacted communities, and asked that the EPA allocate resources for Tribal governments to implement regulations through Tribal air quality programs.

As noted above, the EPA also heard from a broad range of stakeholders during

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[144] A full list of pre-proposal meetings the EPA participated in is included at EPA Docket ID No. EPA-HQ-OAR-2021-0317.

[145] *https://www.epa.gov/sites/default/files/2021-05/documents/oil_and_gas_training_webinar_small_businesses_05.25.21.pdf*

[146] *https://www.epa.gov/sites/default/files/2021-05/documents/usepa_training_webinar_on_oil_and_natural_gas_for_tribes.5.26.2021.pdf*

virtual public listening sessions held from June 15 through June 17, 2021,[147] which featured a total of 173 speakers.[148] Many speakers stressed the urgent need to address climate change and the importance of reducing methane pollution as part of the nation's overall response to climate change. In addition to the community perspectives described above, the Agency also heard from industry speakers who were generally supportive of the regulation and stressed the need to provide compliance flexibility and allow industry the ability to use cutting-edge tools, including measurement tools, to implement requirements. Technical comments from other speakers also focused on a need for robust methane monitoring and fugitive emissions monitoring, a need to strengthen standards for flares as a control for associated gas, and suggestions to improve compliance. The sections below provide additional details on the information presented by stakeholders during these listening sessions.

1. Technical Themes

Measurement and Monitoring. Stakeholders advocated that the EPA modernize the rule by employing next-generation tools for methane identification and quantification, particularly for large emission or "super-emissions" events. Stakeholders particularly focused on allowing the use of remote sensing to help industry more easily comply with monitoring requirements at well pads, which are numerous and geographically spread out in some States. Stakeholders specified the desire to use innovative remote sensing technologies to monitor fugitive emissions and large emission events, including aerial, truck-based, satellite, and continuous monitoring. Several

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[147] June 15, 2021 session: *https://youtu.be/T8XwDbf-B8g*; June 16, 2021 session: *https://www.youtube.com/watch?v=l23bKPF-5oc*; June 17, 2021 session: *https://www.youtube.com/watch?v=R2AZrmfuAXQ*

[148] Full transcripts for the listening sessions are posted in at EPA Docket ID No. EPA-HQ-OAR-2021-0295.

speakers focused on the need for regular monitoring, repair, and reporting, including ambient air monitoring in oil and natural gas development areas, as well as suggesting that the EPA pursue more robust methane monitoring for fugitive emissions, ensure that repair is completed, and pursue robust monitoring and reporting to verify the efficacy of the regulations.

Implementation, Compliance, and Enforcement. Numerous stakeholders raised concerns about flaring of associated gas and advocated for more stringent standards to ensure that flares used as control devices perform effectively. One speaker, an OGI expert, noted seeing many flares that were not operating the way they were intended to and that were not adequately designed (*e.g.,* unlit flares and ignition gas not being close enough to the waste gas stream to properly ignite). The speaker suggested that the EPA consider the concept of 'thermal tuning' of flares by using OGI to see if a plume of unburned hydrocarbons extends downwind from the flare, to ensure that flares are actually operating effectively; the speaker suggested that this use of OGI could be done in conjunction with fugitive emissions monitoring to make sure controls are working. Stakeholders further emphasized the need for recordkeeping of any inspections that are made (*e.g.,* looking for flare damage from burned tips, lightning strikes). Some stakeholders also requested that the EPA consider reducing or eliminating flaring of associated gas and incentivizing capture. Lastly, one speaker raised concerns about flaring of associated gas in Texas and how flaring is permitted by the State. In response to these concerns, the EPA is proposing to reduce venting and flaring of associated gas and to require monitoring of flares to detect malfunctions. Further, the EPA is soliciting comment on whether to adopt additional measures to assure proper design and operation of control devices, including flares, as discussed in section XIII.

Stakeholders raised other implementation, compliance, and enforcement concerns, including calls for the EPA to develop rules that are easy to apply and implement given States' limited budgets. Stakeholders cautioned that "flexibility" in a rule can be interpreted as a "loophole," and opined that a rule that sets clear and uniform expectations will help avoid confusion. At the same time, speakers stated that a "prescriptive checklist" does not work in today's environment and recommended that the EPA modernize the regulatory approach. Several speakers, including speakers from Texas and North Dakota, raised concerns about the limited enforcement capacity of local and State governments, as well as the EPA and its regional officials and stated that this may result in implementation gaps. Speakers called on the EPA to have a third-party verification or audit requirements for fugitive emissions and cited to Texas's requirement for third-party audits to evaluate operator LDAR programs for highly reactive VOC. Speakers also cited to the public-facing Environmental Defense Fund (EDF) methane map[149] with geotags of sources with observed hydrocarbon emissions, which provides operators an opportunity to respond to posted leak videos and measurements. Lastly, one speaker requested that the EPA not allow exemptions for start-up and shutdown emissions events. The EPA is soliciting comment on ways to utilize credible emissions information obtained from communities and others, as discussed in section XI.A.1.

Wells and Storage. Some stakeholders requested that the EPA consider a program for capping abandoned wells to ensure those wells are properly closed and not leaking. Speakers called on the EPA to consider abandoned and unplugged wells in the context of EJ communities adjacent to affected facilities and requested that the EPA incentivize appropriate well closure. In

[149] *https://www.permianmap.org*

response to this input and to gather information that will be needed to inform possible future actions, the EPA is soliciting comment on ways to address abandoned wells, including potential closure requirements. See section XIII.B. Stakeholders also focused on marginal wells and asked that the EPA consider system-wide reductions be allowed, for example, at the basin level, and expressed challenges of retrofitting existing well sites and low production well sites where addition of control devices or closed vent systems would be necessary. Some speakers raised concern about ensuring that facilities are engineered for the basin or target formation from which they produce.

Job Creation. Some speakers stated that this rulemaking is a job creation rule and encouraged a "next generation" approach to methane standards, such as incentivizing continuous monitoring. Other speakers cited a study about job creation in the methane mitigation industry.[150]

Inventory, Loss Rates, and Methane Global Warming Potential. Several speakers criticized the EPA's emission inventories stating that the EPA is not using the correct data in its inventory, that the GHGI data is inaccurate because it relies on facility reporting of emissions from calculations and estimation methods rather than measurement and monitoring, and suggested that the EPA rely on monitoring and measurement of actual emissions and subsequently make the monitoring data publicly available. Speakers raised issues with differences in inventories across Federal agencies, contrasting DOE's Environmental Impact Statements and EPA's NEI. Stakeholders suggested that the EPA use data collected by EDF and

[150] Stakeholders submitted the following studies to the pre-proposal docket: *https://www.regulations.gov/comment/EPA-HQ-OAR-2021-0295-0016* and *https://www.regulations.gov/comment/EPA-HQ-OAR-2021-0295-0017*.

other researchers, which calculated methane emissions to be 60 percent higher than the EPA's estimates.[151] Speakers also mentioned the amount of methane that is lost from wells each year, providing varying estimates of these emissions. Lastly, stakeholders called on the EPA to use the 20-year GWP for methane, instead of the 100-year value the agency uses.

2. Climate and Other Themes

Several speakers mentioned the effects of climate change from oil and natural gas methane emissions, such as impacts on farmland, wildfires, and transmission of tick-borne pathogens. Many speakers pointed out the extreme heat and drought that currently are affecting the western U.S. Stakeholders asked that the EPA examine the impacts of the Oil and Natural Gas Industry on small businesses that are not part of the regulated community, such as businesses that rely on outdoor recreation or water flow that could be affected by oil and natural gas operations. A speaker raised concerns about the impact of the industry on tourism, saying that 30 percent of their local economy relies on tourism and outdoor recreation. Lastly, a speaker discussed pipeline weatherization needs and suggested that the EPA and other Federal agencies account for seasonal variability.

In addition to the public listening sessions, on June 29, 2021, the EPA met with environmental commissioners and staff through the Environmental Council of the States (ECOS). Subsequently, on July 12, 2021, the EPA participated in a roundtable with members of the IOGCC. The discussions in both roundtables included air emissions monitoring technologies and interactions between the EPA's requirements and State rules. For the ECOS roundtable, the

[151] Alvarez et al. 2018. *Assessment of methane emissions from the U.S. oil and gas supply chain*. Science 13 Jul 2018: Vol. 361, Issue 6398, pp. 186-188.

EPA also sought feedback on and implementation of the EPA's current NSPS; for the IOGCC roundtable, the EPA also requested feedback on compliance with the rules.

Key themes from both roundtables included the following: Allowing for the use of broad types of methane detection technologies; improving and streamlining the EPA's AMEL process, such as by structuring it so it could apply broadly rather than on a site-by-site basis; requests that expanded aspects of States' rules be deemed equivalent to the EPA's rule, and requests that the EPA's rule complement State regulations in a way that would not interrupt the work of State agencies requiring them to request State legislative approvals. Other common themes were requests that the rule provide flexibility and be easy to implement, particularly for marginal or low production wells owned by independent small businesses, and that the EPA coordinate its rules with those of other Federal agencies, notably the DOI's BLM.

Other input included the need to fill gaps by addressing additional opportunities to reduce emissions beyond the 2016 NSPS OOOOa, concerns about the complexity of the calculation for the potential to emit for storage vessels, a desire that the EPA's rule not slow momentum of voluntary efforts to reduce emissions, and a desire for regulations that recognize geographic differences.

B. EPA Methane Detection Technology Workshop

The EPA held a virtual public workshop on August 23 and 24, 2021, to hear perspectives on innovative technologies that could be used to detect methane emissions from the Oil and Natural Gas Industry.[152] The workshop focused on methane-sensing technologies that are not

[152] *https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry/epa-methane-detection-technology-workshop.*

currently approved for use in the NSPS for the Oil and Natural Gas Industry, and how those technologies could be applied in the Crude Oil and Natural Gas sector. Panelists provided twenty-four live presentations during the workshop. The panelists all had firsthand experience evaluating innovative methane-sensing technologies or had used these technologies to identify methane emissions and presented about their experience. The live presentations were broken into six panel sessions, each focused on a particular topic, *e.g.,* satellite measurements, methane sensors, aerial technologies. At the end of each panel session, the set of panelists participated in a question-and-answer session. In addition to the live presentations, the workshop included a virtual exhibit hall for technology vendors to provide video presentations on their innovative technologies, with a focus on technology capability, applicability, and data quality. Forty-two vendors participated in the virtual vendor hall.

Nine hundred sixty stakeholders registered to participate in the workshop. The workshop was also livestreamed, so stakeholders who could not attend could watch the recorded livestream later at their convenience. The registrants included a wide range of stakeholders including, academics, methane detection technology end-user and vendors, governmental employees (local, State, and Federal), and NGOs.

C. How is this information being considered in this proposal?

The EPA's pre-proposal outreach effort was intended to gather stakeholder input to assist the Agency with developing this proposal.[153] The EPA recognizes that tackling the dangers of climate change will require an "all-hands-on deck" approach through regulatory, voluntary, and

[153] The EPA opened a non-regulatory docket for stakeholder to submit early input. That early input can be found at EPA Docket I.D. Number EPA-HQ-OAR-2021-0295.

community programs and initiatives. Throughout the development of this proposed rule, the EPA considered the stakeholders' experiences and lessons learned to help inform how to better structure this proposal and consider ongoing challenges that will require continued collaboration with stakeholders. The EPA will continue to consider the information obtained in developing this proposal as we take the next steps on the proposed regulations.

With this proposal, the EPA seeks further input from the public and from all stakeholders affected by this rule. Throughout this action, unless noted otherwise, the EPA is requesting comments on all aspects of this proposal, including on several themes raised in the pre-proposal outreach (*e.g.*, innovative technologies for methane detection and quantification). Please see section XI.A.1 of this preamble for specific solicitations for comment regarding advanced measurement technologies and section XIII for solicitations for comments on additional emission sources. For public input to be considered on this proposal,[154] please submit comments on this proposed action to the regulatory docket at EPA Docket ID No. EPA-HQ-OAR-2021-0317 so that the EPA may consider those comments during the development of the final rule.

VIII. Legal Basis for Proposal Scope

The EPA proposes in this rulemaking to revise certain NSPS and to promulgate additional NSPS for both methane and VOC emissions from new oil and gas sources in the production, processing, transmission and storage segments of the industry; and to promulgate EG to require States to regulate methane emissions from existing sources in those segments. The

[154] Information submitted to the pre-proposal non-regulatory docket at Docket ID No. EPA-HQ-OAR-2021-0295 is not automatically part of the proposal record. For information and materials to be considered in the proposed rulemaking record, it must be resubmitted in the rulemaking docket at EPA Docket ID No. EPA-HQ-OAR-2021-0317.

large amount of methane emissions from the Oil and Natural Gas Industry – by far, the largest methane-emitting industry in the nation – coupled with the adverse effects of methane on the global climate compel immediate regulatory action. This section explains EPA's legal justification for proceeding with this proposed action, including regulating methane and VOCs from sources in all segments of the source category. The EPA first describes the history of our regulatory actions for oil and gas sources in 2016 and 2020 – including the key legal interpretations and factual determinations made– as well as Congress's action in 2021 in response. The EPA then explains the implications of Congress's action and why we would come to the same conclusion even if Congress had not acted.

Today's proposal is in line with our 2016 NSPS OOOOa Rule, which likewise regulated methane and VOCs from all three segments of the industry. The 2016 NSPS OOOOa Rule explained that these three segments should be regulated as part of the same source category because they are an interrelated sequence of functions in which pollution is produced from the same types of sources that can be controlled by the same techniques and technologies. That Rule further explained that the large amount of methane emissions, coupled with the adverse effects of GHG air pollution, met the applicable statutory standard for regulating methane emissions from new sources through NSPS. Furthermore, the Rule explained, this regulation of methane emissions from new sources triggered the EPA's authority and obligation to set guidelines for States to develop standards to regulate the overwhelming majority of oil and gas sources, which the CAA categorizes as "existing" sources. In the 2020 Policy Rule, the Agency reversed course, concluding based upon new legal interpretations that the rule concluded the EPA had not made the proper determinations necessary to issue such regulations. This action eliminated the

Agency's authority and obligation to issue EG for existing sources. In 2021, Congress adopted a joint resolution to disapprove the EPA's 2020 Policy rule under the CRA. According to the terms of CRA, the 2020 Policy Rule is "treated as though [it] had never taken effect," 5 U.S.C. 801(f), and as a result, the 2016 rule is reinstated.

In disapproving the 2020 Policy Rule under the CRA, Congress explicitly rejected the 2020 Policy Rule interpretations and embraced EPA's rationales for the 2016 NSPS OOOOa Rule. The House Committee on Energy & Commerce emphasized in its report that the source category "is the largest industrial emitter of methane in the U.S.," and directed that "regulation of emissions from new and existing oil and gas sources, including those located in the production, processing, and transmission and storage segments, is necessary to protect human health and welfare, including through combatting climate change, and to promote environmental justice." H.R. Rep. No. 117-64, 3-5 (2021) (House Report). A statement from the Senate cosponsors likewise underscored that "methane is a leading contributing cause of climate change," whose "emissions come from all segments of the Oil and Gas Industry," and stated that "we encourage EPA to strengthen the standards we reinstate and aggressively regulate methane and other pollution emissions from new, modified, and existing sources throughout the production, processing, transmission and storage segments of the Oil and Gas Industry under section 111 of the CAA." 167 Cong. Rec. S2282 (April 28, 2021) (statement by Sen. Heinrich) (Senate Statement).[155] The Senators concluded with a stark statement: "The welfare of our planet and of our communities depends on it." *Id.* at S2283.

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[155] Sen. Heinrich stated that he made this statement on behalf of "[Majority [l]eader Chuck Schumer, Chairman Tom Carper of the Committee on Environment and Public Works, Senator

Today's proposal comports with the EPA's CAA section 111 obligation to reduce dangerous pollution and responds to the urgency expressed by the current Congress. With this proposal, the EPA is taking additional steps in the regulation of the Crude Oil and Natural Gas source category to protect human health and the environment. Specifically, the agency is proposing to revise certain of those NSPS, to add NSPS for additional sources, and to propose EG that, if finalized, would impose a requirement on States to regulate methane emissions from existing sources. As the EPA explained in the 2016 rule, this source category collectively emits massive quantities of the methane emissions that are among those driving the grave and growing threat of climate change, particularly in the near term. 81 FR 35834, June 3, 2016. As discussed in section III above, since that time, the science has repeatedly confirmed that climate change is already causing dire health, environmental, and economic impacts in communities across the United States.

Because the 2021 CRA resolution automatically reinstated the 2016 rule, which itself determined that the Crude Oil and Natural Gas Source Category included the transmission and storage segment and that regulation of methane emissions was justified, the EPA is authorized to take the regulatory actions proposed in this rule. As explained below, we are reaffirming those determinations as clearly authorized under any reasonable interpretation of section 111. Because the reinstatement of the 2016 rule provides the only necessary predicate for this rule, and

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Angus King, Senator Edward Markey and [himself]," who he described as "leading supporters and sponsors of S.J. Res. 14…." Senate Statement at S. 2282. Thus, the Senate Statement should be considered an authoritative piece of the legislative history. It should be noted that the Joint Resolution was referred to the Senate Committee on Environment and Public Works and discharged from the committee by petition pursuant to 5 U.S.C. 802(c), *https://www.congress.gov/bill/117th-congress/senate-joint-resolution/14/all-actions.* As a result, the resolution was not accompanied by a report from the Senate committee.

because, as described, the interpretations underlying this rule are sound, the EPA is not reopening them here.

A. Recent History of the EPA's Regulation of Oil and Gas Sources and Congress's Response.

1. 2016 NSPS OOOOa Rule

As described above, the 2016 NSPS OOOOa Rule extended the NSPS for VOCs for new sources in the Crude Oil and Natural Gas source category and also promulgated NSPS for methane emissions from new sources. This rule contained several interpretations that were the bases for these actions, and that are important for present purposes. First, the EPA confirmed its position in the 2012 NSPS OOOO Rule that the scope of the oil and gas source category included the transmission and storage segment, in addition to the production and processing segments that the EPA had regulated since 1984. The agency stated that it believed these segments were included in the initial listing of the source category, and to the extent they were not, the agency determined to add them as appropriately encompassed within the regulated source category. The EPA based this latter conclusion on the structure of the industry. In particular, the EPA emphasized that "[o]perations at production, processing, transmission, and storage facilities are a sequence of functions that are interrelated and necessary for getting the recovered gas ready for distribution," and further explained, "[b]ecause they are interrelated, segments that follow others are faced with increases in throughput caused by growth in throughput of the segments preceding (*i.e.,* feeding) them." 81 FR 35832, June 3, 2016. The EPA also recognized "that some equipment (*e.g.,* storage vessels, pneumatic pumps and compressors) are used across the oil and natural gas industry." *Id.* Having made clear that the Crude Oil and

Natural Gas source category includes the transmission and storage segment, the EPA proceeded to promulgate NSPS for sources in that segment. *Id.* at 35826.

Second, in promulgating NSPS for methane emissions for new sources in the source category, the EPA explained its decision to regulate GHGs for the first time from the source category. Noting that the plain language of CAA section 111 requires a significant-contribution analysis only when EPA regulates a new source category, not a new pollutant, the Agency stated that it "interprets CAA section 111(b)(1)(B) to provide authority to establish a standard for performance for any pollutant emitted by that source category as long as the EPA has a rational basis for setting a standard for the pollutant." 81 FR 35842 June 3, 2016. In the alternative, if a rational-basis analysis were deemed insufficient, the EPA explained that it also concluded that GHG emissions, in the form of methane emissions, from the regulated Crude Oil and Natural Gas source category significantly contribute to dangerous pollution. *Id.* at 81 FR 35843, and 35877. In making the rational basis and alternative significant contribution findings, the EPA focused on "the high quantities of methane emissions from the Crude Oil and Natural Gas source category." *Id.* The EPA emphasized, among other things, that "[t]he Oil and Natural Gas source category is the largest emitter of methane in the U.S., contributing about 29 percent of total U.S. methane emissions." *Id.* The EPA added that "[t]he methane that this source category emits accounts for 3 percent of all U.S. GHG emissions… [and] GWP-weighted emissions of methane from these sources are larger than emissions of all GHGs from about 150 countries." *Id.* The EPA concluded that "the[se] facts … along with prior EPA analysis" concerning the effect of GHG air pollution on public health and welfare, "including that found in the 2009 Endangerment Finding, provide a rational basis for regulating GHG emissions from affected oil and gas

sources…" as well as for concluding in the alternative that oil and gas methane significantly contributes to dangerous pollution. *Id.* at 35843.

In addition, in the 2016 NSPS OOOOa Rule, EPA recognized that promulgation of NSPS for methane emissions under section 111(b)(1)(B) triggered the requirement that EPA promulgate EG to require States to regulate methane emissions from existing sources under section 111(d)(1), and described the steps it was taking to lay the groundwork for that regulation. 81 FR at 35831.

2. 2020 Policy Rule

The 2020 Policy Rule rescinded key elements of the 2016 NSPS OOOOa Rule based on different factual assertions and statutory interpretations than in the 2016 rule. Specifically, the 2020 Policy Rule stated that it "contains two main actions," 85 FR 57019, September 14, 2020 which it identified as follows: "First, the EPA is finalizing a determination that the source category includes only the production and processing segments of the industry and is rescinding the standards applicable to the transmission and storage segment of the industry…." *Id.* The rule justified this first action in part on the grounds that "the processes and operations found in the transmission and storage segment are distinct from those found in the production and processing segments," because "the purposes of the operations are different" and because "the natural gas that enters the transmission and storage segment has different composition and characteristics than the natural gas that enters the production and processing segments." *Id.* at 57028. "Second, the EPA is separately rescinding the methane requirements of the NSPS applicable to sources in the production and processing segments." *Id.* EPA justified the rescission of the methane NSPS on two grounds. One was the EPA's "conclu[sion] that those methane requirements are

redundant with the existing NSPS for VOC and, thus, establish no additional health protections." *Id.* at 57019. The second was a statutory interpretation: the EPA rejected the rational basis interpretation of the 2016 rule, and stated that instead, "[t]he EPA interprets [the relevant provisions in CAA section 111] … to require, or at least to authorize the Administrator to require, a pollutant-specific SCF as a predicate for promulgating a standard of performance for that air pollutant." Id. at 57035. The rule went on to "determine that the SCF for methane that the EPA made in the alternative in the 2016 [NSPS OOOOa] Rule was invalid and did not meet this statutory standard," for two reasons: (i) "[t]he EPA made that finding on the basis of methane emissions from the production, processing, and transmission and storage segments, instead of just the production and processing segments"; and (ii) "the EPA failed to support that finding with either established criteria or some type of reasonably explained and intelligible standard or threshold for determining when an air pollutant contributes significantly to dangerous air pollution." *Id.* at 57019. The rule recognized that "by rescinding the applicability of the NSPS … to methane emissions for [oil and gas] sources … existing sources … will not be subject to regulation under CAA section 111(d)." *Id.* at 57040.

3. CRA Resolution Disapproving the 2020 Policy Rule and Reinstating the 2016 NSPS OOOOa Rule.

On June 30, 2021, the President signed into law a joint resolution adopted by Congress under the CRA disapproving the 2020 Policy Rule. By the terms of the CRA, this disapproval means that the 2020 Policy Rule is "treated as though [it] had never taken effect." 5 U.S.C. 801(f). As a result, upon the disapproval, by operation of law, the 2016 NSPS OOOOa Rule was reinstated, including the inclusion of the transmission and storage segment in the source

category, the VOC NSPS for sources in that segment, and the methane NSPS for sources across the source category. And with the reinstatement of the methane NSPS, the EPA's obligation to issue EG to require States to regulate existing sources for methane emissions was reinstated as well. Moreover, the CRA bars an agency from promulgating "a new rule that is substantially the same as" a disapproved rule. 5 U.S.C. 801(b)(2).

The accompanying legislative history, specifically a House Committee report (H.R. Rep. 117-64) and a statement on the Senate floor by the sponsors of the CRA resolution (Senate Statement at S2282-83), provides additional specificity regarding Congress's intent in disapproving 2020 Policy Rule and reinstating the 2016 rule with regard to the scope of the source category and the regulation of methane.

a. Regulation of Transmission and Storage Sources

The House Report rejected the 2020 Policy Rule's removal of the transmission and storage segment from the Crude Oil and Natural Gas Source Category, and its rescission of the VOC and methane NSPS promulgated in the 2012 NSPS OOOO and 2016 NSPS OOOOa Rules for transmission and storage sources. House Report at 7; 85 FR 57029, September 14, 2020 (2020 Policy Rule). The Report recognized that in authorizing the EPA to list for regulation "categories of sources" under section 111(b)(1)(A) of the CAA, Congress "provided the EPA with wide latitude to determine the scope of a source category … and to expand the scope of an already-listed source category if the agency later determines that it is reasonable to do so." House Report at 7. The Report stated that in the 2016 NSPS OOOOa, "EPA correctly determined that the equipment and operations at production, processing, and transmission and storage facilities are a sequence of functions that are interrelated and necessary for the overall purpose of

extracting, processing, and transporting natural gas for distribution." *Id.;* see 81 FR 35832, June 3, 2016 (2016 Rule). The Report added that the 2016 NSPS OOOOa also "correctly determined that the types of equipment used and the emissions profile of the natural gas in the transmission and storage segments do not so distinctly differ from the types of equipment used and the emissions profile of the natural gas in the production and processing segments as to require that the EPA create a separate source category listing." House Report at 7; see 81 FR 35832, June 3, 2016. The Report went on to reject the 2020 Policy Rule's basis for excluding the transmission and storage segment, finding that the functions of the various segments in the Crude Oil and Natural Gas sector are all "interrelated and necessary for the overall purpose" of the industry, House Report at 7, and that EPA correctly determined in 2016 that the source types and emissions found in the transmission and storage segment are sufficiently similar to production and processing as to justify regulating these segments in a single source category. *Id.*

The Senate Statement was also explicit that the 2020 Policy Rule erred in rescinding NSPS for sources in the transmission and storage segment:

> [T]he resolution clarifies our intent that EPA should regulate methane and other pollution emissions from all oil and gas sources, including production, processing, transmission, and storage segments under the authority of section 111 of the CAA. In addition, we intend that section 111 … obligates and provides EPA with the legal authority to regulate existing sources of methane emissions in all of these segments.

Senate Statement at S2283 (paragraphing revised).

b. Regulation of Methane—Redundancy

The House Report and Senate Statement made clear Congress's view that in light of the large amount of methane emissions from oil and gas sources and their impact on global climate, the EPA must regulate those emissions under section 111. House Report at 5; Senate Statement at S2283. Both pieces of legislative history specifically rejected the 2020 Policy Rule's rescission of the methane NSPS. House Report at 7; Senate Statement at S2283. Moreover, the legislative history specifically rejected the statutory interpretations of section 111 that formed the bases of EPA's 2020 rationales for rescinding the methane NSPS. House Report at 7-10; see Senate Statement at S2283; see 85 FR 57033, 57035-38 (September 14, 2020).

The House Report began by recognizing the critical importance of regulating methane emissions from oil and gas sources, emphasizing both the potency of methane in driving global warming, and the massive amounts of methane emitted each year by the oil and gas industry. House Report at 3-4. The House Report was clear that the amount of these emissions and their impact compelled regulatory action. *Id.* at 5. The Senate Statement was equally clear:

> [M]ethane is a leading contributing cause of climate change. It is 28 to 36 times more powerful than carbon dioxide in raising the Earth's surface temperature when measured over a 100–year time scale and about 84 times more powerful when measured over a 20–year timeframe.
>
> Industrial sources emit GHG in great quantities, and methane emissions from all segments of the Oil and Gas Industry are especially significant in their contribution to overall emissions levels and surface temperature rise….
>
> In fact, with the congressional adoption of this resolution, we encourage EPA to strengthen the standards we reinstate and aggressively regulate methane

> and other pollution emissions from new, modified, and existing sources throughout the production, processing, transmission, and storage segments of the Oil and Gas Industry under section 111 of the Clean Air Act.
>
> The welfare of our planet and of our communities depend on it.

Senate Statement at S2283.

Turning to the 2020 Policy Rule, the House Report rejected the rule's position that the methane NSPS were redundant to the VOC NSPS, and therefore unnecessary. House Report at 7. The House Report rejected the 2020 Policy Rule's "redundancy" rationale, explaining that in the 2016 NSPS OOOOa, the EPA had consciously "formulated [the two sets of NSPS so as] to impose the same requirements for the same types of equipment," and that the co-extensive nature of the NSPS mean that "sources could comply with them in an efficient manner," not that the NSPS were redundant. *Id.* The House report further rejected the 2020 Policy Rule's assertion that it need not take into account the implications of regulating methane for existing sources, calling it a "fundamental misinterpretation of section 111, and the critical importance of section 111(d) in Congress [*sic*: Congress's] scheme." House Report at 8 & n. 27 (The EPA's 2020 "misinterpretation … was glaring and enormously consequential" because it precluded regulation of methane from existing sources). The House Report emphasized that "existing sources emit the vast majority of methane in the oil and gas sector," *id.* and pointed out that while the 2016 NSPS "covered roughly 60,000 wells constructed since 2015[, t]here are more than 800,000 existing wells in operation…."*Id.* n.28.

The Senate Statement also made clear that the resolution of disapproval "reaffirms that the CAA requires EPA to act to protect Americans from sources of … methane," "reject[s] the

[2020 Policy Rule's] misguided legal interpretations," and "clarifies our intent that EPA should regulate methane … from all oil and gas sources…." Senate Statement at 2283.

c. Regulation of Methane—Significant Contribution Finding

The legislative history was explicit that, contrary to the EPA's statutory interpretation in the 2020 Policy Rule, section 111 of the CAA, by its plain language, does not require, or authorize the EPA to require, as a prerequisite for promulgating NSPS for a particular air pollutant from a listed source category, a separate finding by the EPA that emissions of the pollutant from the source category contribute significantly to dangerous air pollution. House Report at 9-10; Senate Statement at S2283. The House Report rejected this interpretation. It made clear that instead, consistent with the EPA's statements in the 2016 NSPS OOOOa and the plain language of the CAA, section 111 requires that the agency must make a SCF only at "the first step of the process, the listing of the source category," and further requires that this finding "must apply to the impact of the 'category of sources' on 'air pollution'" as opposed to individual pollutants. House Report at 9. The House Report went on to explain that this provision "does not require the EPA to make a SCF for individual air pollutants emitted from the source category, nor does it even mention individual air pollutants," *id.* at 9. The House Report went on to explain in some detail the meaning that the EPA should give to section 111, which, consistent with the 2016 rule, is that section 111 authorizes the agency to promulgate NSPS for particular pollutants as long as it has a rational basis for doing so. House Report at 8-9. The report explained that after the EPA lists a source category for regulation under section 111(b)(1)(A), it is required to determine for which pollutants to promulgate NSPS, and this determination is subject to CAA section 307(d)(9)(A) ("In the case of review of any [EPA] action … to which

[section 307(d)] applies, the court may reverse any such action found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law").[156] The Report further noted that the U.S. Supreme Court affirmed this interpretation in *American Electric Power Co. Inc. v. Connecticut*, 564 U.S. 410, 427 (2011) (*American Electric Power*) ("EPA may not decline to regulate carbon-dioxide emissions from powerplants if refusal to act would be 'arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law" (citing section 307(d)(9)(A)). The Report went on to note that the 2016 NSPS OOOOa had stated that the EPA was authorized to promulgate a NSPS for a particular pollutant if it had a "rational basis" for doing so, and the Report emphasized that this "rational basis" standard is "fully consistent with" the arbitrary and capricious standard under section 307(d)(9)(A) of the CAA. House Report at 9.[157]

The House Report further explained that, in contrast, the 2020 Policy Rule's statutory interpretation of section 111 to require a pollutant-specific SCF as a predicate for promulgating NSPS was foreclosed by "the plain language of" section 111 – noting that this interpretation ignored the distinction between the text of section 111 and that of other CAA provisions which do explicitly require a pollutant-specific cause-or-contribution finding. *Id.* at 10. Moreover, the Report added, "[g]iven that the statute is not ambiguous, the EPA cannot interpret section 111 to authorize the EPA to exercise discretion to require … a pollutant-specific SCF as a predicate for promulgating a [NSPS] for the pollutant." *Id.* at 10. The Report went on to note several other supports for its statutory interpretation, including the legislative history of section 111. *Id.* at 10-

[156] Section 307(d) applies to the promulgation of NSPS, under section 307(d)(1)(C).
[157] The House Report dismissed the 2020 Policy Rule's criticism of the rational basis test as unduly vague by noting that a court could enforce it. House Report at 11.

11.

The Senate Statement took the same approach, stating: "we do not intend that section 111 of [the] CAA requires EPA to make a pollutant-specific significant contribution finding before regulating emissions of a new pollutant from a listed source category…." Senate Statement at S2283.[158]

The House Report also expressly disapproved of the 2020 Policy Rule's interpretation of section 111 to require that the SCF must be based on some "identif[ied] standard or established set of criteria," and not the facts-and-circumstances approach that EPA has used in making that finding for the source category. House Report at 10-11; *see* 2020 Policy Rule at 57038. The Report stated, "[i]t is fully appropriate for EPA to exercise its discretion to employ a facts-and-circumstances approach, particularly in light of the wide range of source categories and the air pollutants they emit that EPA must regulate under section 111." House Report at 11.

Finally, in reinstating the methane regulations, the legislative history for the CRA resolution clearly expressed the intent that the EPA proceed with regulation of existing sources. The House Report was explicit in this regard, stating that "[p]assage of the resolution of disapproval indicates Congress' support and desire to immediately reinstate … EPA's statutory obligation to regulate existing oil and natural gas sources under [CAA] section 111(d)." House Report at 3; see *id*. at 11-12. The report added that upon enactment of the resolution of

[158] Both the House Report and the Senate Statement recognized that EPA could, if it chose to, make a finding that a particular pollutant contributes significantly to dangerous air pollution, in order, for example, to inform the public about the risks of a pollutant. House Report at 10, Senate Statement at S2283. However, the House Report made clear that "it is the rational basis determination as to the risk a pollutant poses to endangerment of human health or welfare [and not any such SCF] that remains the statutory basis for the EPA's action." House Report at 10.

disapproval, "the Committee strongly encourages the EPA to take swift action to … fulfill its statutory obligation to issue existing source guidelines under [CAA] section 111(d)." *Id.* The Senate Statement was substantially similar. Senate Statement at S2283 ("By adopting this resolution of disapproval, it is our view that Congress reaffirms that the CAA requires EPA to act to protect Americans from sources of climate pollution like methane, which endangers the public's health and welfare…. [W]e intend that [CAA] section 111 … obligates and provides EPA with the legal authority to regulate existing sources of methane emissions in [the Crude Oil and Natural Gas source category].").

B. Effect of Congress's Disapproval of the 2020 Policy Rule

Under the CRA, the disapproved 2020 Policy Rule is "treated as though [it] had never taken effect." 5 U.S.C. 801(f). As a result, the preceding regulation, the 2016 NSPS OOOOa Rule, was automatically reinstated, and treated as though it had never been revised by the 2020 Policy Rule. Moreover, the CRA bars EPA from promulgating "a new rule that is substantially the same as" a disapproved rule. 5 U.S.C. 801(b)(2), for example, a rule that deregulates methane emissions from the production and processing sectors or deregulates the transmission and storage sector entirely.

The legislative history of the CRA gives further content to Congress's disapproval and the bar on substantially similar rulemaking. The legislative history rejected the EPA's statutory interpretations of section 111 in the 2020 Policy Rule and endorsed the legal interpretations contained in the 2016 NSPS OOOOa Rule. Specifically, Congress expressed its intent that the transmission and storage segment be included in the source category, that sources in that

segment remain subject to NSPS, and that all oil and gas sources be subject to NSPS for methane emissions.[159]

The EPA is now proceeding to propose additional requirements to reduce emissions from oil and gas sources, consistent with the statutory factors the EPA is required to consider under section 111 and with section 111's overarching purpose of protecting against pollution that endangers health and welfare. While the reinstatement of the 2016 Rule through the CRA joint resolution of disapproval provides the predicate for this action, the EPA notes that, for the reasons discussed next, the EPA would reject the positions concerning legal interpretations taken in the 2020 Policy Rule and reaffirm the positions the Agency took in the 2016 rule even absent the CRA resolution. The EPA provides this information for the purposes of informing the public and is not re-opening these positions for comment.

C. Affirming the Legal Interpretations in the 2016 NSPS OOOOa Rule

The Agency has reviewed all of the information and analyses in the 2016 NSPS OOOOa and 2020 Policy Rule, and fully reaffirms the positions it took in the 2016 rule and rejects the positions taken in the 2020 Policy Rule.[160] For this rulemaking, the EPA has reviewed its prior actions, along with newly available information, including recent information concerning the

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[159] See generally "*Federal-State Unemployment Compensation Program; Establishing Appropriate Occupations for Drug Testing of Unemployment Compensation Applicants Under the Middle-Class Tax Relief and Job Creation Act of 2012: Final Rule*," 84 FR 53037, 53083 (Oct. 4, 2019) (citing legislative history of CRA resolution disapproving prior rule in explaining scope of new rule).

[160] Under *F.C.C. v. Fox Television Stations, Inc.,* 556 U.S. 502 (2009), an agency may revise its policy, but must demonstrate that the new policy is permissible under the statute and is supported by good reasons, taking into account the record of the previous rule. To the extent that this standard applies in this action—where Congress has disapproved the 2020 Policy Rule—the EPA believes the explanations provided here satisfy the standard.

dangers posed by climate change and the impact of methane emissions, as described in section III above. Based on this review, the EPA affirms the statutory interpretations underlying the 2016 rule and rejects the different interpretations informing the congressionally voided 2020 Policy Rule. This section explains the EPA's views. These views are confirmed by Congress's reasoning in the legislative history of the CRA resolution and so, for convenience, this section occasionally refers to that legislative history.

In particular, the EPA reaffirms that the Crude Oil and Natural Gas Source Category appropriately includes the transmission and storage segment, along with the production and processing segments. The EPA has broad discretion in determining the scope of the source category, and the 2016 Rule correctly identified the most important aspect of the industry, which is the interrelatedness of the segments and their common purpose in completing the multi-step process to prepare natural gas for marketing. 81 FR 35832, September 14, 2020. The 2020 Policy Rule's objection that the chemical composition of natural gas changes as it moves from the production and processing segments to the transmission and storage segment, 85 FR 57028, September 14, 2020, misses the mark because in every segment methane predominates and the refining of natural gas in the processing segment, which is what changes its chemical composition, is appropriately viewed simply as one of the steps in the marketing of the gas. Further, while it is true that some of the equipment in each segment differs from the equipment in the other segments, as the 2020 Policy Rule pointed out, 85 FR 57029 (September 14, 2020), that too simply results from the fact that the segments represent different steps in the process of preparing natural gas for marketing. The more salient fact is that most of the polluting equipment, such as storage vessels, pneumatic pumps, and compressors, are found throughout

the segments and emit the same pollutants that can be controlled by the same techniques and technologies, 81 FR 35832 (September 14, 2020), underscoring the interrelated functionality of the segments and the appropriateness of regulating them together as part of a single source category. The scope of the source category as defined in 2016, and proposed to be affirmed in this rule, is well within the reasonable bounds of the EPA's past practice in defining source categories, which sometimes even contain sources that are located in multiple distinct industries. *See* 40 CFR Subpart Db (industrial-commercial-institutional steam generating units), 40 CFR Subpart IIII (stationary compression ignition internal combustion engines). In this regard, the House Report correctly noted that "even the presence of large distinctions in equipment type and emissions profile across two segments would not necessarily preclude EPA from regulating those segments as a single source category, so long as the EPA could identify some meaningful relationship between them," House Report at 7, as the EPA did in the 2016 rule. Thus, the 2020 Policy Rule failed to articulate appropriate reasons to change the scope of the source category from what the EPA determined in the 2016 rule. Having properly identified the scope of the source category as including the transmission and storage segment in the 2016 rule, the EPA lawfully promulgated NSPS for sources in that segment.

The EPA also affirms that the 2016 rule established an appropriate basis for promulgating methane NSPS from oil and gas sources, and that the 2020 Policy Rule erred on all grounds in rescinding the methane NSPS. The importance of taking action at this time, in accordance with the requirements of CAA section 111, to reduce the enormous amount of methane emissions from oil and gas sources, in light of the impacts on the climate of this pollution, cannot be overstated. As stated in section I, the Oil and Natural Gas Industry is the largest industrial emitter

of methane in the U.S. Human emissions of methane, a potent GHG, are responsible for about one third of the warming due to well-mixed GHGs, the second most important human warming agent after carbon dioxide. According to the IPCC, strong, rapid, and sustained methane reductions are critical to reducing near-term disruption of the climate system and a vital complement to CO_2 reductions critical in limiting the long-term extent of climate change and its destructive impacts.[161] The EPA previously determined, in the 2016 NSPS OOOOa Rule, both that it had a rational basis to regulate methane emissions from the source category, and, in the alternative, that methane emissions from the Crude Oil and Natural Gas Source Category, contribute significantly to dangerous air pollution. 81 FR 35842-43, (September 14, 2020). The EPA is not reopening those determinations for comment in the present rulemaking.

Contrary to the statements in the 2020 Policy rule, the methane NSPS promulgated in the 2016 rule cannot be said to be redundant with the VOC NSPS and therefore unnecessary. The large contribution of methane emissions from the source category to dangerous air pollution driving the grave and growing threat of climate change means that, in the agency's judgment, it would be highly irresponsible and also arbitrary and capricious under CAA section 307(d)(9)(A) for the EPA to decline to promulgate NSPS for methane emissions from the source category. *See American Electric Power*, 564 U.S. at 426-27. The fact that the EPA designed the methane NSPS so that sources could comply with them efficiently, through the same actions that the sources needed to take to comply with the VOC NSPS, did not thereby create redundancy. Further, the

[161] See preamble section III for further discussion on the Crude Oil and Natural Gas Emissions and Climate Change, including discussion of the GHGs, VOCs and SO_2 Emissions on Public Health and Welfare.

fact that methane NSPS but not the VOC NSPS trigger the regulatory requirements for existing sources makes clear that the two sets of requirements are not redundant. Indeed, if EPA had only regulated VOCs, it would only have been authorized to regulate new and modified sources, which comprise a small subset of polluting sources. By contrast, because the 2016 Rule also regulated methane, EPA was authorized and obligated to regulate hundreds of thousands of additional "existing" sources that comprise the vast majority of polluting sources. Accordingly, methane regulation was not "redundant" of VOC regulation. The 2020 Policy Rule's contrary position was based on a misinterpretation of CAA section 111 which overlooked that the provision integrates requirements for new and existing sources. See *Nat'l Lime Ass'n v. EPA*, 627 F.2d 416, 433 n.48 (D.C. Cir. 1980) (CAA section 111(b)(1)(A) listing of a source category is based on emissions from new and existing sources).

The EPA also reaffirms the 2016 rule's statutory interpretation that the EPA is authorized to promulgate a NSPS for an air pollutant under CAA section 111(b)(1)(B) in a situation in which the EPA has previously determined that the source category causes or contributes significantly to dangerous air pollution and where the EPA has a rational basis for regulating the particular air pollutant in question that is emitted by the source category. 81 FR 35842 (June 3, 2016). The 2016 rule noted the precedent in prior agency actions for the position that – following the listing of a source category – the EPA need provide only a rational basis for its exercise of discretion for which pollutants to regulate under section 111(b)(1)(B). *See id.* (citing *National Lime Assoc. v. EPA*, 627 F.2d 416, 426 & n.27 (D.C. Cir. 1980) (court discussed, but did not review, the EPA's reasons for not promulgating standards for NO_x, SO_2 and CO from lime plants). In addition, the Supreme Court in *American Electric Power* provided support for the

rational basis statutory interpretation. 564 U.S. at 426-27 ("EPA [could] decline to regulate carbon-dioxide emissions altogether at the conclusion of its … [CAA section 111] rulemaking," and such a decision "would not escape judicial review," under the "arbitrary and capricious" standard of section 307(d)(9)(A)). As the House Report noted, the EPA's rational basis interpretation "is fully consistent with the provision[s] of section 111 and the section 307(d)(9) 'arbitrary and capricious' standard." House Report at 9.

The 2020 Policy Rule correctly noted that the CAA section 111(b)(1)(B) requirement that the EPA "shall promulgate … standards [of performance]" for air pollutants, coupled with the CAA section 111(a)(1) definition for "standard of performance" as, in relevant part, a "standard for emissions of air pollutants," does not by its terms require that EPA promulgate NSPS for every air pollutant from the source category. But the rule erred in seeking to graft the CAA section 111(b)(1)(A) requirement for a SCF into CAA section 111(b)(1)(B). The language of CAA section 111(b)(1)(A) is clear: it requires the EPA Administrator to "include a *category of sources* in [the list for regulation] if in his judgment it causes, or contributes to, air pollution which may reasonably be anticipated to endanger public health or welfare." (Emphasis added.) Congress thus specified that the required SCF is made on a category basis, not a pollutant-specific basis, and that once that finding is made (as it was for the Crude Oil and Natural Gas source category in 1979), the EPA may establish standards for pollutants emitted by the source category. In determining for which air pollutants to promulgate standards of performance, the EPA must act rationally, which, as noted above, essentially must ensure that the action does not fail the "arbitrary and capricious" standard under CAA section 307(d)(9)(A). The 2020 Policy Rule's objections to the rational basis standard on grounds that is "vague and not guided by any

statutory criteria," 85 FR 57034 (September 14, 2020), is incorrect. In making a rational basis determination, the EPA has considered the amount of the air pollutant emitted by the source category, both in absolute terms and by drawing comparisons, as well as the availability of control technologies. *See National Lime Assoc. v. EPA*, 627 F.2d 416, 426 & n.27 (D.C. Cir. 1980) (discussing EPA's reasons for not promulgating standards for NOx, SO_2 and CO from lime plants); 80 FR 64510, 64530 (October 23, 2015) (rational basis determination for GHGs from fossil fuel-fired electricity generating power plants); 73 FR 35838, 35859–60 (June 24, 2008) (providing reasons why the EPA was not promulgating GHG standards for petroleum refineries). Courts routinely review rules under the "arbitrary and capricious" standard, as noted in the House Report, at 11.

When the EPA is required to make an endangerment finding, the EPA also affirms that that finding should be made in consideration of the particular facts and circumstances, not a predetermined threshold. Accordingly, the EPA rejects the 2020 Policy Rule's position to the contrary. Section 111(b)(1)(A) of the CAA does not require that the SCF for the source category be based on "established criteria" or "standard or threshold." *See Coal. for Responsible Regulation, Inc. v. EPA*, 684 F.3d 102, 122-23 (D.C. Cir. 2012) ("the inquiry [into whether an air pollutant endangers] necessarily entails a case-by-case, sliding-scale approach.... EPA need not establish a minimum threshold of risk or harm before determining whether an air pollutant endangers"). During the 50 years that it has made listing decisions, the EPA has always relied on the individual facts and circumstances. *See Alaska Dep't of Envtl. Conservation,* 540 U.S. 461, 487 (2004) (explaining, in a case under the CAA, "[w]e normally accord particular deference to an agency interpretation of longstanding duration" (internal quotation marks omitted) (citing

Barnhart v. Walton, 535 U.S. 212, 220 (2002)). This approach is appropriate because Congress intended that CAA section 111 apply to a wide range of source categories and pollutants, from wood heaters to emergency backup engines to petroleum refineries. In that context, it reasonable to interpret section 111 to allow EPA the discretion to determine how best to assess significant contribution and endangerment based on the individual circumstances of each source category. On this point, as well, the EPA is in full agreement with the statements in the House Report. House Report at 9-10.

Finally, under CAA section 111(d)(1), once the EPA promulgates NSPS for certain air pollutants, including GHGs, the EPA is required to promulgate regulations, which the EPA terms EG, 40 CFR 60.22a, that in turn require States to promulgate standards of performance for existing sources of those air pollutants. The EPA agrees with the House Report and Senate statement that it is imperative to regulate methane emissions from the existing oil and gas sources that comprise the vast majority of polluting sources expeditiously under the authority of CAA section 111(d) and is proceeding with the process to do so in this rulemaking by publishing proposed EG. See section III.B.2. In 2019, the GHGI estimates for oil and natural gas production, and natural gas processing and transmission and storage segments that methane emissions equate to 182 MMT CO_2 Eq.[162] In the U.S. the EPA has identified over 15,000 oil and

[162] The 100-year GWP value of 25 for methane indicates that one ton of methane has approximately as much climate impact over a 100-year period as 25 tons of CO_2. The most recent IPCC AR6 assessment has estimated a slightly larger 100-year GWP of methane of almost 30 (specifically, either 27.2 or 29.8 depending on whether the value includes the CO_2 produced by the oxidation of methane in the atmosphere). As mentioned earlier, because methane has a shorter lifetime than CO_2, the emissions of a ton of methane will have more impact earlier in the 100-year timespan and less impact later in the 100-year timespan relative to the emissions of a 100-year GWP-equivalent quantity of CO_2. See preamble section III for further discussion on the

gas owners and operators, around 1 million producing onshore oil and gas wells, about 5,000 gathering and boosting facilities, over 650 natural gas processing facilities, and about 1,400 transmission compression facilities.

Some stakeholders have raised issues concerning the scope of pollutants subject to CAA section 111(d) by arguing that the exclusion in CAA section 111(d) for HAP covers not only those pollutants listed for regulation under CAA section 112, but also precludes the EPA from regulating a source category under CAA section 111(d) for *any* pollutant if that source category has been regulated under CAA section 112. The EPA agrees with its longstanding legal interpretation spanning multiple Administrations that the 111(d) exclusion does not preclude the agency from regulating a non-HAP pollutant from a source category under section 111(d) even if that source category is regulated under section 112. See *American Lung Ass'n v. EPA*, 980 F.3d 914, 980 (D.C. Cir. 2019) (referring to "EPA's three-decade-old … reading of the statutory amendments"), *petition for cert. pending* No. 20-1530 (filed April 29, 2021); 59 FR 15994, 16029 (March 29, 2005) (Clean Air Mercury Rule); 80 FR 64662, 64710 (Oct. 23, 2015) (Clean Power Plan); 84 FR 32520, (July 8, 2019) (Affordable Clean Energy Rule). The House Report agreed with this interpretation, noting that the contrary position is flawed because it ignores the overall statutory structure that Congress created in the CAA and would create regulatory gaps in which the EPA would not be able to regulate existing sources for some pollutants (such as methane) under CAA section 111(d) if those sources (but not pollutants) were already regulated

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for different pollutants under CAA section 112. House Report at 11-12. Moreover, the D.C. Circuit recently considered this precise issue and held that the EPA may both regulate a source category for HAP under CAA section 112 and regulate that same source category for different pollutants under CAA section 111(d). *Am. Lung Assoc.,* 985 F.3d at 977-988. Accordingly, both Congress and the court have come to the same conclusion after reviewing the statutory language, a conclusion that is aligned with the EPA's longstanding position. We therefore proceed in the proposal to propose EGs for existing sources in the oil and gas source category.

IX. Overview of Control and Control Costs

A. Control of Methane and VOC Emissions in the Crude Oil and Natural Gas Source Category-Overview

As described in this action, the EPA reviewed the standards in the 2016 NSPS OOOOa pursuant to CAA section 111(b)(1)(B). Based on this review, the EPA is proposing revisions to the standards for a number of affected facilities to reflect the updated BSER for those affected facilities. Where our analyses show that the BSER for an affected facility remains the same, the EPA is proposing to retain the current standard for that affected facility. In addition to the actions on the standards in the 2016 NSPS OOOOa described in this section, the EPA is proposing standards for GHGs (in the form of limitation on methane) and VOCs for a number of new sources that are currently unregulated. The proposed NSPS OOOOb would apply to new, modified, and reconstructed emission sources across the Crude Oil and Natural Gas source category for which construction, reconstruction, or modification is commenced after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

Further, pursuant to CAA section 111(d), the EPA is proposing EG, which include presumptive standards for GHGs (in the form of limitations on methane) (designated pollutant),

for certain existing emission sources across the Crude Oil and Natural Gas source category in the proposed EG OOOOc. While the proposed requirements in NSPS OOOOb would apply directly to new sources, the proposed requirements in EG OOOOc are for States to use in the development of plans that establish standards of performance that will apply to existing sources (designated facilities).

B. How does EPA evaluate control costs in this action?

Section 111 of the CAA requires that the EPA consider a number of factors, including cost, in determining "the best system of emission reduction . . . adequately demonstrated." CAA section 111(a)(1). The D.C. Circuit has long recognized that "[CAA] section 111 does not set forth the weight that [] should [be] assigned to each of these factors;" therefore, "[the court has] granted the agency a great degree of discretion in balancing them." *Lignite Energy Council v. EPA*, 198 F.3d 930, 933 (D.C. Cir. 1999) ("*Lignite Energy Council*"). In *Essex Chemical Corp. v. Ruckelshaus*, 486 F.2d 427 (D.C. Cir. 1973) *("Essex Chemical")*, the court noted that "it is not unlikely that the industry and the EPA will disagree on the economic costs of various control techniques" and that it "has no desire or special ability to settle such a dispute." *Id.* at 437. Rather, the court focused its review on "whether the standards as set are the result of reasoned decision-making." *Id.* at 434. A standard that "is the result of the exercise of reasoned discretion by the Administrator [] cannot be upset by this Court." *Id.* at 437.

As noted, CAA section 111 requires that the EPA consider cost in determining such system (*i.e.,* ''BSER''), but it does not prescribe any criteria for such consideration. The courts have recognized that the EPA has "considerable discretion under [CAA] section 111," *Lignite Energy Council*, 198 F.3d at 933, on how it considers cost under CAA section 111(a)(1). For

example, in *Essex Chemical*, the D.C. Circuit stated that to be "adequately demonstrated," the system must be "reasonably reliable, reasonably efficient, and . . . reasonably expected to serve the interests of pollution control without becoming exorbitantly costly in an economic or environmental way." 486 F.2d at 433. The court has reiterated this limit in subsequent case law, including *Lignite Energy Council*, in which it stated: "EPA's choice will be sustained unless the environmental or economic costs of using the technology are exorbitant." 198 F.3d at 933. In *Portland Cement Association v. Train,* the court elaborated by explaining that the inquiry is whether the costs of the standard are "greater than the industry could bear and survive."[163] 513 F.2d 506, 508 (D.C. Cir. 1975). In *Sierra Club v. Costle*, the court provided a substantially similar formulation of the cost factor: "EPA concluded that the Electric Utilities' forecasted cost was not excessive and did not make the cost of compliance with the standard unreasonable. This is a judgment call with which we are not inclined to quarrel." 657 F.2d 298, 343 (D.C. Cir. 1981). We believe that these various formulations of the cost factor— "exorbitant," "greater than the industry could bear and survive," "excessive," and "unreasonable"—are synonymous; the D.C. Circuit has made no attempt to distinguish among them. For convenience, in this rulemaking, we will use the term "reasonable" to describe that our evaluation of costs is well within the boundaries established by this case law.

In evaluating whether the cost of a control is reasonable, the EPA considers various costs

[163] The 1970 Senate Committee Report on the Clean Air Act stated: "The implicit consideration of economic factors in determining whether technology is 'available' should not affect the usefulness of this section. The overriding purpose of this section would be to prevent new air pollution problems, and toward that end, maximum feasible control of new sources at the time of their construction is seen by the committee as the most effective and, in the long run, the least expensive approach." S. Comm. Rep. No. 91–1196 at 16.

associated with such control, including capital costs and operating costs, and the emission reductions that the control can achieve. As discussed further below, the agency considers these costs in the context of the industry's overall capital expenditures and revenues. Cost-effectiveness analysis is also a useful metric, and a means of evaluating whether a given control achieves emission reduction at a reasonable cost. A cost-effectiveness analysis also allows comparisons of relative costs and outcomes (effects) of two or more options. In general, cost-effectiveness is a measure of the outcomes produced by resources spent. In the context of air pollution control options, cost-effectiveness typically refers to the annualized cost of implementing an air pollution control option divided by the amount of pollutant reductions realized annually. A cost-effectiveness analysis is not intended to constitute or approximate a benefit-cost analysis in which monetized benefits are compared to costs, but rather provides a metric to compare the relative cost and emissions impacts of various control options.

The estimation and interpretation of cost-effectiveness values is relatively straightforward when an abatement measure is implemented for the purpose of controlling a single pollutant, such as for the controls included as presumptive standards in the proposed EG OOOOc to address methane emissions from existing sources in the Crude Oil and Natural Gas source category. In other circumstances, air pollution reduction programs require reductions in emissions of multiple pollutants, as with the NSPS for the Crude Oil and Natural Gas source category, which regulates both GHG and VOC. In such cases, multipollutant controls (controls that achieve reductions of both pollutants through the same techniques and technologies) may be employed, and consequently, there is a need for determining cost-effectiveness for a control option across multiple pollutants (or classes of multiple pollutants).

During the rulemaking for NSPS OOOOa, we evaluated a number of approaches for considering the cost-effectiveness of the available multipollutant controls for reducing both methane and VOC emissions. See 80 FR 56593, 56616 (September 18, 2015). In that rulemaking, we used two approaches for considering the cost-effectiveness of control options that reduce both VOC and methane emissions; we are proposing to use these same two cost-effectiveness approaches, along with other factors discussed further below, in considering the cost of requiring control for the proposed NSPS OOOOb. One approach, which we refer to as the "single pollutant cost-effectiveness approach," assigns all costs to the emission reduction of one pollutant and zero to all other concurrent reductions. If the cost is reasonable for reducing any of the targeted pollutants alone, the cost of such control is clearly reasonable for the concurrent emission reduction of all the other regulated pollutants because they are being reduced at no additional cost. While this approach assigns all costs to only a portion of the emission reduction and thus may overstate the cost for that assigned portion, it does not overstate the overall cost. Instead, it acknowledges that the reductions of the other regulated pollutant are intended as opposed to incidental. This approach is simple and straightforward in application: if the multipollutant control is cost effective for reducing emissions of either of the targeted pollutants, it is clearly cost effective for reducing all other targeted emissions that are being achieved simultaneously.

A second approach, which we term for the purpose of this rulemaking a "multipollutant cost-effectiveness approach," apportions the annualized cost across the pollutant reductions addressed by the control option in proportion to the relative percentage reduction of each pollutant controlled. In the case of the Crude Oil and Natural Gas source category, both methane

and VOC are reduced in equal proportions, relative to their respective baselines by the multipollutant control option (*i.e.,* where control is 95 percent reduction, methane and VOC are both simultaneously reduced by 95 percent by the multipollutant control). As a result, under the multipollutant cost-effectiveness approach, half of the control costs are allocated to methane and the other half to VOC. Under this approach, control is cost effective if it is cost effective for both VOC and methane.

We believe that both the single pollutant and multipollutant cost-effectiveness approaches discussed above are appropriate for assessing the reasonableness of the multipollutant controls considered in this action for new sources. As such, in the individual BSER analyses in section XII below, if a device is cost-effective under either of these two approaches, we find it to be cost-effective. The EPA has considered similar approaches in the past when considering multiple pollutants that are controlled by a given control option.[164] The EPA recognizes, however, not all situations where multipollutant controls are applied are the same, and that other types of approaches might be appropriate in other instances.

As mentioned above, as part of its consideration of control costs in the individual BSER analyses in Section XII, the EPA evaluated cost-effectiveness using the single pollutant and multipollutant cost-effectiveness approaches. We estimated the cost-effectiveness values of the proposed control options using available information, including various studies, information submitted in previous rulemakings from the affected industry, and information provided by small businesses. The EPA provides the cost effectiveness estimates for reducing VOC and methane

[164] See *e.g.*, 73 FR 64079–64083 and EPA Document I.D. EPA–HQ–OAR–2004–0022–0622, EPA–HQ–OAR–2004–0022–0447, EPA–HQ–OAR– 2004–0022–0448.

emissions for various control options considered in section XII. As discussed in that section, the EPA finds cost-effectiveness values up to $5,540/ton of VOC reduction to be reasonable for controls that we have identified as BSER in this proposal. These VOC values are within the range of what the EPA has historically considered to represent cost effective controls for the reduction of VOC emissions, including in the 2016 NSPS, based on the Agency's long history of regulating a wide range of industries. With respect to methane, the EPA finds the cost-effectiveness values up to $1,800/ton of methane reduction to be reasonable for controls that we have identified as BSER in this proposal. Unlike VOC, the EPA does not have a long regulatory history to draw upon in assessing the cost effectiveness of controlling methane, as the 2016 NSPS OOOOa was the first national standard for reducing methane emissions. However, as explained below, the EPA has previously determined that methane cost-effectiveness values for the controls identified as BSER for the 2016 NSPS OOOOa, which range up to $2,185/ton of methane reduction, represent reasonable costs for the industry as a whole to bear; and because the cost-effectiveness estimates for the proposed standards in this action are comparable to the cost-effectiveness values estimated for the controls that served as the basis (*i.e.,* BSER) for the standards in the 2016 NSPS OOOOa, we consider the proposed standards to also be cost effective and reasonable.

The BSER determinations from the 2016 NSPS OOOOa also support the EPA's conclusion that the cost-effectiveness values associated with the proposed standards in this action are reasonable. As mentioned above, for 2016 NSPS OOOOa, the highest estimate that the EPA considered cost effective for methane reduction was $2,185/ton, which was the estimate for converting a natural gas driven diaphragm pump to an instrument air pump at a gas processing

plant.[165,166] 80 FR 56627; see also, NSPS OOOOa Final TSD at 93, Table 6-7. The EPA estimated that the cost-effectiveness of this option, a common practice at gas processing plants, could be up to $2,185/ton of methane reduction under the single pollutant cost-effectiveness approach and $1,093/ton under the multipollutant cost effectiveness approach; the EPA found "the control to be cost effective under either approach." *Id.* Accordingly, the EPA finalized requirements in the 2016 NSPS OOOOa that require zero emissions from diaphragm pumps at gas processing plants, consistent with the Agency's BSER determination.

The 2016 NSPS OOOOa also requires 95 percent methane and VOC emission reduction from wet-seal centrifugal compressors. The BSER for this standard was capturing and routing the emissions to a control combustion device, a widely used control in the oil and gas sector for reducing emissions from storage vessels and pumps, in addition to centrifugal compressors. 80 FR 56620. The EPA estimated cost-effectiveness values of up to $1,093/ton of methane

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[165] As discussed in section X.A, the EPA incorrectly stated in the 2020 Technical Rule that $738/ton of methane reduction was the highest cost-effectiveness value that the EPA determined to be reasonable for methane reduction in the 2016 NSPS OOOOa.

[166] While in that rulemaking the EPA found quarterly monitoring of fugitive emissions at well sites not cost effective at $1,960/ton of methane reduced using the single pollutant approach (and $980 using the multi-pollutant approach), the EPA emphasized that this conclusion was not intended to "preclude the EPA from taking a different approach in the future including requiring more frequent monitoring *(e.g.,* quarterly)." 81 FR 35855-6 referencing *Background Technical Support Document for the New Source Performance Standards 40 CFR part 60 subpart OOOOa* (May 2016), at 49, Table 4-11 and 52, Table 4-14. Further, several states have issued regulations and industry has voluntarily taken steps to reduce emissions. This combined with greater knowledge and understanding of the industry leads us to find these values cost-effective. As discussed in this section IX.B, cost-effectiveness is one – not the only – factor in EPA's consideration of control costs. In fact, in this action, the EPA is proposing different monitoring frequencies based on well site baseline emissions, even though the EPA found quarterly monitoring to be cost effective for all well sites. Please see section XII.A for a detailed discussion on this proposal.

reduction for this option. *See* NSPS OOOOa Final TSD at 114, Table 7-9. With respect to other controls identified as BSER in the 2016 NSPS OOOOa, their cost-effectiveness estimates were comparable to or well below the estimates from the 2016 NSPS OOOOa rulemaking discussed above. In light of this, and because sources have been complying with the 2016 NSPS OOOOa for years, we believe that the cost-effectiveness values for the controls identified as BSER for the 2016 NSPS OOOOa, which range up to $2,185/ton of methane reduction, represent reasonable, rather than excessive, costs for the industry as a whole to bear. As shown in the individual BSER analyses in Section XII and the NSPS OOOOb and EG OOOOc TSD for this proposal, the cost-effectiveness values for the proposed standards in this action are comparable to the cost-effectiveness values for the standards in NSPS OOOOa. We, therefore, similarly consider the cost-effectiveness values for the proposed standards to be reasonable. That the proposed standards reflect the kinds of controls that many companies and sources around the country are already implementing underscore the reasonableness of these control measures.

In addition to evaluating the annual average cost-effectiveness of a control option, the EPA also considers the incremental costs associated with increasing the stringency of the standards from one level of control to another level of control that achieves more emission reductions. The incremental cost of control provides insight into how much it costs to achieve the next increment of emission reductions through application of each increasingly stringent control options, and thus is a useful tool for distinguishing among the effects of more and less stringent control options. For example, during the rulemaking for the 2012 NSPS OOOO, the EPA considered the incremental cost effectiveness of changing the originally promulgated standards for leaks at gas processing plants, which were based on NSPS subpart VV, to the more stringent

NSPS subpart VVa-level program. See 76 FR 52738, 52755 (August 23, 2011). The EPA generally finds the incremental cost-effectiveness to be reasonable if it is consistent with the costs that the Agency considers reasonable in its evaluation of annual average cost-effectiveness.

As shown in the NSPS OOOOb and EG OOOOc TSD for this action, the EPA estimated control costs both with and without savings from recovered gas that would otherwise be emitted. When determining the overall costs of implementation of the control technology and the associated cost-effectiveness, the EPA reasonably takes into account any expected revenues from the sale of natural gas product that would be realized as a result of avoided emissions that result from implementation of a control. Such a sale would offset regulatory costs and so should be included to accurately assess the overall costs and the cost-effectiveness of the standard. In our analysis we consider any natural gas that is either recovered or that is not emitted as a result of a control option as being "saved." We estimate that one thousand standard cubic feet (Mcf) of natural gas is valued at $3.13 per Mcf.[167] Our cost analysis then applies the monetary value of the saved natural gas as an offset to the control cost.[168] This offset applies where, in our estimation, the monetary savings of the natural gas saved can be realized by the affected facility owner or operator and not where the owner or operator does not own the gas and would not likely realize the monetary value of the natural gas saved (*e.g.,* transmission stations and storage facilities). Detailed discussions of these assumptions are presented in section 2 of the RIA

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[167] This value reflects the forecasted Henry Hub price for 2022 from: U.S. Energy Information Administration. Short-Term Energy Outlook. *https://www.eia.gov/outlooks/steo/archives/may21.pdf*. Release Date: May 11, 2021.

[168] While the EPA presents cost-effectiveness with and without cost savings, the BSER is determined based on the cost-effectiveness without cost savings in all cases.

associated with this action, which is in the docket.

We also completed two additional analyses to further inform our determination of whether the cost of control is reasonable, similar to compliance cost analyses we have completed for other NSPS.[169] First, we compared the capital costs that would be incurred to comply with the proposed standards to the industry's estimated new annual capital expenditures. This analysis allowed us to compare the capital costs that would be incurred to comply with the proposed standards to the level of new capital expenditures that the industry is incurring in the absence of the proposed standards. We then determined whether the capital costs appear reasonable in comparison to the industry's current level of capital spending. Second, we compared the annualized costs that would be incurred to comply with the standards to the industry's estimated annual revenues. This analysis allowed us to evaluate the annualized costs as a percentage of the revenues being generated by the industry.

The EPA has evaluated incremental capital costs in a manner similar to the analyses described above in prior new source performance standards, and in those prior standards, the Agency's determinations that the costs were reasonable were upheld by the courts. For example, the EPA estimated that the costs for the 1971 NSPS for coal-fired electric utility generating units were $19 million for a 600 MW plant, consisting of $3.6 million for particulate matter controls, $14.4 million for sulfur dioxide controls, and $1 million for nitrogen oxides controls, representing a total 15.8 percent increase in capital costs above the $120 million cost of the

[169] For example, see our compliance cost analysis in ''Regulatory Impact Analysis (RIA) for Residential Wood Heaters NSPS Revision. Final Report.'' U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. EPA– 452/R–15–001, February 2015.

plant.[170] *See* 1972 Supplemental Statement, 37 FR 5767, 5769 (March 21, 1972). The D.C. Circuit upheld the EPA's determination that the costs associated with the final 1971 standard were reasonable, concluding that the EPA had properly taken costs into consideration. *Essex Chemical*, 486 F. 2d at 440. Similarly, in *Portland Cement Association v. Ruckelshaus*, the D.C. Circuit upheld the EPA's consideration of costs for a standard of performance that would increase capital costs by about 12 percent, although the rule was remanded due to an unrelated procedural issue. 486 F.2d 375, 387-88 (D.C. Cir. 1973). Reviewing the EPA's final rule after remand, the court again upheld the standards and the EPA's consideration of costs, noting that "[t]he industry has not shown inability to adjust itself in a healthy economic fashion to the end sought by the Act as represented by the standards prescribed." *Portland Cement Assn. v. Train*, 513 F. 2d at 508.

In this action, for the capital expenditures analysis, we divide the nationwide capital expenditures projected to be spent to comply with the proposed standards by an estimate of the total sector-level new capital expenditures for a representative year to determine the percentage that the nationwide capital cost requirements under the proposal represent of the total capital expenditures by the sector. We combine the compliance-related capital costs under the proposed standards for the NSPS and for the presumptive standards in the proposed EG to analyze the potential aggregate impact of the proposal. The EAV of the projected compliance-related capital

[170] Assuming these costs were denominated in 1971 dollars, converting the costs from 1971 to 2019 dollars using the Gross Domestic Product-Implicit Price Deflator, the costs for the 1971 NSPS for coal-fired electric utility generating units were $94 million for a 600 MW plant, consisting of $18 million for particulate matter controls, $71 million for sulfur dioxide controls, and $5 million for nitrogen oxides controls, representing a 15.8 percent increase in capital costs above the $590 million cost of the plant.

expenditures over the 2023 to 2035 period is projected to be about $510 million in 2019 dollars. We obtained new capital expenditure data for relevant NAICS codes for 2018 from the U.S. Census 2019 Annual Capital Expenditures Survey.[171] Estimates of new capital expenditures are available for 2019, but we chose to use 2018 because the 2019 new capital expenditure data for pipeline transportation of natural gas (NAICS 4862) are withheld to avoid disclosing data for individual enterprises, and the withholding of that NAICS causes the totals for 2019 to be lower than for 2018. According to these data, new capital expenditures for the sector in 2018 were about $155 billion in 2019 dollars. Comparing the EAV of the projected compliance-related capital expenditures under the proposal with the 2018 total sector-level new capital expenditures yields a percentage of about 0.3 percent, which is well below the percentage increase previously upheld by the courts, as discussed above.

For the comparison of compliance costs to revenues, we use the EAV of the projected compliance costs without and with projected revenues from product recovery under the proposal for the 2023 to 2035 period then divided the nationwide annualized costs by the annual revenues for the appropriate NAICS code(s) for a representative year to determine the percentage that the nationwide annualized costs represent of annual revenues. Like we do for capital expenditures, we combine the costs projected to be expended to comply with the standards for NSPS and the presumptive standards in the proposed EG to analyze the potential aggregate impact of the proposal. The EAV of the associated increase in compliance cost over the 2023 to 2035 period is projected to be about $1.2 billion without revenues from product recovery and about $760

[171] U.S. Census Bureau, 2019 Annual Capital Expenditures Survey, Table 4b. Capital Expenditures for Structures and Equipment for Companies With Employees by Industry: 2018 Revised, *http://www.census.gov/econ/aces/index.html*, accessed September 4, 2021.

million with revenues from product recovery (in 2019 dollars). Revenue data for relevant NAICS codes were obtained from the U.S. Census 2017 County Business Patterns and Economic Census, the most recent revenue figures available.[172] According to these data, 2018 receipts for the sector were about $358 billion in 2019 dollars. Comparing the EAV of the projected compliance costs under the proposal with the sector-level receipts figure yields a percentage of about 0.3 percent without revenues from product recovery and about 0.2 percent with revenues from product recovery. More data and analysis supporting the comparison of capital expenditures and annualized costs projected to be incurred under the rule and the sector-level capital expenditures and receipts is presented in Chapter 15 of the TSD for this action, which is in the public docket.

In considering the costs of the control options evaluated in this action, the EPA estimated the control costs under various approaches, including annual average cost-effectiveness and incremental cost-effectiveness of a given control. The EPA also performed two broad comparisons to consider the costs of control: First, we compared the projected compliance-related capital expenditures to recent sector-level capital expenditures; second, we compared the projected total compliance costs to recent sector-level annual revenues. In its cost-effectiveness analyses, the EPA recognized and took into account that these multi-pollutant controls reduce both VOC and methane emissions in equal proportions, as reflected in the single-pollutant and multipollutant cost effectiveness approaches. The EPA also considered cost saving from the

[172] 2017 County Business Patterns and Economic Census. The Number of Firms and Establishments, Employment, Annual Payroll, and Receipts by Industry and Enterprise Receipts Size: 2017, *https://www.census.gov/programs-surveys/susb/data/tables.2017.html*, accessed September 4. 2021.

natural gas recovered instead of vented due to the proposed controls. Based on all of the considerations described above, the EPA concludes that the costs of the controls that serve as the basis of the standards proposed in this action are reasonable. The EPA solicits comment on its approaches for considering control costs, as well as the resulting analyses and conclusions.

X. Summary of Proposed Action for NSPS OOOOa

As described above in sections IV and VIII, the 2020 Policy Rule rescinded all NSPS regulating emissions of VOC and methane from sources in the natural gas transmission and storage segment of the Oil and Natural Gas Industry and NSPS regulating methane from sources in the industry's production and processing segments. As a result, the 2020 Technical Rule only amended the VOC standards for the production and processing segments in the 2016 NSPS OOOOa, because those were the only standards that remained at the time that the 2020 Technical Rule was finalized. The 2020 Technical Rule included amendments to address a range of technical and implementation issues in response to administrative petitions for reconsideration and other issues brought to the EPA's attention since promulgating the 2016 NSPS. These included, among other issues, those associated with the implementation of the fugitive emissions requirements and pneumatic pump standards, provisions to apply for the use of an AMEL, provisions for determining applicability of the storage vessel standards, and modification to the engineer certifications. In 2018, the EPA proposed amendments to address these technical issues for both the methane and VOC standards in the 2016 NSPS OOOOa, and in some instances for sources in the transmission and storage segment. 83 FR 52056, October 15, 2018. However, because the methane standards and all standards for the transmission and storage segment were removed via the 2020 Policy Rule prior to the finalization of the 2020 Technical Rule, the final

amendments in the 2020 Technical Rule apply only to the 2016 NSPS OOOOa VOC standards for the production and processing segments. Additionally, the 2020 Policy Rule amended the 2012 NSPS OOOO to remove the VOC requirements for sources in the transmission and storage segment, but the Technical Rule did not amend the 2012 NSPS OOOO.

Under the CRA, a rule that is subject to a joint resolution of disapproval "shall be treated as though such rule had never taken effect." 5 U.S.C. 801(f)(2). Thus, because it was disapproved under the CRA, the 2020 Policy Rule is treated as never having taken effect. As a result, the requirements in the 2012 NSPS OOOO and 2016 NSPS OOOOa that the 2020 Policy Rule repealed (*i.e.,* the VOC and methane standards for the transmission and storage segment, as well as the methane standards for the production and processing segments) must be treated as being in effect immediately upon enactment of the joint resolution on June 30, 2021. Any new, reconstructed, or modified facility that would have been subject to the 2012 or 2016 NSPS ("affected facility") but for the 2020 Policy Rule was subject to those NSPS as of that date. The CRA resolution did not address the 2020 Technical Rule; therefore, the amendments made in the 2020 Technical Rule, which apply only to the VOC standards for the production and processing segments in the 2016 NSPS OOOOa, remain in effect. As a result, sources in the production and processing segments are now subject to two different sets of standards:[173] one for methane based on the 2016 NSPS OOOOa, and one for VOC that include the amendments to the 2016 NSPS OOOOa made in the 2020 Technical Rule. Sources in the transmission and storage segment are subject to the methane and VOC standards as promulgated in either the 2012 NSPS OOOO or

[173] The only exception is storage vessels, for which the EPA did not promulgate methane standards in the 2016 NSPS OOOOa.

the 2016 NSPS OOOOa, as applicable.[174] The EPA recognizes that certain amendments made to the VOC standards in the 2016 NSPS OOOOa in the 2020 Technical Rule, which addressed technical and implementation issues in response to administrative petitions for reconsideration and other issues brought to the EPA's attention since promulgating the 2016 NSPS OOOOa rule could also be appropriate to address similar implementation issues associated with the methane standards for the production and processing segments and the methane and VOC standards for the transmission and storage segment. In fact, as mentioned above, such revisions were proposed in 2018 but not finalized because these standards were removed by the 2020 Policy Rule prior to the EPA's promulgation of the 2020 Technical Rule. In light of the above, the EPA is proposing to revise 40 CFR part 60, subpart OOOOa to apply certain amendments made in the 2020 Technical Rule to the 2016 NSPS OOOOa for methane from the production and processing segments and/or the 2016 NSPS OOOOa for methane and VOC from the transmission and storage segment, as specified in this section.

In this action, the EPA is proposing amendments to the 2016 NSPS OOOOa to (1) rescind the revisions to the VOC fugitive emissions monitoring frequencies at well sites and gathering and boosting compressor stations in the 2020 Technical Rule as those revisions were not supported by the record for that rule, or by our subsequent information and analysis, and (2) adjust other modifications made in the 2020 Technical Rule to address technical and implementation issues that result from the CRA disapproval of the 2020 Policy Rule. The EPA is not reopening any of these prior rulemakings for any other purpose in this proposed action.

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[174] For the EPA's full explanation of its initial guidance to stakeholders on the impact of the CRA, please see *https://www.epa.gov/system/files/documents/2021-07/qa_cra_for_2020_oil_and_gas_policy_rule.6.30.2021.pdf.*

Specifically, the EPA is not reopening any of the determinations made in the 2012 NSPS OOOO. In the final rule for this action, the EPA will update the NSPS OOOO and NSPS OOOOa regulatory text in the CFR to reflect the CRA resolution's disapproval of the final 2020 Policy Rule, specifically, the reinstatement of the NSPS OOOO and NSPS OOOOa requirements that the 2020 Policy Rule repealed but that came back into effect immediately upon enactment of the CRA resolution. In accordance with 5 U.S.C. 553(b)(3)(B), the EPA is not soliciting comment on these updates. Moreover, the EPA is not reopening the methane standards as finalized in the 2016 NSPS OOOOa, except as to the specific issues discussed below, nor is the EPA reopening any other portions of the 2016 Rule. The EPA is also not reopening any determinations made in the 2020 Technical Rule, except as to the specific issues discussed below. Finally, the reopening of determinations made with respect to the VOC standards in the 2020 Technical Rule does not indicate any intent to also reopen the methane standards for the same affected facilities.

A. Amendments to Fugitive Emissions Monitoring Frequency

The EPA is proposing to repeal its amendments in the 2020 Technical Rule that (1) exempted low production well sites from monitoring fugitive emissions and (2) changed from quarterly to semiannual monitoring of VOC emissions at gathering and boosting compressor stations. The EPA has authority to reconsider a prior action "as long as 'the new policy is permissible under the statute. . . , there are good reasons for it, and . . . the agency *believes* it to be better.'" *FCC v. Fox Television Stations, Inc., 556 U.S. 502, 515, 129 S. Ct. 1800, 173 L. Ed. 2d738 (2009).*

The 2016 NSPS OOOOa, as initially promulgated, required semiannual monitoring of VOC and methane emissions at all well sites, including low production well sites. It also

required quarterly monitoring of compressor stations, including gathering and boosting compressor stations. After issuing the 2020 Policy Rule, which removed all methane standards applicable to the production and processing segments and all methane and VOC standards applicable to the transmission and storage segment, the EPA promulgated the 2020 Technical Rule that further amended the VOC standards in the production and processing segment. In particular, based on its revised cost analyses, the EPA exempted low production well sites from monitoring VOC fugitive emissions and changed the frequency of monitoring VOC fugitive emissions from quarterly to semiannually at gathering and boosting compressor stations. However, as a result of the CRA disapproval of the 2020 Policy Rule, the low production well sites and the gathering and boosting compressor stations continue to be subject to semiannual and quarterly monitoring of methane emissions respectively. While it is possible for these affected facilities to comply with both the VOC and methane monitoring standards that are now in effect, as compliance with the more stringent standard would be deemed compliance with the other, the EPA reviewed its decisions to amend the VOC monitoring frequencies for these affected facilities as well as the underlying record and, for the reasons explained below, no longer believe that the amendments are appropriate. Therefore, the EPA is proposing to repeal these amendments and restore the semiannual and quarterly monitoring requirements for low production well sites and gathering and boosting compressor stations, as originally promulgated in the 2016 NSPS OOOOa, for both methane and VOC.

1. Low Production Well Sites

As mentioned above, low production well sites are subject to semiannual monitoring of fugitive methane emissions. The EPA is proposing to repeal the amendment in the 2020

Technical Rule exempting low production well sites from monitoring fugitive VOC emissions because the analysis for the 2020 Technical Rule supports retaining the semiannual monitoring requirement when regulating both VOC and methane emissions. While the 2020 Technical Rule amended only the VOC standards in the production and processing segments, the EPA evaluated both methane and VOC reductions in its final technical support document (TSD) (2020 TSD), including the costs associated with different monitoring frequencies under the multipollutant approach,[175] which the EPA considers a reasonable approach when regulating multiple pollutants. As shown in the 2020 TSD, under the multipollutant approach, the cost of semiannual monitoring at low production well sites is $850 per ton of methane and $3,058 per ton of VOC reduced, both of which are well within the range of what the EPA considers to be cost effective.[176] Nevertheless, the EPA stated in the 2020 Technical Rule that "even if we had not rescinded the methane standards in the 2020 Policy Rule, we would still conclude that fugitive emissions monitoring, at any of the frequencies evaluated, is not cost effective for low production well sites." This statement, however, is inconsistent with the conclusions on what costs are reasonable for the control of methane emissions as discussed in this proposal in section IX. More importantly, as an initial matter, this statement was based on the EPA's observation in

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[175] For purposes of the multipollutant approach, we assume that emissions of methane and VOC are controlled at the same time, therefore, half of the cost is apportioned to the methane emission reductions and half of the cost is apportioned to VOC emission reductions.

[176] See 2020 NSPS OOOOa Technical Rule TSD at Docket ID No. EPA-HQ-OAR-2017-0483-2291. See also section IX, which provides that the cost effectiveness values for the controls that we have identified as BSER in this action range from $2,200/ton to $5,800/ton VOC reduction and $700/ton to $2,100/ton of methane reduction. As explained in that section, these controls reflect emission reduction technologies and methods that many owners and operators in the oil and gas industry have employed for years, either voluntarily or due to the 2012 and 2016 NSPS, as well as State or other requirements.

the 2020 Technical Rule that the $850 per ton of methane reduced is "greater than the highest value for methane that the EPA determined to be reasonable in the 2016 NSPS subpart OOOOa," which the EPA incorrectly identified as $738/ton; the record for the 2016 NSPS OOOOa shows that the EPA considered value as high as $2,185/ton to be cost effective for methane reduction. 80 FR 56627; see also, NSPS OOOOa Final TSD at 93, Table 6-7. Further, even with the incorrect observation, the EPA did not conclude in the 2020 Technical Rule that $850 per ton of methane reduced is therefore unreasonable. 85 FR 57420. In fact, the EPA reiterated its prior determination that "a cost of control of $738 per ton of methane reduced did not appear excessive," and that value was only $112 less than the value that the EPA had incorrectly identified as the highest methane cost-effectiveness value from the 2016 NSPS OOOOa. As discussed above, in fact $738/ton is well within the costs that the EPA concludes to be reasonable in the 2016 NSPS OOOOa as well as in this notice. Also, as explained in section XI.A.2, due to the wide variation in well characteristics, types of oil and gas products and production levels, gas composition, and types of equipment at well sites, there is considerable uncertainty regarding the relationship between the fugitive emissions and production levels. Accordingly, the EPA no longer believes that production levels provide an appropriate threshold for any exemption from fugitive monitoring. See section XI.A.2 for additional discussion on the proposed emission thresholds for well site fugitive emissions in place of production-based model plants. In light of the above, the EPA is proposing to remove the exemption of low production well sites from fugitive VOC emissions monitoring, thereby restoring the semiannual monitoring requirement established in the 2016 NSPS OOOOa.

2. Gathering and Boosting Compressor Stations

The EPA is proposing to repeal its amendment to the VOC monitoring frequency for gathering and boosting compressor stations in the 2020 Technical Rule because the EPA believes that amendment was made in error. In that rule, the EPA noted that, based on its revised cost analysis, quarterly monitoring has a cost effectiveness of $3,221/ton of VOC emissions and an incremental cost of $4,988/ton of additional VOC emissions reduced between the semiannual and quarterly monitoring frequencies. While the EPA observed that semiannual monitoring is more cost effective than quarterly, the EPA nevertheless acknowledged that "these values (total and incremental) are considered cost-effective for VOC reduction based on past EPA decisions, including the 2016 rulemaking." 85 FR 57421, September 15, 2020. The EPA instead identified two additional factors to support its decision to forgo quarterly monitoring. First, the EPA stated that the "Oil and Gas Industry is currently experiencing significant financial hardship that may weigh against the appropriateness of imposing the additional costs associated with more frequent monitoring." However, the EPA did not offer any data regarding the financial hardship, significant or otherwise, the industry was experiencing. While the rule cited to several articles on the impact of COVID-19 on the industry, the EPA did not discuss any aspect of any of the cited articles that led to its conclusion of "significant financial hardship" on the industry. Nor did the EPA explain how reducing the frequency of a monitoring requirement that had been in effect since 2016 would meaningfully affect the industry's economic circumstances in any way or weigh those considerations against the forgone emission reductions that would result from reducing monitoring frequency.

Second, the EPA generally asserted that "there are potential efficiencies, and potential cost savings, with applying the same monitoring frequencies for well sites and compressor

stations." Again, the EPA did not describe what the potential efficiencies are or the extent of cost savings that would justify forgoing quarterly monitoring, or weigh those efficiencies and cost savings against the forgone emission reductions that would result from reducing the monitoring frequency for compressor stations. Nor did we explain why the Agency's 2016 BSER determination that quarterly monitoring was achievable and cost-effective was incorrect in light of these asserted efficiencies. On the contrary, based on the compliance records for the 2016 NSPS OOOOa, there is no indication that compressor stations experienced hardship or difficulty in complying with the quarterly monitoring requirement. Further, as discussed in section XII.A.1.b, our analysis for NSPS OOOOb and EG OOOOc confirms that quarterly monitoring remains both achievable and cost-effective for compressor stations, and several State agencies also have rules that require quarterly monitoring at compressor stations. For the reasons stated above, the EPA concludes that it lacked justification and thus erred in revising the VOC monitoring frequency for gathering and boosting compressor stations from quarterly to semiannual. The EPA is therefore proposing to repeal that amendment, thereby restoring the quarterly monitoring requirement for gathering and boosting compressor stations, as established in the 2016 NSPS OOOOa.

B. Technical and Implementation Amendments

In the following sections, the EPA describes a series of proposed amendments to 2016 NSPS OOOOa for methane to align the 2016 methane standards with the current VOC standards (which were modified by the 2020 Technical Rule). We describe the supporting rationales that were provided in the 2020 Technical Rule for modifying the requirements applicable to the VOC standards, and explain why the amendments would also appropriately apply to the reinstated

methane standards.

1. Well Completions

In the 2020 Technical Rule, the EPA made certain amendments to the VOC standards for well completions in the 2016 NSPS OOOOa. For the same reasons provided in the 2020 Technical Rule and reiterated below, the EPA is proposing to apply the same amendments to the methane standards for well completions in the 2016 NSPS OOOOa.

First, the EPA is proposing to amend the 2016 NSPS OOOOa methane standards for well completions to allow the use of a separator at a nearby centralized facility or well pad that services the well affected facility during flowback, as long as the separator can be utilized as soon as it is technically feasible for the separator to function. The well completion requirements, as promulgated in 2016, had required that the owner or operator of a well affected facility have a separator on site during the entire flowback period. 81 FR 35901, June 3, 2016. In the 2020 Technical Rule, the EPA amended this provision to allow the separator to be at a nearby centralized facility or well pad that services the well affected facility during flowback as long as the separator can be utilized as soon as it is technically feasible for the separator to function. See 40 CFR 60.5375a(a)(1)(iii). As explained in that rulemaking (85 FR 57403) and previously in the 2016 NSPS OOOOa final rule preamble, "[w]e anticipate a subcategory 1 well to be producing or near other producing wells. We therefore anticipate reduced emission completion (REC) equipment (including separators) to be onsite or nearby, or that any separator brought onsite or nearby can be put to use." 81 FR 35852, June 3, 2016. For the same reason, the EPA is proposing to make the same amendment to the methane standards for well completions.

Additionally, the 2020 Technical Rule amended 40 CFR 60.5375a(a)(1)(i) to clarify that

the separator that is required during the initial flowback stage may be a production separator as long as it is also designed to accommodate flowback. As explained in the preamble to the final 2020 Technical Rule, when a production separator is used for both well completions and production, the production separator is connected at the onset of the flowback and stays on after flowback and at the startup of production. 85 FR 57403, September 15, 2020. For the same reason, the EPA is proposing the same clarification apply to the methane standards for well completions.

The 2020 Technical Rule also amended the definition of flowback. In 2016, the EPA defined "flowback" as follows:

> *Flowback* means the process of allowing fluids and entrained solids to flow from a well following a treatment, either in preparation for a subsequent phase of treatment or in preparation for cleanup and returning the well to production. The term flowback also means the fluids and entrained solids that emerge from a well during the flowback process. The flowback period begins when material introduced into the well during the treatment returns to the surface following hydraulic fracturing or refracturing. The flowback period ends when either the well is shut in and permanently disconnected from the flowback equipment or at the startup of production. The flowback period includes the initial flowback stage and the separation flowback stage.

81 FR 35934, June 3, 2016.

The 2020 Technical Rule amended this definition by adding a clarifying statement that "[s]creenouts, coil tubing cleanouts, and plug drill-outs are not considered part of the flowback process." 40 CFR 60.5430a. In the proposal for the 2020 Technical Rule, the EPA explained that

screenouts, coil tubing cleanouts, and plug drill outs are functional processes that allow for flowback to begin; as such, they are not part of the flowback. 83 FR 52082, October 15, 2018. In conjunction with this amendment, the 2020 Technical Rule added definitions for screenouts, coil tubing cleanouts, and plug drill outs. See 40 CFR 60.5430a. Specifically, a screenout is an attempt to clear proppant from the wellbore in order to dislodge the proppant out of the well. A coil tubing cleanout is a process where an operator runs a string of coil tubing to the packed proppant within a well and jets the well to dislodge the proppant and provide sufficient lift energy to flow it to the surface. A plug drill-out is the removal of a plug (or plugs) that was used to isolate different sections of the well. For the reason stated above, the EPA is proposing to apply the definitions of flowback, screenouts, coil tubing cleanouts, and plug drill outs that were finalized in the 2020 Technical Rule to the methane standards for well completions in the 2016 NSPS OOOOa.

Finally, the 2020 Technical Rule amended specific recordkeeping and reporting requirements for the VOC standards for well completions, and the EPA is proposing to apply these amendments to the methane standards for well completions in the 2016 NSPS OOOOa. For the reasons explained in 83 FR 52082, the 2020 Technical Rule requires that for each well site affected facility that routes flowback entirely through one or more production separators, owners and operators must record and report only the following data elements:

- Well Completion ID;
- Latitude and longitude of the well in decimal degrees to an accuracy and precision of five (5) decimals of a degree using North American Datum of 1983;
- U.S. Well ID;

- The date and time of the onset of flowback following hydraulic fracturing or refracturing or identification that the well immediately starts production; and
- The date and time of the startup of production.

While the 2020 Technical Rule removed certain reporting requirements (*e.g.,* information about when a separator is hooked up or disconnected during flowback) as unnecessary or redundant, 85 FR 57403, the rule added a requirement that for periods where salable gas is unable to be separated, owners and operators must record and report the date and time of onset of flowback, the duration and disposition of recovery, the duration of combustion and venting (if applicable), reasons for venting (if applicable), and deviations.

As explained in the preamble to the proposal for the 2020 Technical Rule, when a production separator is used for both well completions and production, the production separator is connected at the onset of the flowback and stays on after flowback and at the startup of production; in that event, certain reporting and recordkeeping requirements associated with well completions (*e.g.,* information about when a separator is hooked up or disconnected during flowback) would be unnecessary. 83 FR 52082. Because these amendments to the recordkeeping and reporting requirements associated with well completion are independent of the specific pollutant being regulated, we are proposing these same amendments to the methane standards for well completions in the 2016 NSPS OOOOa.

2. Pneumatic Pumps

In the 2020 Technical Rule, the EPA made certain amendments to the VOC standards for pneumatic pumps in the 2016 NSPS OOOOa. For the same reasons provided in the 2020 Technical Rule, along with further explanation provided below, the EPA is proposing to apply

the same amendments to the methane standards for pneumatic pumps in the 2016 NSPS OOOOa.

First, the EPA is proposing to amend the 2016 NSPS OOOOa methane standards for pneumatic pumps to expand the technical infeasibility provision to apply to pneumatic pumps at greenfield sites. Under the 2016 NSPS OOOOa, "emissions from new, modified, and reconstructed natural gas-driven diaphragm pumps located at well sites [must] be reduced by 95 percent if either a control device or the ability to route to a process is already available onsite, unless it is technically infeasible at sites other than new developments (*i.e.,* greenfield sites)." 81 FR 35824 and 35844. For the 2016 NSPS OOOOa, the EPA concluded that circumstances that could otherwise make control of a pneumatic pump technically infeasible at an existing location could be addressed in the design and construction of a greenfield site. 81 FR 35849 and 35850 (June 3, 2016). Concerns raised in petitions for reconsideration on the 2016 NSPS OOOOa explained that, even at greenfield sites, certain scenarios present circumstances where the control of a pneumatic pump may be technically infeasible despite the site being newly designed and constructed.[177] These circumstances include, but are not limited to, site designs requiring high-pressure flares to which routing a low-pressure pump discharge is not feasible and use of small boilers or process heaters that are insufficient to control pneumatic pump emissions or that could result in safety trips and burner flame instability. The EPA proposed to extend the technical infeasibility exemption to greenfield sites in 2018 and sought comment on these circumstances that could preclude control of a pneumatic pump at greenfield sites. While the EPA received comments both in favor of and opposing the application of the technical infeasibility exemption to greenfield sites, the commenters did not identify a reasoned basis for the EPA to decline to

[177] See proposal for 2020 Technical Rule at 83 FR 52061.

extend the exemption. See Response to Comments (RTC) for 2020 Technical Rule at 5-1 to 5-4 at Docket ID No. EPA-HQ-OAR-2017-0483. Moreover, the EPA specifically sought information regarding the additional costs that would be incurred if owners and operators of greenfield sites were required to select a control that can accommodate pneumatic pump emissions in addition to the control's primary purpose at a new construction site, but no such information was provided.

The 2020 Technical Rule therefore expanded the technical infeasibility provision to apply to pneumatic pumps at all well sites, including new developments (greenfield sites), concluding that the extension was appropriate because the EPA identified circumstances where it may not be technically feasible to control pneumatic pumps at a greenfield site. The 2020 Technical Rule removed the reference to greenfield site in 40 CFR 60.5393a(b) and the associated definition of greenfield site at 40 CFR 60.5430a.

In the final rule preamble for the 2016 NSPS OOOOa, the EPA stated we did not intend to require the installation of a control device at a well site for the sole purpose of controlling emissions from a pneumatic pump, but rather only required control of pneumatic pumps to the extent a control device or process would already be available on site. It is not the EPA's intent to require a greenfield site to install a control device specifically for controlling emissions from a pneumatic pump. It is our understanding that sites are designed to maximize operation and safety. This includes the placement of equipment, such as control devices. Because vented gas from pneumatic pumps is at low pressure, it may not be feasible to move collected gas through a closed vent system to a control device, depending on site design. Therefore, the EPA continues to conclude that, when determining technical feasibility at any site, such a determination should consider the routing of pneumatic pump emissions to the controls which are needed for the other

processes at the site (*i.e.,* not the pneumatic pump). The owner or operator must justify and provide professional or in-house engineering certification for any site where the control of pneumatic pump emissions is technically infeasible. As explained in the RTC for the 2020 Technical Rule, "[t]he EPA believes that the requirement to certify an engineering assessment to demonstrate technical infeasibility provides protection against an owner or operator purposely designing a new site just to avoid routing emissions from a pneumatic pump to an onsite control device or to a process."[178] For the reasons explained above, the EPA is proposing to align the methane standards in the 2016 NSPS OOOOa for controlling pneumatic pump emissions with the amendments made to the VOC standards in the 2020 Technical Rule to allow for a well-justified determination of technical infeasibility at all well sites, including greenfield sites.

Second, the 2020 Technical Rule amended the 2016 NSPS OOOOa to specify that boilers and process heaters are not considered control devices for the purposes of the pneumatic pump standards. It is the EPA's understanding, based on information provided in reconsideration petitions[179] submitted regarding the 2016 NSPS OOOOa and comments received on the proposal for the 2020 Technical Rule, that some boilers and process heaters located at well sites are not inherently designed for the control of emissions. While it is true that for some other sources (not pneumatic pumps), boilers and process heaters may be designed as control devices, that is

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[178] See Docket ID No. EPA-HQ-OAR-2017-0483-2291. "For example, consider the example provided by one commenter where a new site design requires only a high-pressure flare to control emergency and maintenance blowdowns and it is not feasible for a low-pressure pneumatic pump discharge to be routed to such a flare. The infeasibility determination would need not only demonstrate that it is not feasible for a low-pressure pneumatic pump discharge to be directly routed to the flare, it would also need to demonstrate that it is infeasible to design and install a low-pressure header to allow routing this discharge to such a flare system." RTC at 5-4.
[179] See Docket ID No. EPA-HQ-OAR-2017-0483-0016.

generally not the operational purpose of this equipment at a well site. Instead, it is the EPA's understanding that boilers and process heaters operate seasonally, episodically, or otherwise intermittently as process devices, thus making the use of these devices as controls inefficient and non-compliant with the continuous control requirements at 40 CFR 60.5415a.[180] Further, as explained in the 2020 Technical Rule, the fact that some boilers and process heaters located at well sites are not inherently designed to control emissions means that "routing pneumatic pump emissions to these devices may result in frequent safety trips and burner flame instability (*e.g.,* high temperature limit shutdowns and loss of flame signal)." *Id.* The EPA determined that "requiring the technical infeasibility evaluation for every boiler and process heater located at a wellsite would result in unnecessary administrative burden since each such evaluation would be raising the[se] same concerns." 85 FR 57404 (September 15, 2020). Further, as described above, the EPA did not intend to require the installation of a control device for the sole purpose of controlling emissions from pneumatic pumps. Based on the EPA's understanding that boilers and process heaters located at well sites are designed and operated as process equipment (meaning they are not inherently designed for the control of emissions), the EPA also does not intend to require their continuous operation solely to control emissions from pneumatic pumps either. Therefore, the EPA is proposing to align the methane standards for pneumatic pumps with the 2020 Technical Rule to specify that boilers and process heaters are not considered control devices for the purposes of controlling pneumatic pump emissions. The EPA solicits comment on this alignment, including whether there are specific examples where boilers and process heaters are currently used as control devices at well sites.

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[180] See Docket ID No. EPA-HQ-OAR-2017-0483-0016.

Third, the EPA is proposing to align the certification requirements for the determination that it is technically infeasible to route emissions from a pneumatic pump to a control device or process. The 2016 NSPS OOOOa required certification of technical infeasibility by a qualified third-party Professional Engineer (PE); however, the 2020 Technical Rule allows this certification by either a PE or an in-house engineer, because in-house engineers may be more knowledgeable about site design and control than a third-party PE. The EPA continues to believe that certification by an in-house engineer is appropriate for this purpose. We are, therefore, proposing to align the methane standards in the 2016 NSPS OOOOa with the 2020 Technical Rule to allow certification of technical infeasibility by either a PE or an in-house engineer with expertise on the design and operation of the pneumatic pump. We are soliciting comment on this proposed alignment.

3. Closed Vent Systems (CVS)

As in the 2020 Technical Rule, the EPA is proposing to allow multiple options for demonstrating that there are no detectable methane emissions from CVS. Additionally, the EPA is proposing to allow either a PE or an in-house engineer with expertise on the design and operation of the CVS to certify the design and operation will meet the requirement to route all vapors to the control device or back to the process.

The methane standards in the 2016 NSPS OOOOa require that CVS be operated with no detectable emissions, as demonstrated through specific monitoring requirements associated with the specific affected facilities (*i.e.,* pneumatic pumps, centrifugal compressors, reciprocating compressors, and storage vessels). Relevant here, the 2016 NSPS OOOOa required this demonstration for both VOC and methane emissions through annual inspections using EPA

Method 21 for CVS associated with pneumatic pumps, while requiring storage vessels to conduct monthly audio, visual, olfactory (AVO) monitoring. The 2020 Technical Rule amended the VOC requirements for CVS for pneumatic pumps to align the requirements for pneumatic pumps and storage vessels by incorporating provisions allowing the option to demonstrate the pneumatic pump CVS is operated with no detectable emissions by either an annual inspection using EPA Method 21, monthly AVO monitoring, or OGI monitoring at the frequencies specified for fugitive emissions monitoring. The EPA is proposing to amend the methane standards to allow pneumatic pump affected facilities to permit these same options to demonstrate no detectable methane emissions from CVS either using annual Method 21 monitoring, as currently required by the 2016 NSPS OOOOa, or using either monthly AVO monitoring or OGI monitoring at the fugitive monitoring frequency. The EPA considers these detection options appropriate for CVS associated with pneumatic pumps because any of the three would detect methane as well as VOC emissions. We incorporated the option for monthly AVO monitoring in the 2020 Technical Rule because pneumatic pumps and controlled storage vessels are commonly located at the same site and having separate monitoring requirements for a potentially shared CVS is overly burdensome and duplicative. 83 FR 52083 (October 15, 2018). We further incorporated the option for OGI monitoring because OGI is already being used for those sites that are subject to fugitive emissions monitoring and the CVS can readily be monitored during the fugitive emissions survey at no extra cost. 85 FR 57405. The EPA believes it is appropriate to maintain these options because not all well sites with controlled pneumatic pumps will be subject to fugitive emissions monitoring (*e.g.,* pneumatic pumps located at existing well sites that have not triggered the fugitive monitoring requirements for new or modified well sites) and requiring

either OGI or EPA Method 21 survey of the CVS for the pneumatic pump in the absence of fugitive emissions surveys would be unreasonable. It is possible for a new pneumatic pump to be subject to control at an existing well site that is not subject to the fugitive emissions requirements. Requiring either EPA Method 21 or OGI for the sole purpose of monitoring the CVS associated with the pneumatic pump would be too costly,[181] therefore we continue to believe monthly AVO is an appropriate option for pneumatic pumps subject to the 2016 NSPS OOOOa.

Additionally, the 2020 Technical Rule amended the 2016 NSPS OOOOa to allow certification of the design and operation of CVS by an in-house engineer with expertise on the design and operation of the CVS in lieu of a PE. This certification is necessary to ensure the design and operation of the CVS will meet the requirement to route all vapors to the control device or back to the process. As explained in the proposal for the 2020 Technical Rule, 83 FR 52079, the EPA allows CVS certification by either a PE or an in-house engineer because in-house engineers may be more knowledgeable about site design and control than a third-party PE. For the same reason, the EPA is proposing to amend the CVS requirements associated with methane emissions in the production and processing segments, and methane and VOC emissions in the transmission and storage segment, to allow certification of the design and operation of CVS by either a PE or an in-house engineer with expertise on the design and operation of the

[181] Both OGI and EPA Method 21 have significant capital and annual costs, including the cost of specialized equipment and trained operators of that equipment. While the costs of these programs are justified for well site fugitive emission monitoring based on the assumption of a high component count from which emissions would be controlled, the CVS is only one of those many components. Thus, where well site fugitive monitoring is not otherwise required, the cost-effectiveness of OGI or EPA Method 21 would be significantly higher for the CVS alone.

CVS.

4. Fugitive Emissions at Well Sites and Compressor Stations

a. Well Sites

The EPA is proposing to exclude from fugitive emissions monitoring a well site that is or later becomes a "wellhead only well site," which the 2020 Technical Rule defines as "a well site that contains one or more wellheads and no major production and processing equipment." The 2016 NSPS OOOOa excludes well sites that contain only one or more wellheads from the fugitive emissions requirements because fugitive emissions at such well sites are extremely low. 80 FR 56611. As explained in that rulemaking, "[s]ome well sites, especially in areas with very dry gas or where centralized gathering facilities are used, consist only of one or more wellheads, or 'Christmas trees,' and have no ancillary equipment such as storage vessels, closed vent systems, control devices, compressors, separators and pneumatic controllers. Because the magnitude of fugitive emissions depends on how many of each type of component (*e.g.,* valves, connectors, and pumps) are present, fugitive emissions from these well sites are extremely low." 80 FR 56611. The 2020 Technical Rule amended the 2016 NSPS OOOOa to exclude from fugitive emissions monitoring a well site that is or later becomes a "wellhead only well site," which the 2020 Technical Rule defines as "a well site that contains one or more wellheads and no major production and processing equipment." The 2020 Technical Rule defined "major production and processing equipment" as including reciprocating or centrifugal compressors, glycol dehydrators, heater/treaters, separators, and storage vessels collecting crude oil, condensate, intermediate hydrocarbon liquids, or produced water. We continue to believe that

available information, including various studies,[182] supports an exemption for well sites that do not have this major production and processing equipment. The 2020 Technical Rule allows certain small ancillary equipment, such as chemical injection pumps, pneumatic controllers used to control well emergency shutdown valves, and pumpjacks, that are associated with, or attached to, the wellhead and "Christmas tree" to remain at a "wellhead only well site" without being subject to the fugitive emissions monitoring requirements because they have very few fugitive emissions components that would leak, and therefore have limited potential for fugitive emissions. The emission reduction benefits of continuing monitoring at that point would be relatively low, and thus would not be cost-effective.

For the reason stated above, the EPA is proposing to amend the 2016 NSPS OOOOa to allow monitoring of methane fugitive emissions to stop when a wellsite contains only wellhead(s) and no major production and processing equipment, as provided in the 2020 Technical Rule.

b. Compressor Stations

As discussed above, the 2016 NSPS OOOOa required quarterly monitoring of compressor stations for both VOC and methane emissions, and it also permitted waiver from one quarterly monitoring event when the average temperature is below 0° F for two consecutive months because it is technically infeasible for the OGI camera (and EPA Method 21 instruments) to operate below this temperature. After the 2020 Policy Rule rescinded the methane standards, the 2020 Technical Rule reduced the monitoring requirements for the VOC standards to require

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[182] See *https://pubs.acs.org/doi/10.1021/acs.est.0c02927, https://data.permianmap.org/pages/flaring,* and *https://www.edf.org/sites/default/files/documents/PermianMapMethodology_1.pdf.*

only semiannual monitoring and, in doing so, removed the waiver. Upon enactment of the CRA resolution, compressor stations again became subject to quarterly monitoring pursuant to the reinstated 2016 NSPS OOOOa methane standards, and the waiver as it applied to the methane standards was also reinstated. Consistent with our proposal to align the monitoring requirements for VOCs with the monitoring requirements for methane, the EPA is also proposing to reinstate the waiver for the VOC standards as specified in the 2016 NSPS OOOOa.

c. Well Sites and Compressor Stations on the Alaska North Slope

The EPA is proposing to amend the 2016 NSPS OOOOa to require that new, reconstructed, and modified compressor stations located on the Alaska North Slope that startup (initially, or after reconstruction or modification) between September and March to conduct initial monitoring of methane emissions within 6 months of startup, or by June 30, whichever is later. The EPA made a similar amendment to the initial monitoring of methane and VOC emissions at well sites located on the Alaska North Slope in the March 12, 2018 amendments to the 2016 NSPS OOOOa ("2018 NSPS OOOOa Rule").[183] As explained in that action, such separate requirements were warranted due to the area's extreme cold temperatures, which for approximately half of the year are below the temperatures at which the monitoring instruments are designed to operate. The 2020 Technical Rule made this amendment for VOC emissions from gathering and boosting compressor stations located in the Alaska North Slope for this same reason.

The EPA is also proposing to amend the 2016 NSPS OOOOa to require annual monitoring of methane and VOC emissions at all compressor stations located on the Alaska

[183] 83 FR 10628 (March 12, 2018).

North Slope, with subsequent annual monitoring at least 9 months apart but no more than 13 months apart. In the 2018 NSPS OOOOa Rule, the EPA similarly amended the monitoring frequency for well sites located on the Alaska North Slope to annual monitoring to accommodate the extreme cold temperature. 83 FR 10628 (March 12, 2018). For the same reason, in the 2020 Technical Rule, the EPA amended the 2016 NSPS OOOOa to require annual VOC monitoring at gathering and boosting compressor stations located on the Alaska North Slope because extreme cold temperatures make it technically infeasible to conduct OGI monitoring for over half of a year.[184] Because the same difficulties would arise with respect to monitoring for fugitive methane emissions from gathering and boosting compressor stations or to monitoring of methane and VOC emissions from compressor stations in the transmission and storage segment, the EPA is proposing to amend the 2016 NSPS OOOOa to require that all compressor stations located on the Alaska North Slope conduct annual monitoring of both methane and VOC emissions.

Further, the EPA is proposing to extend the deadline for conducting initial monitoring of both VOC and methane emissions from 60 days to 90 days for all well sites and compressor stations located on the Alaska North Slope that startup or are modified between April and August. In the 2020 Technical Rule, the EPA made this amendment for initial VOC monitoring to allow the well site or gathering and boosting compressor station to reach normal operating conditions. 85 FR 57406. For the same reason, we are proposing to further amend the 2016 NSPS OOOOa to apply this same 90-day initial monitoring requirement to initial monitoring of

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[184] See Docket ID Nos. EPA-HQ-OAR-2010-0505-7682 and EPA-HQ-OAR-2010-0505-12434. See also FLIR Systems, Inc. product specifications for GF300/320 model OGI cameras at *http://www.flir.com/ogi/display/?id=55671* and Thermo Fisher Scientific product specification for TVA-2020 at *https://assets.thermofisher.com/TFS-Assets/LSG/Specification-Sheets/EPM-TVA2020.pdf.*

fugitive methane and VOC emissions from all well sites and compressor stations located on the Alaska North Slope that startup or are modified between April and August.

d. Modification

The 2016 NSPS OOOOa, as originally promulgated, provided that "[f]or purposes of the fugitive emissions standards at 40 CFR 60.5397a, [a] well site also means a separate tank battery surface site collecting crude oil, condensate, intermediate hydrocarbon liquids, or produced water from wells not located at the well site (*e.g.,* centralized tank batteries)." 40 CFR 60.5430a. However, the original 2016 NSPS OOOOa defined "modification" only with respect to a well site and was silent on what constitutes modification to a well site that is a separate tank battery surface site. Specifically, 40 CFR 60.5365a(i), as promulgated in 2016, specified that, for the purposes of fugitive emissions components at a well site, a modification occurs when (1) a new well is drilled at an existing well site, (2) a well is hydraulically fractured at an existing well site, or (3) a well is hydraulically refractured at an existing well site. See 40 CFR 60.5365a(i).

Because this provision was silent on when modification occurs at a well site that is a separate tank battery surface site, the 2020 Technical Rule added language to clarify that a modification of a well site that is a separate tank battery surface site occurs when (1) any of the actions listed above for well sites occurs at an existing separate tank battery surface site, (2) a well modified as described above sends production to an existing separate tank battery surface site, or (3) a well site subject to the fugitive emissions requirements removes all major production and processing equipment such that it becomes a wellhead-only well site and sends production to an existing separate tank battery surface site. Because the 2020 Technical Rule amended only the VOC standards in the 2016 NSPS OOOOa, and since this definition of

modification equally applies to fugitive methane emissions from a separate tank battery surface site, the EPA is proposing to apply this definition of modification for purposes of determining when modification occurs at a separate tank battery surface site triggering the methane standards for fugitive emissions at well sites.

e. Initial Monitoring for Well Sites and Compressor Stations

The 2016 NSPS OOOOa, as originally promulgated, had required monitoring of methane and VOC fugitive emissions at well sites and compressor stations to begin within 60 days of startup (of production in the case of well sites) or modification. The 2020 Technical Rule extended this time frame to 90 days for well sites and gathering and boosting compressor stations in response to comments stating that well sites and compressor stations do not achieve normal operating conditions within the first 60 days of startup and suggesting that the EPA allow 90 days to 180 days. The EPA agreed that additional time to allow the well site or compressor station to reach normal operating conditions is warranted, considering the purpose of the initial monitoring is to identify any issues associated with installation and startup of the well site or compressor station. By providing sufficient time to allow owners and operators to conduct the initial monitoring survey during normal operating conditions, the EPA expects that there will be more opportunity to identify and repair sources of fugitive emissions, whereas a partially operating site may result in missed emissions that remain unrepaired for a longer period of time. 85 FR 57406. These same reasons apply regardless of pollutant or the location of the compressor station; therefore, the EPA is proposing to further amend the 2016 NSPS OOOOa to extend the deadline for conducting initial monitoring from 60 to 90 days for monitoring both VOC and methane fugitive emissions at all well sites and compressor stations (except those on the Alaska

North Slope which are separately regulated as discussed in section X.B.4.c).

f. Repair Requirements

The 2020 Technical Rule made certain amendments to the 2016 NSPS OOOOa repair requirements associated with monitoring of fugitive VOC emissions at well sites and gathering and boosting compressor stations. For the same reasons provided in the 2020 Technical Rule and reiterated below, the EPA is proposing to similarly amend the 2016 NSPS OOOOa repair requirements associated with monitoring of methane emissions at well sites and gathering and boosting compressor stations and monitoring of VOC and methane fugitive emissions at compressor stations in the transmission and storage segment.

Specifically, the EPA is proposing to require a first attempt at repair within 30 days of identifying fugitive emissions and final repair, including the resurvey to verify repair, within 30 days of the first attempt at repair. The 2016 NSPS OOOOa, as originally promulgated, required repair within 30 days of identifying fugitive emissions and a resurvey to verify that the repair was successful within 30 days of the repair. Stakeholders raised questions regarding whether emissions identified during the resurvey would result in noncompliance with the repair requirement. In the 2020 Technical Rule, the EPA clarified that repairs should be verified as successful prior to the repair deadline and added definitions for the terms "first attempt at repair" and "repaired." Specifically, the definition of "repaired" includes the verification of successful repair through a resurvey of the fugitive emissions component. The EPA is similarly proposing to apply these amendments to the repair requirements made in the 2020 Technical Rule to the repair requirements associated with monitoring of methane emissions at well sites and gathering and boosting compressor stations as well as monitoring of VOC and methane fugitive emissions

at compressor stations in the transmission and storage segment and monitoring.

In addition, the EPA is proposing that delayed repairs be completed during the "next scheduled compressor station shutdown for maintenance, scheduled well shutdown, scheduled well shut-in, after a scheduled vent blowdown, or within 2 years, whichever is earliest." The proposed amendment would clarify that completion of delayed repairs is required during scheduled shutdown for maintenance, and not just any shutdown.

In 2018 NSPS OOOOa Rule the EPA amended the 2016 NSPS OOOOa to specify that, where the repair of a fugitive emissions component is "technically infeasible, would require a vent blowdown, a compressor station shutdown, a well shutdown or well shut-in, or would be unsafe to repair during operation of the unit, the repair must be completed during the next scheduled compressor station shutdown, well shutdown, well shut-in, after a planned vent blowdown, or within 2 years, whichever is earlier."[185] During the rulemaking for the 2020 Technical Rule, the EPA received comments expressing concerns with requiring repairs during the next scheduled compressor station shutdown, without regard to whether the shutdown is for maintenance purposes. The commenters stated that repairs must be scheduled and that where a planned shutdown is for reasons other than scheduled maintenance, completion of the repairs during that shutdown may be difficult and disrupt gas transmission. The EPA agrees that requiring the completion of delayed repairs only during those scheduled compressor station shutdowns where maintenance activities are scheduled is reasonable and anticipates that these maintenance shutdowns occur on a regular schedule. Accordingly, in the 2020 Technical Rule the EPA further amended this provision by adding the term "for maintenance" to clarify that

[185] 83 FR 10638, 40 CFR 60.5397a(h)(2).

repair must be completed during the "next scheduled compressor station shutdown for maintenance" or other specified scheduled events, or within 2 years, whichever is the earliest. For the same reason, the EPA is proposing the same clarifying amendment to the delay of repair requirements for fugitive methane emissions at well sites and gathering and boosting compressor stations and fugitive VOC and methane fugitive emissions at compressor stations in the transmission and storage segment.

g. Definitions Related to Fugitive Emissions at Well Sites and Compressor Stations

The 2020 Technical Rule made certain amendments to the definition of a well site and the definition for startup of production as they relate to fugitive VOC emissions requirements at well sites. For the same reasons provided in the 2020 Technical Rule and reiterated below, the EPA is proposing to similarly amend these definitions as they relate to the fugitive methane emissions requirements at well sites.

The 2020 Technical Rule amended the definition of well site, for purposes of VOC fugitive emissions monitoring, to exclude equipment owned by third parties and oilfield solid waste and wastewater disposal wells. The amended definition for "well site" excludes third party equipment from the fugitive emissions requirements by excluding "the flange immediately upstream of the custody meter assembly and equipment, including fugitive emissions components located downstream of this flange." To clarify this exclusion, the 2020 Technical Rule defines "custody meter" as "the meter where natural gas or hydrocarbon liquids are measured for sales, transfers, and/or royalty determination," and the "custody meter assembly" as "an assembly of fugitive emissions components, including the custody meter, valves, flanges, and connectors necessary for the proper operation of the custody meter." This exclusion was

added for several reasons, including consideration that owners and operators may not have access or authority to repair this third-party equipment and because the custody meter "is used effectively as the cash register for the well site and provides a clear separation for the equipment associated with production of the well site, and the equipment associated with putting the gas into the gas gathering system." 83 FR 52077 (October 15, 2018).

The definition of a well site was also amended in the 2020 Technical Rule to exclude Underground Injection Control (UIC) Class I oilfield disposal wells and UIC Class II oilfield wastewater disposal wells. The EPA had proposed to exclude UIC Class II oilfield wastewater disposal wells because of our understanding that they have negligible fugitive VOC and methane emissions. 83 FR 52077. Comments received on the 2020 Technical rulemaking effort further suggested, and the EPA agreed, that we also should exclude UIC Class I oilfield disposal wells because of their low VOC and methane emissions. Both types of disposal wells are permitted through UIC programs under the Safe Drinking Water Act for protection of underground sources of drinking water. For consistency, the 2020 Technical Rule adopted the definitions for UIC Class I oil field disposal wells and UIC Class II oilfield wastewater disposal wells under the Safe Drinking Water Act definitions in excluding them from the definition of a well site in the 2016 NSPS OOOOa. Specifically, the 2020 Technical Rule defined a UIC Class I oilfield disposal well as "a well with a UIC Class I permit that meets the definition in 40 CFR 144.6(a)(2) and receives eligible fluids from oil and natural gas exploration and production operations." Additionally, the 2020 Technical Rule defines a UIC Class II oilfield wastewater disposal well as "a well with a UIC Class II permit where wastewater resulting from oil and natural gas production operations is injected into underground porous rock formations not productive of oil

or gas, and sealed above and below by unbroken, impermeable strata." As amended, UIC Class I and UIC Class II disposal wells are not considered well sites for the purposes of VOC fugitive emissions requirements. Because the 2020 Technical Rule, as finalized, addressed only VOC emissions in the production and processing segment, the EPA is proposing the same exclusion and definition of "well site" for the purposes of fugitive emissions monitoring of methane emissions at well sites.

The EPA is also proposing to apply the definition for "startup of production" for purposes of well site fugitive emissions requirements for VOC to these requirements as they relate to methane. The 2016 NSPS OOOOa initially contained a definition for "startup of production" as it relates to the well completion standards that reduce emissions from hydraulically fractured wells. For that purpose, the term was defined as "the beginning of initial flow following the end of flowback when there is continuous recovery of salable quality gas and separation and recovery of any crude oil, condensate or produced water." 81 FR 25936 (June 3, 2016). The 2020 Technical Rule amended the definition of "startup of production" to separately define the term as it relates to fugitive VOC emissions requirements at well sites. Specifically, "…[f]or the purposes of the fugitive monitoring requirements of 40 CFR 60.5397a, *startup of production* means the beginning of the continuous recovery of salable quality gas and separation and recovery of any crude oil, condensate or produced water" 85 FR 57459 (September 15, 2020). This separate definition clarifies that fugitive emissions monitoring applies to both conventional and unconventional (hydraulically fractured) wells. For this same reason, the EPA is proposing to apply this same definition of "startup of production" to fugitive emissions monitoring of methane emissions at well sites.

h. Monitoring Plan

The 2016 NSPS OOOOa, as originally promulgated, required that each fugitive emissions monitoring plan include a site map and a defined observation path to ensure that the OGI operator visualizes all of the components that must be monitored during each survey. The 2020 Technical Rule amended this requirement to allow the company to specify procedures that would meet this same goal of ensuring every component is monitored during each survey. While the site map and observation path are one way to achieve this, other options can also ensure monitoring, such as an inventory or narrative of the location of each fugitive emissions component. The EPA stated in the 2020 Technical Rule that "these company-defined procedures are consistent with other requirements for procedures in the monitoring plan, such as the requirement for procedures for determining the maximum viewing distance and maintaining this viewing distance during a survey." 85 FR 57416 (September 15, 2020). Because the same monitoring device is used to monitor both methane and VOC emissions, the same company-defined procedures for ensuring each component is monitored are appropriate. Therefore, the EPA is proposing to similarly amend the monitoring plan requirements for methane and for compressor stations to allow company procedures in lieu of a sitemap and an observation path.

i. Recordkeeping and Reporting

The 2020 Technical Rule amended the 2016 NSPS OOOOa to streamline the recordkeeping and reporting requirements for the VOC fugitive emissions standards. The amendments removed the requirement to report or keep certain records that the EPA determined were redundant or unnecessary; in some instances, the rule replaced those requirements or added new requirements that could better demonstrate and ensure compliance, in particular where the

underlying requirement was also amended (*e.g.,* repair requirements). These amendments reflect consideration of the public comments received on the proposal for that rulemaking. The purpose and function of the recordkeeping and reporting requirements are equally applicable to methane and VOCs, and therefore, are not pollutant specific. For the same reasons the EPA streamlined these requirements in the 2020 Technical Rule,[186]the EPA is proposing to apply these streamlined recordkeeping and reporting requirements for methane emissions from sources subject to NSPS OOOOa.

For each collection of fugitive emissions components located at a well site or compressor station, the following amendments were made to the recordkeeping and reporting requirements in the 2020 Technical Rule:

- Revised the requirements in 40 CFR 60.5397a(d)(1) to require inclusion of procedures that ensure all fugitive emissions components are monitored during each survey within the monitoring plan.
- Removed the requirement to maintain records of a digital photo of each monitoring survey performed, captured from the OGI instrument used for monitoring when leaks are identified during the survey because the records of the leaks provide proof of the survey taking place.
- Removed the requirement to maintain records of the number and type of fugitive emissions components or digital photo of fugitive emissions components that are not repaired during the monitoring survey once repair is completed and verified with a resurvey.

[186] See 85 FR 57415 (September 15, 2020).

- Required records of the date of first attempt at repair and date of successful repair.
- Revised reporting to specify the type of site (*i.e.,* well site or compressor station) and when the well site changes status to a wellhead-only well site.
- Removed requirement to report the name or ID of operator performing the monitoring survey.
- Removed requirement to report the number and type of difficult-to-monitor and unsafe-to-monitor components that are monitored during each monitoring survey.
- Removed requirement to report the ambient temperature, sky conditions, and maximum wind speed.
- Removed requirement to report the date of successful repair.
- Removed requirement to report the type of instrument used for resurvey.

5. AMEL

The 2020 Technical Rule made the following amendments to the provisions associated with applications for use of an AMEL for VOC work practice standards for well completions, reciprocating compressors, and the collection of fugitive emissions components located at well sites and gathering and boosting compressor stations. For the same reasons provided in the 2020 Technical Rule and reiterated below, the EPA is proposing to similarly amend the 2016 NSPS OOOOa provisions associated with applications for use of an AMEL for methane work practice standards at well sites and gathering and boosting compressor stations and VOC and methane work practice standards at compressor stations in the transmission and storage segment.

The 2020 Technical Rule amended the AMEL application requirements to help streamline the process for evaluation and possible approval of advanced measurement

technologies. The amendments included allowing submission of applications by, among others, owners and operators of affected facilities, manufacturers or vendors of leak detection technologies, or trade associations. The 2020 Technical Rule "allows any person to submit an application for an AMEL under this provision." 85 FR 57422 (September 15, 2020). However, the 2020 Technical Rule, like the 2016 NSPS OOOOa still requires that the application include sufficient information to demonstrate that the AMEL achieves emission reductions at least equivalent to the work practice standards in the rule. To that end, the 2020 Technical Rule "requires applications for these AMEL to include site-specific information to demonstrate equivalent emissions reductions, as well as site-specific procedures for ensuring continuous compliance." *Id.* At a minimum, the application should include field data that encompass seasonal variations, which may be supplemented with modeling analyses, test data, and/or other documentation. The specific work practice(s), including performance methods, quality assurance, the threshold that triggers action, and the mitigation thresholds are also required as part of the AMEL application. For example, for a technology designed to detect fugitive emissions, information such as the detection criteria that indicate fugitive emissions requiring repair, the time to complete repairs, and any methods used to verify successful repair would be required.

Since the 2020 Technical Rule changes to the AMEL provisions in the 2016 NSPS OOOOa are procedural in the sense that they mostly speak to the "minimum information that must be included in each application in order for the EPA to make a determination of equivalency and, thus, be able to approve an alternative" the EPA believes that it is appropriate to retain those amendments. 85 FR 57422 (September 15, 2020). If finalized, the application

must demonstrate equivalence as explained above for both the reduction of methane and VOC emissions. Because the 2020 Technical Rule amended only the VOC standards in the 2016 NSPS OOOOa, and since EPA believes that basis for promulgation of this provision for AMEL applications equally applies to work practices standards for methane emissions at facilities in the production and processing segments and VOC and methane emissions at facilities in the transmission and storage segment, the EPA is proposing to apply these application requirements for all applicants seeking an AMEL for the methane and VOC work practice standards in NSPS OOOOa.

6. Alternative Fugitive Emissions Standards based on Equivalent State Programs

The 2020 Technical Rule added a new section (at 40 CFR 60.5399a) which served two purposes. First, the new section outlined procedures for State, local, and Tribal authorities to seek the EPA's approval of their VOC fugitive emissions standards at well sites and gathering and boosting compressor stations as an alternative to the Federal standards. Second, the new section approved specific voluntary alternative standards for six States. For the same reasons provided in the 2020 Technical Rule and reiterated below, the EPA is proposing to similarly allow this new section to apply to fugitive emissions standards for methane fugitive emissions at well sites and gathering and boosting compressor stations, and VOC and methane fugitive emissions at compressor stations in the transmission and storage segment.

The 2020 Technical Rule added this new section in part to allow the use of specific alternative fugitive emissions standards for VOC emissions for six State fugitive emissions programs that the EPA had concluded were at least equivalent to the fugitive emissions monitoring and repair requirements at 40 CFR 60.5397a(e), (f), (g), and (h) as amended in that

rule.[187] These approved alternative fugitive emissions standards may be used for certain individual well sites or gathering and boosting compressor stations that are subject to VOC fugitive emissions monitoring and repair so long as the source complies with specified Federal requirements applicable to each approved alternative State program and included in 40 CFR 60.5399a(f) through (n). For example, a well site that is subject to the requirements of Pennsylvania General Permit 5A, section G, effective August 8, 2018, could choose to comply with those standards in lieu of the monitoring, repair, recordkeeping, and reporting requirements in the NSPS for fugitive emissions at well sites. However, in that example, the owner or operator must develop and maintain a fugitive emissions monitoring plan, as required in 40 CFR 60.5397a(c) and (d), and must monitor all of the fugitive emissions components, as defined in 40 CFR 60.5430a, regardless of the components that must be monitored under the alternative standard (*i.e.*, under Pennsylvania General Permit 5A, Section G in the example). Additionally, the facility choosing to use the EPA-approved alternative standard must submit, as an attachment to its annual report for NSPS OOOOa, the report that is submitted to its State in the format submitted to the State, or the information required in the report for NSPS OOOOa if the State report does not include site-level monitoring and repair information. If a well site is located in the State but is not subject to the State requirements for monitoring and repair (*i.e.,* not obligated to monitor or repair fugitive emissions), then the well site must continue to comply with the Federal requirements of the NSPS at 40 CFR 60.5397a in its entirety.

In addition to providing the EPA-approved voluntary alternative fugitive emissions

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[187] See memorandum, *"Equivalency of State Fugitive Emissions Programs for Well Sites and Compressor Stations to Final Standards at 40 CFR part 60, subpart OOOOa,"* located at Docket ID No. EPA-HQ-OAR-2017-0483. January 17, 2020.

standards for well sites and gathering and boosting compressor stations located in California, Colorado, Ohio, Pennsylvania, and Texas, and well sites in Utah, the amendments in the 2020 Technical Rule provide application requirements to request the EPA approval of an alternative fugitive emissions standards as State, local, and Tribal programs continue to develop. Applications for the EPA approval of alternative fugitive emissions standards based on State, local, or Tribal programs may be submitted by any interested person, including individuals, corporations, partnerships, associations, States, or municipalities. Similar to the application process for AMEL for advanced measurement technologies, the application must include sufficient information to demonstrate that the alternative fugitive emissions standards achieve emissions reductions at least equivalent to the fugitive emissions monitoring and repair requirements in the Federal NSPS. At a minimum, the application must include the monitoring instrument, monitoring procedures, monitoring frequency, definition of fugitive emissions requiring repair, repair requirements, recordkeeping, and reporting requirements. If any of the sections of the State regulations or permits approved as alternative fugitive emissions standards are changed at a later date, the State must follow the procedures outlined in 40 CFR 60.5399a to apply for a new evaluation of equivalency.

As part of the 2018 proposed rule that resulted in the 2020 Technical Rule, the EPA evaluated the specific State programs for both methane and VOC emissions at well sites, gathering and boosting compressor stations, and compressor stations in the transmission and storage segment as discussed in detail in a memorandum to that docket evaluating the equivalency of State fugitive emissions programs.[188] The EPA is now proposing that all well

[188] See Docket ID Nos. EPA-HQ-OAR-2017-0483-0041 and EPA-HQ-OAR-2017-0483-2277.

sites and compressor stations located in and subject to the specified State regulations in 40 CFR 60.5399a may utilize these alternative fugitive emissions standards for both methane and VOC fugitive emissions. In the 2020 Technical Rule the EPA concluded that these monitoring, repair, recordkeeping, and reporting requirements were equivalent to the same types of requirements in the 2016 NSPS OOOOa for VOC at well sites and gathering and boosting compressor stations. See 85 FR 57424. The monitoring instrument (*i.e.,* OGI or EPA Method 21) will detect, at the same time, both methane and VOC emissions without speciating these emissions. Therefore, detection of one of these pollutants is also detection of the other pollutant. For the same reasons provided in the 2020 Technical Rule, and explained in the associated State equivalency memos, the EPA proposes to find these same State fugitive emissions standards (as specified in 40 CFR 60.5399a (f) through (n)) equivalent to the specified Federal methane fugitive emissions standards for well sites and gathering and boosting stations, and the methane and VOC fugitive emissions standards for compressor stations in the transmission and storage segment. The EPA is also proposing to allow State, local, and Tribal agencies to apply for the EPA approval of their fugitives monitoring program as an alternative to the Federal NSPS for methane. Put another way, the EPA is proposing to include methane throughout 40 CFR 40 CFR 60.5399a.

The EPA recognizes that the determinations of equivalence included in the 2020 Technical Rule were based on the fugitive emissions monitoring requirements that existed at that time for the 2016 NSPS OOOOa which, based on other changes in the 2020 Technical Rule, included an exemption from monitoring for low production well sites and required semiannual monitoring at gathering and boosting compressor stations. As explained above, the EPA is proposing to repeal both of those changes, and require semiannual monitoring at all well sites,

including those with low production, and quarterly monitoring at gathering and boosting compressor stations. These proposed changes to the 2016 NSPS OOOOa fugitive emissions requirements do not impact the EPA's conclusion that the six previously approved alternative State programs are equivalent to the Federal standards. Even so, the EPA is proposing regulatory changes within the alternative State program provisions in 2016 NSPS OOOOa to account for these proposed changes to the Federal standards. See the redline version of regulatory text in the docket at Docket ID No. EPA-HQ-OAR-2021-0317. These changes are intended to ensure that the previously approved alternative State programs continue to maintain equivalency with the Federal standards if NSPS OOOOa is revised as proposed here. With these changes, the EPA continues to find that the alternative State programs that were previously approved are still equivalent with, if not better than, the Federal requirements.

7. Onshore Natural Gas Processing Plants

a. Capital Expenditure

The 2020 Technical Rule made certain amendments to the 2016 NSPS OOOOa definition of capital expenditure as it relates to modifications for VOC LDAR requirements at onshore natural gas processing plants. For the same reasons provided in the 2020 Technical Rule and reiterated below, the EPA is proposing to similarly amend this definition as it relates to the methane LDAR requirements at onshore natural gas processing plants.

The 2020 Technical Rule amended the definition of "capital expenditure" at 40 CFR 50.5430a by replacing the equation used to determine the percent of replacement cost, "Y." This amendment was necessary because, as originally promulgated, the equation for determining "Y" would result in an error, thus, making it difficult to determine whether a capital expenditure had

occurred using the NSPS OOOOa equation. The 2020 Technical Rule replaced the equation with an equation that utilizes the consumer price indices, "CPI" because it more appropriately reflects inflation than the original equation. Specifically, the equation for "Y" as amended in the 2020 Technical Rule, is based on the CPI, where "Y" equals the CPI of the date of construction divided by the most recently available CPI of the date of the project, or "CPI_N/CPI_{PD}." Further, the 2020 Technical Rule specifies that the "annual average of the CPI for all urban consumers (CPI-U), U.S. city average, all items" must be used for determining the CPI of the year of construction, and the "CPI-U, U.S. city average, all items" must be used for determining the CPI of the date of the project. This amendment clarified that the comparison of costs is between the original date of construction of the process unit (the affected facility) and the date of the project which adds equipment to the process unit. For these same reasons, the EPA is proposing that the definition of "capital expenditure," as amended by the 2020 Technical Rule, also be used to determine whether modification had occurred and thus triggers the applicability of the methane LDAR requirements at onshore natural gas processing plants in the 2016 NSPS OOOOa.

b. Initial Compliance Period

The 2020 Technical Rule amended the VOC standards for onshore natural gas processing plants to specify that the initial compliance deadline for the equipment leak standards is 180 days. The EPA is proposing to apply this clarification to the initial compliance deadline with the methane standards for equipment leaks at onshore natural gas processing plants.

As explained in the 2020 Technical Rule, the EPA added a provision requiring compliance "as soon as practicable, but no later than 180 days after initial startup" because that provision was in the NSPS for equipment leaks of VOC at onshore natural gas processing plants

when it was first promulgated, specifically at 40 CFR 60.632(a) of part 60, subpart KKK (NSPS KKK). 85 FR 57408. This provision at 40 CFR 60.632(a) provides up to 180 days to come into compliance with NSPS KKK. In 2012, the EPA revised the standards in NSPS KKK with the promulgation of NSPS OOOO[189]by lowering the leak definition for valves from 10,000 ppm to 500 ppm and requiring the monitoring of connectors. 77 FR 49490, 49498. While the EPA did not mention that it was also amending the 180-day compliance deadline in NSPS OOOO, this provision at 40 CFR 60.632(a) was not included in NSPS OOOO and, in turn, was not included in NSPS OOOOa. During the rulemaking for NSPS OOOOa, the EPA declined a request to include this provision at 40 CFR 60.632(a) in NSPS OOOOa, explaining that such inclusion was not necessary because NSPS OOOOa already incorporates by reference a similar provision (*i.e.,* 40 CFR 60.482-1a(a)) which requires each owner or operator to "demonstrate compliance …within 180 days of initial startup," 80 FR 56593, 56647-8. However, in reassessing the issue during the rulemaking for the 2020 Technical Rule, the EPA noted that NSPS KKK includes both the provision in 40 CFR 60.632(a) and 40 CFR 60.482-1(a), which contains a provision that is the same as the one described above at 40 CFR 60.482-1a(a), thus suggesting that 40 CFR 60.632(a) is not redundant or unnecessary. In fact, the absence of this provision in NSPS OOOO/OOOOa raised a question as to whether compliance is required within 30 days for equipment that is required to be monitored monthly. To clarify this confusion and remain consistent with NSPS KKK, the 2020 Technical Rule amended NSPS OOOOa to reinstate this provision at 40 CFR 60.632(a). For the same reasons explained above, the EPA is proposing to

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[189] *"Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for Which Construction, Modification or Reconstruction Commenced After August 23, 2011, and on or before September 18, 2015."*

similarly apply this provision to compliance with methane standards for the equipment leaks at onshore natural gas processing plants.

This provision clarifies that monitoring must begin as soon as practicable, but no later than 180 days after the initial startup of a new, modified, or reconstructed process unit at an onshore natural gas processing plant. Once started, monitoring must continue with the required schedule. For example, if pumps are monitored by month 3 of the initial startup period, then monthly monitoring is required from that point forward. This initial compliance period is different than the compliance requirements for newly added pumps and valves within a process unit that is already subject to a LDAR program. Initial monitoring for those newly added pumps and valves is required within 30 days of the startup of the pump or valve (*i.e.,* when the equipment is first in VOC service).

8. Technical Corrections and Clarifications

The 2020 Technical Rule also revised the 2016 NSPS OOOOa for VOC emissions to include certain additional technical corrections and clarifications. In this action, the EPA is proposing to apply these same technical corrections and clarifications to the methane standards for production and processing segments and/or the methane and VOC standards for the transmission and storage segment in the 2016 NSPS OOOOa, as appropriate. Specifically, the EPA is proposing to:

- Revise 40 CFR 60.5385a(a)(1), 60.5410a(c)(1), 60.5415a(c)(1), 60.5420a(b)(4)(i), and 60.5420a(c)(3)(i) to clarify that hours or months of operation at reciprocating compressor facilities must be measured beginning with the date of initial startup, the effective date of the requirement (August 2, 2016), or the last rod packing replacement, whichever is

latest.

- Revise 40 CFR 60.5393a(b)(3)(ii) to correctly cross-reference paragraph (b)(3)(i) of that section.
- Revise 40 CFR 60.5397a(c)(8) to clarify the calibration requirements when Method 21 of appendix A-7 to part 60 is used for fugitive emissions monitoring.
- Revise 40 CFR 60.5397a(d)(3) to correctly cross-reference paragraphs (g)(3) and (4) of that section.
- Revise 40 CFR 60.5401a(e) to remove the word "routine" to clarify that pumps in light liquid service, valves in gas/vapor service and light liquid service, and pressure relief devices (PRDs) in gas/vapor service within a process unit at an onshore natural gas processing plant located on the Alaska North Slope are not subject to any monitoring requirements, whether the monitoring is routine or nonroutine.
- Revise 40 CFR 60.5410a(e) to correctly reference pneumatic pump affected facilities located at a well site as opposed to pneumatic pump affected facilities not located at a natural gas processing plant (which would include those not at a well site). This correction reflects that the 2016 NSPS OOOOa do not contain standards for pneumatic pumps at gathering and boosting compressor stations. 81 FR 35850.
- Revise 40 CFR 60.5411a(a)(1) to remove the reference to paragraphs 60.5412a(a) and (c) for reciprocating compressor affected facilities.
- Revise 40 CFR 60.5411a(d)(1) to remove the reference to storage vessels, as this paragraph applies to all the sources listed in 40 CFR 60.5411a(d), not only storage vessels.

- Revise 40 CFR 60.5412a(a)(1) and 60.5412a(d)(1)(iv) to clarify that all boilers and process heaters used as control devices on centrifugal compressors and storage vessels must introduce the vent stream into the flame zone. Additionally, revise 40 CFR 60.5412a(a)(1)(iv) and 60.5412a(d)(1)(iv)(D) to clarify that the vent stream must be introduced with the primary fuel or as the primary fuel to meet the performance requirement option. This is consistent with the performance testing exemption in 40 CFR 60.5413a and continuous monitoring exemption in 40 CFR 60.5417a for boilers and process heaters that introduce the vent stream with the primary fuel or as the primary fuel.
- Revise 40 CFR 60.5412a(c) to correctly reference both paragraphs (c)(1) and (2) of that section, for managing carbon in a carbon adsorption system.
- Revise 40 CFR 60.5413a(d)(5)(i) to reference fused silica-coated stainless steel evacuated canisters instead of a specific name brand product.
- Revise 40 CFR 60.5413a(d)(9)(iii) to clarify the basis for the total hydrocarbon span for the alternative range is propane, just as the basis for the recommended total hydrocarbon span is propane.
- Revise 40 CFR 60.5413a(d)(12) to clarify that all data elements must be submitted for each test run.
- Revise 40 CFR 60.5415a(b)(3) to reference all applicable reporting and recordkeeping requirements.
- Revise 40 CFR 60.5416a(a)(4) to correctly cross-reference 40 CFR 60.5411a(a)(3)(ii).
- Revise 40 CFR 60.5417a(a) to clarify requirements for controls not specifically listed in

paragraph (d) of that section.

- Revise 40 CFR 60.5422a(b) to correctly cross-reference 40 CFR 60.487a(b)(1) through (3) and (b)(5).
- Revise 40 CFR 60.5422a(c) to correctly cross-reference 40 CFR 60.487a(c)(2)(i) through (iv) and (c)(2)(vii) through (viii).
- Revise 40 CFR 60.5423a(b) to simplify the reporting language and clarify what data are required in the report of excess emissions for sweetening unit affected facilities.
- Revise 40 CFR 60.5430a to remove the phrase "including but not limited to" from the "fugitive emissions component" definition. During the 2016 NSPS OOOOa rulemaking, the EPA stated in a response to comment that this phrase is being removed,[190] but did not do so in that rulemaking.
- Revise 40 CFR 60.5430a to remove the phrase "at the sales meter" from the "low pressure well" definition to clarify that when determining the low-pressure status of a well, pressure is measured within the flow line, rather than at the sales meter.
- Revise Table 3 of 40 CFR part 60, subpart OOOOa to correctly indicate that the performance tests in 40 CFR 60.8 do not apply to pneumatic pump affected facilities.
- Revise Table 3 of 40 CFR part 60, subpart OOOOa to include the collection of fugitive emissions components at a well site and the collection of fugitive emissions components at a compressor station in the list of exclusions for notification of reconstruction.
- Revise 40 CFR 60.5393a(f), 60.5410a(e)(8), 60.5411a(e), 60.5415a(b), 60.5415a(b)(4), 60.5416a(d), 60.5420a(b), 60.5420a(b)(13), and introductory text in 60.5411a and

[190] See Docket ID Item No. EPA-HQ-OAR-2010-0505-7632, Chapter 4, page 4-319.

60.5416a, to remove language associated with the administrative stay we issued under 40 CFR 60.307(d)(7)(B) in *"Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources; Grant of Reconsideration and Partial Stay"* (June 5, 2017). The administrative stay was vacated by the D.C. Circuit on July 3, 2017.

XI. Summary of Proposed NSPS OOOOb and EG OOOOc

This section presents a summary of the specific NSPS standards and EG presumptive standards the EPA is proposing for various types of equipment and emission points. More details of the rationale for these standards and requirements, including alternative compliance options and exemptions to the standards, are provided in section XII of this preamble and the TSD for this action in the public docket. As stated in section I, the EPA intends to provide draft regulatory text for the proposed NSPS OOOOb and EG OOOOc in a supplemental proposal.

A. Fugitive Emissions from Well Sites and Compressor Stations

Fugitive emissions are unintended emissions that can occur from a range of equipment at any time. The magnitude of these emissions can also vary widely. The EPA has historically targeted fugitive emissions from the Crude Oil and Natural Gas source category through ground-based component level monitoring using OGI, or alternatively, EPA Method 21.

The EPA is proposing the following monitoring requirements and presumptive standards for the collection of fugitive emissions components located at well sites and compressor stations. Additional details for the proposed standards and proposed presumptive standards are included in the following subsections. Information received through the various solicitations in this section may be used to evaluate if a change in the BSER is appropriate from the proposed requirements below, specifically consideration of alternative measurement technologies as the BSER. Any

potential changes would be addressed through a supplemental proposal.

- Well sites with total site-level baseline methane emissions less than 3 tpy: demonstration, based on a site-specific survey, that actual emissions are reflected in the baseline methane emissions calculation,
- Well sites with total site-level baseline methane emissions of 3 tpy or greater: quarterly OGI or EPA Method 21 monitoring,
- (Co-proposal) Well sites with total site-level baseline methane emissions of 3 tpy or greater and less than 8 tpy: semiannual OGI or EPA Method 21 monitoring,
- (Co-proposal) Well sites with total site-level baseline methane emissions of 8 tpy or greater: quarterly OGI or EPA Method 21 monitoring,
- Compressor stations: quarterly OGI or EPA Method 21 monitoring,
- Well sites and compressor stations located on the Alaska North Slope: annual monitoring, with separate initial monitoring requirements, and
- Alternative screening approach for all well sites and compressor stations: bimonthly screening surveys using advanced measurement technology and annual OGI or EPA Method 21 monitoring at each individual well site or compressor station.

1. Definition of Fugitive Emissions Component

A key factor in evaluating how to target fugitive emissions is clearly identifying the emissions of concern and the sources of those emissions. In the 2016 NSPS OOOOa, the EPA defined "fugitive emissions component" as "any component with the potential to emit methane and VOCs" and included several specific component types, ranging from valves and connectors, to openings on controlled storage vessels that were not regulated under NSPS OOOOa.

However, data shows that the universe of components with potential for fugitive emissions is broader than the illustrative list included in the 2016 NSPS OOOOa, and that the majority of the largest emissions events occur from a subset of components that may not have been clearly included in the definition. Therefore, the EPA is proposing a new definition for "fugitive emissions component" to provide clarity that these sources of large emission events are covered.

"Fugitive emissions component" is proposed as "any component that has the potential to emit fugitive emissions of methane and VOC at a well site or compressor station, including valves, connectors, PRDs, open-ended lines, flanges, all covers and closed vent systems, all thief hatches or other openings on a controlled storage vessel, compressors, instruments, meters, natural gas-driven pneumatic controllers or natural gas-driven pumps. However, natural gas discharged from natural gas-driven pneumatic controllers or natural gas-driven pumps are not considered fugitive emissions if the device is operating properly and in accordance with manufacturers specifications. Control devices, including flares, with emissions resulting from the device operating in a manner that is not in full compliance with any Federal rule, State rule, or permit, are also considered fugitive emissions components." This proposed definition includes the same components that were included in the 2016 NSPS OOOOa and adds sources of large emissions, such as malfunctioning controllers or control devices.

The inclusion of specific component types in this proposed definition would allow the use of OGI, EPA Method 21, or an alternative screening technology to identify emissions that would either be repaired (*i.e.,* leaks) or have a root cause analysis with corrective action (*e.g.,* malfunctioning control device, unintentional gas carry through, venting from covers and

openings on a controlled storage vessel, or malfunctioning natural gas-driven pneumatic controllers). Further, we are proposing that where a CVS is used to route emissions from an affected facility (*i.e.,* centrifugal or reciprocating compressor, pneumatic pump, or storage vessel), the owner or operator would demonstrate there are no detectable emissions from the covers and CVS through the OGI (or EPA Method 21) monitoring conducted during the fugitive emissions survey. Where emissions are detected, corrective actions to complete all necessary repairs as soon as practicable would be required, and the emissions would be considered a potential violation of the no detectable emissions standard. In the case of a malfunction or operational upset of a control device or the equipment itself, where emissions are not expected to occur if the equipment is operating in compliance with the standards of the rule, this proposal would require the owner or operator to conduct a root cause analysis to determine why the emissions are present, take corrective action to complete all necessary repairs as soon as practicable and prevent reoccurrence of emissions, and report the malfunction or operational upset as a potential violation of the underlying standards for the source of the emissions. We are soliciting comment on whether to include the option to continue utilizing monthly AVO surveys as demonstrations of no detectable emissions from a CVS but are not proposing that option specifically. Because the EPA is proposing both NSPS and EG in this action, we anticipate that CVS associated with controlled pneumatic pumps will be located at well sites subject to fugitive emissions monitoring. Therefore, we do not believe the monthly AVO option is necessary. However, we are soliciting comment on whether there are circumstances where a CVS associated with a controlled pneumatic pump is located at a well site not otherwise subject to

fugitive emissions monitoring and where OGI (or EPA Method 21) would be an additional burden.

The EPA is soliciting comment on this proposed definition of "fugitive emissions component," including any additional components or characterization of components that should be included. Further, we are soliciting comment on the use of the fugitive emissions survey to identify malfunctions and other large emission sources where the equipment is not operating in compliance with the underlying standards, including the proposed requirement to perform a root cause analysis and to take corrective action to mitigate and prevent future malfunctions.

2. Fugitive Emissions from Well Sites

The current NSPS for reducing fugitive VOC and methane emissions at well sites requires semiannual monitoring, except that a low production well site (one that produces at or below 15 barrels of oil equivalent (boe) per day) is exempt from VOC monitoring. As explained in section X.A.1, we are proposing to remove that exemption from NSPS subpart OOOOa, as we have concluded that exemption was not justified by the underlying record and does not represent BSER. Further, based on our revised BSER analysis, which is summarized in section XII.A.1.a, the EPA is proposing updated standards for reducing fugitive VOC and methane emissions from the collection of fugitive emissions components located at new, modified, or reconstructed well sites (under the newly proposed NSPS OOOOb). Also, for the reasons discussed in section XII.A.2, the EPA is proposing to determine that the BSER analysis supports a presumptive standard for reducing methane emissions from the collection of fugitive emissions components located at existing well sites (under the newly proposed EG OOOOc) that is the same as what we are proposing for the NSPS (for NSPS OOOOb). Provided below is a summary of the proposed

updated NSPS and the proposed EG.

a. NSPS OOOOb

For new, modified, or reconstructed sources, we are proposing a fugitive emissions monitoring and repair program that includes monitoring for fugitive emissions with OGI in accordance with the proposed 40 CFR part 60, appendix K ("Appendix K"), which is included in this action and outlines the proposed procedures that must be followed to identify emissions using OGI.[191] We are also proposing that EPA Method 21 may be used as an alternative to OGI monitoring. We are further proposing that monitoring must begin within 90 days of startup of production (or startup of production after modification).

Unlike in NSPS OOOOa which, as amended by the 2020 Technical Rule, set VOC monitoring frequency based on production level, the EPA is proposing that the OGI monitoring frequency be based on the site-level methane baseline emissions,[192] as determined, in part, through equipment/component count emission factors. The EPA is proposing the calculation of the total site-wide methane emissions, including fugitive emissions from components, emissions from natural gas-driven pneumatic controllers, natural gas-driven pneumatic pumps, storage vessels, as well as other regulated and non-regulated emission sources. Specifically, we are proposing that owners or operators would calculate the site-level baseline methane emissions using a combination of population-based emission factors and storage vessel emissions. Further,

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[191] "*Determination of Volatile Organic Compound and Greenhouse Gas Leaks Using Optical Gas Imaging*" located at Docket ID No. EPA-HQ-OAR-2021-0317.

[192] As shown in the TSD, the EPA analyzed the monitoring frequency for both methane and VOC under both the single pollutant approach and the multipollutant approach. Because the composition of gas at a well site is predominantly methane (approximately 70 percent), a methane threshold represents the lowest threshold that is cost effective to control both VOC and methane emissions.

the EPA proposes this calculation would be repeated every time equipment is added to or removed from the site. For each natural gas-driven pneumatic pump, continuous bleed natural gas-driven pneumatic controller, and intermittent bleed natural gas-driven pneumatic controller located at the well site, the owner or operator would apply the population emission factors for all components found in Table W-1A of GHGRP subpart W. For each piece of major production and processing equipment and each wellhead located at the well site, the owner or operator would first apply the default average component counts for major equipment found in Table W-1B and Table W-1C of GHGRP subpart W, and then apply the component-type emission factors for the population of valves, connectors, open-ended lines, and PRVs found in Table 2-8 of the 1995 Emissions Protocol.[193] Finally, the owner or operator would use the calculated potential methane emissions after applying control (if applicable) for each storage vessel tank battery located at the well site. The sum of the emissions estimated for all equipment at the site would be used as the baseline methane emissions for determining the applicable monitoring frequency. The EPA proposes to use the default population emission factors found in Table W-1A of GHGRP subpart W and the default average component counts for major equipment found in Tables W-1B and W-1C of GHGRP subpart W because they are well-vetted emission and activity factors used by the Agency. The EPA is not incorporating these emission factors directly into the proposed NSPS OOOOb or EG OOOOc because they could be the subject of future GHGRP subpart W revisions, and if revised, those revisions would be relevant to this calculation. For the individual components (*e.g.,* valves and connectors), the EPA proposes to rely on the component-type emission factors found in Table 2-8 of the 1995 Emissions Protocol

[193] EPA, Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995.

for purposes of quantifying emissions from major production and processing equipment and each wellhead located at the well site because these data have been relied upon in previous rulemakings for this sector, have been the subject of extensive public comment, and the EPA has determined that they are appropriate to use for purposes of this action.

The EPA requests comment on whether the proposed methodologies for calculating site-level baseline methane emissions are appropriate for these emission sources, and if not, what methodologies would be more appropriate. Specifically, the EPA recognizes the proposed calculation methodology assumes all equipment is operating as designed (*e.g.,* controlled storage vessels with all vapors routed to a control that is actually achieving 95 percent reduction or greater). Therefore, we are soliciting comment on whether sites should use the uncontrolled PTE calculation for their storage vessels in their site-level baseline estimate to account for times when these vessels are not operating as designed, which is a known cause of large emission events of concern. Further, to that point, the EPA is soliciting comment on how to develop a factor that could be applied to the site-level baseline calculation that would account for large emission events, or any specific data that would provide a factor for these events. As we state throughout this preamble, large emission events are of specific concern and fugitive emissions monitoring is an effective tool for detecting these emissions, therefore, we acknowledge there is considerable interest from various stakeholders that these emission events are accounted for in our analyses. At this time, the EPA does not have enough information to develop a factor or determine how to best apply that factor. Information provided through this solicitation would allow us to consider additional revisions to this calculation methodology through a supplemental proposal.

The EPA is also soliciting comment on whether providing direct major equipment

population emission factors that can be combined with site-specific gas compositions would provide a more transparent and less burdensome means to develop the site-specific emissions estimates than using a combination of major equipment counts, specific component counts per major equipment, and component-level population emission factors. Furthermore, the EPA requests comment on whether site-level baseline methane emissions should be determined using a baseline emissions survey instead of the proposed methodology, and if so, what methodologies should be used to quantify emissions from the survey such as measurement or emission factors based on leaking component emission factors. The EPA also solicits comment on specific methodologies to support commenters' positions. The EPA also requests comment on whether there are additional production and processing equipment or emission sources that should be included in the site-level baseline methane emissions. For example, the EPA is aware that there could be emission sources such as engines, dehydrator venting, compressor venting, associated gas venting, and migration of gas outside of the wellbore at a well site. If such equipment or emission sources should be included in the site-level baseline, the EPA requests comment on methodologies for quantifying emissions for purposes of the baseline.

Based on the analysis described in section XII.A.1, the potential for fugitive emissions is impacted more by the number and type of equipment at the site, and not by the volume of production. Therefore, the EPA believes it is more appropriate to use site-specific emissions estimates based on the number and type of equipment located at the individual site to determine the monitoring frequency. Table 13 summarizes the proposed site-level baseline methane thresholds for the proposed monitoring frequencies, which according to our analysis would achieve the greatest cost-effective emission reductions.

As noted below, the EPA solicits comment on all aspects of the proposed tiered approach to monitoring that is summarized in Table 13. Although we are proposing no routine OGI monitoring where site-level baseline methane emissions are below 3 tpy, the EPA is proposing to require these sites to demonstrate the actual emissions are accounted for in the calculation. This demonstration would include a survey, such as OGI, EPA Method 21 (including provisions for the use of a soap solution), or advanced measurement technologies. Given that this demonstration is designed to show actual emissions are below 3 tpy, and most survey techniques are not quantitative, the EPA anticipates that sources finding emissions will make repairs on equipment/components identified as leaking during the demonstration survey.

The EPA acknowledges that the 2016 NSPS OOOOa and this proposal allow the use of EPA Method 21 as an alternative to OGI monitoring to detect fugitive emissions from the collection of fugitive emissions components under the proposed tiered approach to monitoring. However, as discussed in section XI.A.5, EPA Method 21 is not proposed as an alternative for follow-up OGI surveys under the proposed alternative screening approach using advanced measurement technologies when screening detects emissions. This is because EPA Method 21 is not able to find all sources of leaks and is therefore not an appropriate method for detection in these cases where large emissions events have been identified. Given this limitation, the EPA is soliciting comment on whether EPA Method 21 remains an appropriate alternative to OGI for routine OGI surveys.

TABLE 13. PROPOSED WELL SITE MONITORING FREQUENCIES BASED ON SITE-LEVEL BASELINE METHANE EMISSIONS

Site-level Baseline Methane Emissions Threshold	Proposed OGI Monitoring Frequency	Co-proposed OGI Monitoring Frequency
>0 and <3 tpy	No routine monitoring required	No routine monitoring required

≥3 and <8 tpy	Quarterly	Semiannual
≥8 tpy	Quarterly	Quarterly

Where quarterly monitoring is proposed, subsequent quarterly monitoring would occur at least 60 days apart. Where semiannual monitoring is co-proposed, subsequent semiannual monitoring would occur at least 4 months apart and no more than 7 months apart. We are proposing to retain the provision in the 2016 NSPS OOOOa that the quarterly monitoring may be waived when temperatures are below 0 °F for two of three consecutive calendar months of a quarterly monitoring period.

The EPA has previously required the use of OGI technology to detect fugitive emissions of methane and VOC from the oil and gas sector (*i.e.,* well sites and compressor stations). However, the EPA had not developed a protocol for its use even though the EPA has previously mentioned the need for an OGI protocol during other rulemakings where OGI has been proposed for leak detection.[194] Today, the EPA is proposing a draft protocol for the use of OGI as Appendix K to 40 CFR part 60. The EPA notes that while this protocol is being proposed for use in the oil and gas sector, the applicability of the protocol is broader. The protocol is applicable to surveys of process equipment using OGI cameras in the entire oil and gas upstream and downstream sectors from production to refining to distribution where a subpart in those sectors references its use.

[194] The development of Appendix K to 40 CFR part 60 was previously mentioned in both the proposal for the National Uniform Emission Standards for Storage Vessel and Transfer Operations, Equipment Leaks, and Closed Vent Systems and Control Devices; and Revisions to the National Uniform Emission Standards General Provisions (77 FR 17897, March 26, 2012) and the Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards (79 FR 36880, June 30, 2014).

As part of the development of Appendix K, the EPA conducted an extensive literature review on the technology development as well as observations on current application of OGI technology. Approximately 150 references identify the technology, applications, and limitations of OGI. The EPA also commissioned multiple laboratory studies and OGI technology evaluations. Additionally, on November 9 and 10, 2020, the EPA held a virtual stakeholder workshop to gather input on development of a protocol for the use of OGI. The information obtained from these efforts was used to develop the TSD for Appendix K, which provides technical analyses, experimental results, and other supplemental information used to evaluate and develop standardized procedures for the use of OGI technology in monitoring for fugitive emissions of VOCs, HAP, and methane from industrial environments.[195]

Appendix K outlines the proposed procedures that instrument operators must follow to identify leaks or fugitive emissions using a hand-held, field portable infrared camera. Additionally, Appendix K contains proposed specifications relating to the required performance of qualifying infrared cameras, required operator training and verification, determination of an operating window for performing surveys, and requirements for a monitoring plan and recordkeeping. The EPA is requesting comment on all aspects of the draft OGI protocol being proposed as Appendix K to 40 CFR part 60.[196]

As mentioned in section X.B.4.f, we are proposing that, once fugitive methane emissions are detected during the OGI survey, a first attempt at repair must be made within 30 days of detecting the fugitive emissions, with final repair, including resurvey to verify repair, completed

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[195] *Technical Support Document – Optical Gas Imaging Protocol (40 CFR Part 60, Appendix K)*, available in the docket for this action.
[196] See Appendix K in Docket ID No. EPA-HQ-OAR-2021-0317.

within 30 days after the first attempt. These proposed repair requirements with respect to methane fugitive emissions are the same as those made in the 2020 Technical Rule for VOC fugitive emissions (and proposed in section X.B.4.f for methane in this action). Because large emission events contribute disproportionately to emissions, the EPA is soliciting comment on how to structure a requirement that would tier repair deadlines based on the severity of the fugitive emissions identified during the OGI (or EPA Method 21) surveys. In order for such a structure to work, there would need to be a way to qualify which fugitive emissions are smaller and which are larger, as the initial monitoring with OGI will not provide this information. One approach could be to define broad categories of leaks and make assumptions about the magnitude of emissions for those broad categories. For example, an open thief hatch would be considered a very large leak due to the surface opening size, and it would need to be remedied on the tightest timeframe, whereas a leaking connector would be considered a small leak based on historical emissions factors and could be repaired on a more lenient timeframe. The EPA is soliciting comments on how this approach could be structured, particularly the types of leaks that would fall into each broad category and the appropriate repair timeframes for each of the categories. The EPA is also soliciting comment on other approaches that could also be implemented for repairing fugitive emissions in a tiered structure. Finally, we are proposing to retain the requirement for owners and operators to develop a fugitive emissions monitoring plan that covers all the applicable requirements for the collection of fugitive emissions components located at a well site and includes the elements specified in the proposed Appendix K when using OGI.

The affected facilities include well sites with major production and processing

equipment, and centralized tank batteries. As in the 2020 Technical Rule, the EPA is proposing to not include "wellhead only well sites," as affected facilities when the well site is a wellhead only well site at the date it becomes subject to the rule. Based on the proposed site-level baseline methane emissions calculation methodology, wellhead only sites would only calculate emissions from fugitive components (*e.g.,* valves, connectors, flanges, and open-ended lines) that are located on the wellhead. We believe these sites would not exceed the 3 tpy threshold to require routine monitoring. However, unlike the 2020 Technical Rule, the EPA is proposing that when a well site later removes all major production and processing equipment such that it becomes a wellhead only well site, it must recalculate the emissions in order to determine if a different frequency is then required. In this proposal, the definitions for "wellhead only well site" and "well site" would be the same as those finalized in the 2020 Technical Rule. Specifically, "wellhead only well site" means "for purposes of the fugitive emissions standards, a well site that contains one or more wellheads and no major production and processing equipment." The term "major production and processing equipment" refers to "reciprocating or centrifugal compressors, glycol dehydrators, heater/treaters, separators, and storage vessels collecting crude oil, condensate, intermediate hydrocarbon liquids, or produced water." The EPA is soliciting comment on whether any other equipment not included in this definition should be added in order to clearly specify what well sites are considered wellhead only sites. Specifically, the EPA is soliciting comment on the inclusion of natural gas-driven pneumatic controllers, natural gas-driven pneumatic pumps, and pumpjack engines in the definition of "major production and processing equipment." A "well site" means "one or more surface sites that are constructed for the drilling and subsequent operation of any oil well, natural gas well, or injection well. For

purposes of the fugitive emissions standards, a well site includes a centralized production facility. Also, for purposes of the fugitive emissions standards, a well site does not include: (1) UIC Class II oilfield disposal wells and disposal facilities; (2) UIC Class I oilfield disposal wells; and (3) the flange immediately upstream of the custody meter assembly and equipment, including fugitive emissions components, located downstream of this flange."

In addition to retaining the above definitions, the EPA is also proposing a new definition for "centralized production facility" for purposes of fugitive emissions requirements for well sites, where a "centralized tank battery" is "one or more permanent storage tanks and all equipment at a single stationary source used to gather, for the purpose of sale or processing to sell, crude oil, condensate, produced water, or intermediate hydrocarbon liquid from one or more offsite natural gas or oil production wells. This equipment includes, but is not limited to, equipment used for storage, separation, treating, dehydration, artificial lift, combustion, compression, pumping, metering, monitoring, and flowline. Process vessels and process tanks are not considered storage vessels or storage tanks. A centralized production facility is located upstream of the natural gas processing plant or the crude oil pipeline breakout station and is a part of producing operations." Additional discussion on centralized production facilities is included in section XI.L.

The EPA is not proposing any change to the current definition of modification as it relates to fugitive emissions requirements at well sites or centralized production facilities. Specifically, modification occurs at a well site when: (1) A new well is drilled at an existing well site; (2) a well at an existing well site is hydraulically fractured; or (3) a well at an existing well site is hydraulically refractured. Similarly, modification occurs at a centralized production

facility when (1) any of the actions above occur at an existing centralized production facility; (2) a well sending production to an existing centralized production facility is modified as defined above for well sites; or (3) a well site subject to the fugitive emissions standards for new sources removes all major production and processing equipment such that it becomes a wellhead only well site and sends production to an existing centralized production facility.

b. EG OOOOc

For existing well sites (for EG OOOOc), we are proposing a presumptive standard that follows the same fugitive monitoring and repair program as for new sources. For the reasons discussed in section XII.A.2, the BSER analysis for existing sources supports proposing a presumptive standard for reducing methane emissions from the collection of fugitive emissions components located at existing well sites that is the same as what the EPA is proposing for new, reconstructed, or modified sources (for NSPS OOOOb). The EPA did not identify any factors specific to existing sources that would alter the analysis performed for new sources to make that analysis different for existing well sites. The EPA determined that the OGI technology, methane emission reductions, costs, and cost effectiveness discussed above for the collection of fugitive emissions components at new well sites are also applicable for the collection of fugitive emissions components at existing well sites. Further, the fugitive emissions requirements do not require the installation of controls on existing equipment or the retrofit of equipment, which can generally be an additional factor for consideration when determining the BSER for existing sources. Therefore, the EPA found is appropriate to use the analysis developed for the proposed NSPS OOOOb to also develop the BSER and proposed presumptive standards for the EG OOOOc.

Based on the information available at this time, the EPA thinks the large number of existing well sites, many of which are not complex warrants soliciting comment on whether existing well sites (or a subcategory thereof) could have different emission profiles due to certain site characteristics or other factors that would suggest a different presumptive standard is appropriate. Further, we remain concerned about the burden of fugitive emissions monitoring requirements on small businesses. Therefore, we are requesting comment on regulatory alternatives for well sites that accomplish the stated objectives of the CAA and which minimize any significant economic impact of the proposed rule on small entities, including any information or data that pertain to the emissions impacts and costs of our proposal to remove the exemption from fugitive monitoring for well sites with low emissions, or would support alternative fugitive monitoring requirements for these sites. We are soliciting data that assess the emissions from low production well sites, and information on any factors that could make certain well sites less likely to emit VOC and methane, including geologic features, equipment onsite, production levels, and any other factors that could establish the basis for appropriate regulatory alternatives for these sites. Further, the EPA is aware there are a subset of existing well sites that are owned by individual homeowners, farmers, or companies with very few employees (well below the threshold defining a small business). For these owners, the EPA is concerned our analysis underestimates the actual burden imposed by these proposed standards. As an example, ownership may be limited to 1 or 2 wells located on an individual's property, for which the production is used for heating the home. The cost burden of conducting fugitive emissions surveys in this type of scenario has not fully be analyzed. Therefore, the EPA solicits comment and information that would allow us to further evaluate the burden on the smallest companies to

further propose appropriate standards at this subset (or other similar subsets) of well sites through a supplemental proposal.

Finally, we are soliciting comment on all aspects of the proposed fugitive emissions requirements for both new and existing well sites, including whether we should use the tiering approach, whether the tiers we have defined are appropriate, and the monitoring requirements for each tier, including whether it would be cost-effective to monitor at more frequent intervals than proposed. The EPA may include revisions to this proposal for ground-based OGI monitoring at well sites if information is received that would warrant consideration of a different approach to establishing monitoring frequencies at well sites.

3. Fugitive Emissions from Compressor Stations

The current NSPS for reducing fugitive emissions from the collection of fugitive emissions components located at a compressor station is a fugitive emissions monitoring and repair program requiring quarterly OGI monitoring.[197] Based on our analysis, which is summarized in section XII.A.1.b, the EPA is proposing quarterly OGI monitoring requirement for both methane and VOC as it continues to reflect the BSER for reducing both emissions from fugitive components at new, modified, and reconstructed compressor stations. Likewise, the EPA is also proposing quarterly monitoring as a presumptive GHG standard (in the form of limitation on methane emissions) for the collection of fugitive emissions components located at existing compressor stations. The affected compressor stations include gathering and boosting, transmission, and storage compressor stations.

[197] Note that for gathering and boosting compressor stations, the EPA is proposing to rescind the 2020 Technical Rule amendment that changed the monitoring frequency to semiannual for VOC emissions. See section X.A.2 for more information.

a. NSPS OOOOb

We are proposing that the quarterly monitoring using OGI be conducted in accordance with the proposed Appendix K described above in section XI.A.2, which outlines procedures that must be followed to identify leaks using OGI. We are proposing to retain the current requirements that monitoring must begin within 90 days of startup of the station (or startup after modification), with subsequent quarterly monitoring occurring at least 60 days apart. Also, quarterly monitoring may be waived when temperatures are below 0 °F for two of three consecutive calendar months of a quarterly monitoring period. We are also not proposing any change to the following repair-related requirements: Specifically, a first attempt at repair must be made within 30 days of detecting the fugitive emissions, with final repair, including resurvey to verify repair, completed within 30 days after the first attempt. In addition, owners and operators must develop a fugitive emissions monitoring plan that covers all the applicable requirements for the collection of fugitive emissions components located at a compressor station. In conjunction with the proposed requirement that monitoring be conducted in accordance with the proposed Appendix K, we are proposing to require that the monitoring plan also include elements specified in the proposed Appendix K when using OGI.

b. EG OOOOc

For existing sources, we are proposing a presumptive standard that includes the same fugitive emissions monitoring and repair program as for new sources. For the reasons discussed in section XII.A.2, the BSER analysis for existing sources supports proposing a presumptive standard for reducing methane emissions from the collection of fugitive emissions components located at existing compressor stations that is the same as what the EPA is proposing for new,

modified, or reconstructed sources (for NSPS OOOOb).

Similar to well sites, we are soliciting comment on all aspects of the proposed quarterly monitoring for both new and existing compressor stations, including whether more frequent monitoring would be appropriate. We are also soliciting information on several additional topics. First, the EPA is soliciting comment and data to assess whether compressor stations should be subcategorized for the NSPS and/or the EG, which the EPA could consider through a supplemental proposal. For example, some industry stakeholders have asserted that station throughput directly correlates to the operating pressures, equipment counts, and condensate production, which would influence fugitive emissions at the station. They suggested that subcategorization based on design throughput capacity for the compressor station may be appropriate. We are specifically seeking information related to throughputs where fugitive emissions of methane are demonstrated to be minimal below a certain capacity. While this specific example was raised in the context of existing sources only, the EPA is also soliciting comment on whether new, modified, or reconstructed compressor stations could encounter the same issue and therefore warrant similar subcategorization.

Next, for compressor stations, we are soliciting comment on delayed repairs by existing sources when parts are not readily available and must be special ordered. In comments submitted to the EPA as part of the stakeholder outreach conducted prior to this proposal, industry stakeholders stated that the EPA "should acknowledge that existing sources are older pieces of equipment so there is a higher likelihood that replacement parts will not be readily available; therefore, a lack of available parts should be an appropriate cause to delay a repair."[198] Industry

[198] Document ID No. EPA-HQ-OAR-2021-0295-0033.

stakeholders further explained that operators will need to special order replacement parts. Further, they stated in their comments that operators should be afforded 30 days to schedule the repair once they have received the replacement part. The EPA is soliciting comment and data to better understand the breadth of this issue with replacement parts for existing compressor stations. Additionally, we are soliciting comment on whether 30 days following receipt of the replacement part is appropriate for completing delayed repairs at existing compressor stations, whether there should be any limit on delays in repairs under these circumstances, and whether this compliance flexibility should be limited or disallowed based on the severity of the leak to be repaired.

We are also soliciting comment on the specific records that should be maintained and/or reported to justify delayed repairs as a result of part availability issues. Depending on the additional information received, the EPA may consider proposing changes to the proposed EG for compressor stations through a supplemental proposal.

Finally, as discussed in section XI.A.2, the EPA is soliciting comment on whether the scheduling of repairs at compressor stations should be tiered based on severity of the emissions found. Please refer to section XI.A.3 for additional details on this solicitation for comment.

4. Well Sites and Compressor Stations on the Alaska North Slope

For new, reconstructed, and modified well sites and compressor stations located on the Alaska North Slope, based on the rationale provided in section X.B.4.c of this preamble, the EPA is proposing the same monitoring requirements as those in NSPS OOOOa (under newly proposed OOOOb). Also, the EPA is proposing to determine that the same technical infeasibility issues with weather conditions exist for existing well sites and compressor stations located on the

Alaska North Slope. Therefore, the EPA is proposing a presumptive standard for reducing methane emissions from the collection of fugitive emissions components located at existing well sites and compressor stations located on the Alaska North Slope (under the newly proposed EG OOOOc) that is the same as what we are proposing for NSPS OOOOb.

Specifically, the EPA is proposing to require annual monitoring of methane and VOC emissions at all well sites and compressor stations located on the Alaska North Slope, with subsequent annual monitoring at least 9 months apart but no more than 13 months apart. The EPA is also proposing to require that new, reconstructed, and modified well sites and compressor stations located on the Alaska North Slope that startup (initially, or after reconstruction or modification) between September and March to conduct initial monitoring of methane and VOC fugitive emissions within 6 months of startup, or by June 30, whichever is later. Finally, the EPA is proposing to require that new, reconstructed, and modified well sites and compressor stations located on the Alaska North Slope that startup (initially, or after reconstruction or modification) between April and August to conduct initial monitoring of methane and VOC fugitive emissions within 90 days of startup.

5. Alternative Screening Using Advanced measurement Technologies

For new, modified, or reconstructed sources (*i.e.,* collection of fugitive emissions components located at well sites and compressor stations), the EPA is proposing an alternative fugitive emissions monitoring and repair program that includes bimonthly screening for large emission events using advanced measurement technologies followed with at least annual OGI in accordance with the proposed 40 CFR part 60, appendix K ("Appendix K"), which is included in this action and outlines the proposed procedures that must be followed to identify emissions

using OGI.[199] Additionally, we are proposing this same alternative screening using advanced measurement technologies as an alternative presumptive standard for existing sources.

Specifically, the EPA is proposing to allow owners and operators the option to comply with this alternative fugitive emissions standard instead of the proposed ground based OGI surveys summarized in sections XI.A.2 and XI.A.3. The EPA proposes to require owners and operators choosing this alternative standard to do so for all affected well sites and compressor stations within a company-defined area. This company-defined area could be a county, sub-basin, or other appropriate geographic area. Under this proposed alternative, the EPA proposes to require a screening survey on a bimonthly basis using a methane detection technology that has been demonstrated to achieve a minimum detection threshold of 10 kg/hr. This screening survey would be used to identify individual sites (*i.e.,* well sites and compressor stations) where a follow-up ground-based OGI survey of all fugitive emissions components at the site is needed because fugitive emissions have been detected. Given the proposed minimum detection threshold of 10 kg/hr, which would constitute a significant emissions event, the EPA believes this follow-up OGI survey should be completed in an expeditious timeframe, therefore we are proposing to require this follow-up OGI survey of all fugitive emissions components at the site within 14 days of the screening survey. However, additional information is needed to fully evaluate the appropriateness of this deadline. Therefore, the EPA is soliciting comment on the proposed 14-day deadline for a follow-up OGI survey and information that would allow further evaluation of other potential deadlines to require.

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[199] "*Determination of Volatile Organic Compound and Greenhouse Gas Leaks Using Optical Gas Imaging*" located at Docket ID No. EPA-HQ-OAR-2021-0317.

Next, for sites with emissions identified during screening and subject to this follow-up OGI survey, the EPA proposes that any fugitive emissions identified must be repaired, including those emissions identified during the screening survey. For purposes of this proposal, the EPA is proposing the same repair deadlines as those for the ground based OGI requirements discussed in sections XI.A.2 and XI.A.3, which are a first attempt at repair within 30 days of the OGI survey and final repair completed within 30 days of the first attempt. As noted in section XI.A.1, some equipment types with large emissions warrant a requirement for root cause analysis rather than simply repairing the emission source. The EPA solicits comment on how that root cause analysis with corrective action approach could be applied in this proposed alternative screening approach. Further, because large emission events, especially those identified during the screening surveys, contribute disproportionately to emissions, the EPA is also soliciting comment on how to structure a requirement that would tier repair deadlines based on the severity of the fugitive emissions when using this proposed alternative standard. See section XI.A.2 for additional discussion of this solicitation on tiered repairs.

In addition to the bimonthly screening surveys proposed above, the EPA recognizes that component-level fugitive emissions may still be present at sites where the screening survey does not detect emissions. Therefore, in conjunction with these bimonthly screenings performed with the advanced measurement technology, the EPA is proposing to require a full OGI (or EPA Method 21) survey at least annually at each individual site utilizing the alternative screening standard. If the owner or operator performs an OGI survey in response to emissions found during the bimonthly screening survey, that OGI survey would count as the annual OGI survey; a second survey would not be required to comply with the annual OGI survey requirement and the

clock would restart with the next annual survey due within 12 calendar months. The overall purpose of this annual OGI survey is to ensure that each individual site is surveyed with OGI at least annually, even where large emissions are not detected during the screening surveys using advanced measurement technology. The EPA is not allowing EPA Method 21 for use during the proposed follow-up OGI surveys when screening detects emissions because EPA Method 21 is not appropriate for detecting the sources of large emission events, such as malfunctioning control devices.

Finally, the EPA is proposing to require that owners and operators include information specific to the alternative standard within their fugitive emissions monitoring plan. Since the 2016 NSPS OOOOa, owners and operators have been required to develop and maintain a fugitive emissions monitoring plan for all sites subject to the fugitive emissions requirements. This monitoring plan includes information regarding which sites are covered under the plan, which technology is being used (*e.g.,* OGI or EPA Method 21), and site or company-specific procedures that are employed to ensure compliant surveys. The EPA is proposing to add a requirement that the monitoring plan also address sites that are utilizing the proposed alternative standard. Specifically, the EPA is proposing a requirement to include the following information when the alternative standard is applied:

- Identification of the sites opting to comply with the alternative screening approach;
- General description of each site to be monitored, including latitude and longitude coordinates of the asset in decimal degrees to an accuracy and precision of five decimals of a degree using the North American Datum of 1983;
- Description of the measurement technology;

- Verification that the technology meets the 10 kg/hr methane detection threshold, including supporting data to demonstrate the sensitivity of the measurement technology as applied;
- Procedures for a daily verification check of the measurement sensitivity under field conditions (*e.g.,* controlled releases);
- Standard operating procedures consistent with EPA's guidance[200] and to include safety considerations, measurement limitations, personnel qualification/responsibilities, equipment and supplies, data and record management, and quality assurance/quality control (*i.e.,* initial and ongoing calibration procedures, data quality indicators, and data quality objectives); and
- Procedures for conducting the screening.

In the event that an owner or operator uses multiple technologies covered by one monitoring plan, the owner or operator would identify which technology is to be used on which site within the monitoring plan.

In addition to the proposed requirements within the monitoring plan, the EPA is also proposing specific recordkeeping and reporting requirements associated with the follow-up OGI surveys that are consistent with the recordkeeping and reporting required for OGI surveys in NSPS OOOOa as amended in the 2020 Technical Rule. See section X.B.1.h and X.B.1.i. The EPA is soliciting comment on when notifications would be required for sites where the alternative standard is applied. Further, the EPA is soliciting comment on whether submission of

[200] Guidance for Preparing Standard Operating Procedures (SOPs), EPA/600/B-07/001, April 2007, https://www.epa.gov/sites/default/files/2015-06/documents/g6-final.pdf

the monitoring plan, and/or Agency approval before utilizing the alternative standard is necessary to ensure consistency in screening survey procedures in the absence of finalized methods or procedures.

While the EPA is proposing the above alternative screening requirements, additional information is necessary to further refine the specific alternative work practice as it relates to the available technologies. Specific information is requested in the following paragraphs, and, if received, would allow the EPA to better analyze the BSER for fugitive emissions at well sites and compressor stations through a supplemental proposal.

First, the EPA solicits comment on the use of 10 kg/hr as the minimum detection threshold for the advanced measurement technologies used in the alternative screening approach, including data that would support consideration of another detection threshold. The EPA also solicits comment on whether a matrix approach should be developed, instead of prescribing one detection threshold and screening frequency, and what that matrix should look like. In the matrix approach, the frequency of the screening surveys and regular OGI (or EPA Method 21) surveys would be based on the sensitivity of the technology, with the most sensitive detection thresholds having the least frequent screening and survey requirements and the least sensitive detection thresholds having the most frequent screening and survey requirements. For example, sites that are screened using a technology with a detection threshold of 1 kg/hr may require less frequent screening and may require an OGI survey less frequently than sites screened using a technology with a detection threshold of 50 kg/hr. We are also soliciting comment on the detection sensitivity of commercially available methane detection technologies based on conditions expected in the field, as well as factors that affect the detection sensitivity and how the detection

sensitivity would change with these factors.

Next, the EPA is soliciting comment on the standard operating procedures being used for commercially available technologies, including any manufacturer recommended data quality indicators and data quality objectives in use to validate these measurements. Additionally, for those commercially available technologies that quantify methane emissions rather than just detect methane, we are soliciting comment on the range of quantification based on conditions one would expect in the field.

The EPA is seeking information that would allow us to further evaluate the potential costs and assumed emission reductions achieved through an alternative screening program. Therefore, the EPA is seeking information on the cost of screening surveys using different types of advanced measurement technologies, singularly or in combination, and factors that affect that cost (*e.g.,* is it influenced by the number of sites and length of survey). Additionally, we are interested in understanding whether there would be opportunities for cost-sharing among operators and whether any aspect of regulation would be beneficial or required to facilitate such cost-sharing opportunities. We also solicit comment on whether these technologies and cost-sharing opportunities would allow for cost-effective monitoring at all sites owned or operated by the same company within a sub-basin or other discrete geographic area. Further, we seek comment on the current and expected availability of these advanced measurement technologies and the supporting personnel and infrastructure required to deploy them, how their cost and availability might be affected if demand for these technologies were to increase, and how quickly the use of these technologies could expand if they were integrated into this regulatory program either as a required element of fugitive monitoring or as this proposed alternative work practice.

The EPA recognizes that the approach outlined above may not be suited to continuous monitoring technologies, such as network sensors or open-path technology. While these systems typically have the ability to meet the 10 kg/hr methane threshold discussed above[201] the emissions from these well sites can be intermittent or tied to process events (*e.g.,* pigging operations). We are concerned that the proposed alternative screening approach would trigger an OGI survey for every emission event, regardless of type, duration, or size, if a continuous monitoring technology is installed. This would disincentivize the use of continuous monitoring systems, which could be valuable tools in finding large emission sources sooner. While we believe that a framework for advanced measurement technologies that monitor sites continuously should be developed, we do not currently have all of the information that is necessary to develop an equivalence demonstration for these monitors or to ensure the technology works appropriately over time. Therefore, we are soliciting comment on how an equivalence demonstration can be made for these continuous monitoring technologies.

The framework for a continuous monitoring technology would need to cover the following items at a minimum: The number of monitors needed and the placement of the monitors; minimum response factor to methane; minimum detection level; frequency of data readings; how to interpret the monitor data to determine what emissions are a detection versus baseline emissions; how to determine allowable emissions versus leaks; the meteorological data criteria; measurement systems data quality indicators; calibration requirements and frequency of calibration checks; how downtime should be handled; and how to handle situations where the

[201] Alden et al., Single-Blind Quantification of Natural Gas Leaks from 1 km Distance Using Frequency Combs, *Environmental Science and Technology*, 2019, *53*, 2908-2917.

source of emissions cannot be identified even when the monitor registers a leak. We are soliciting comment on how to develop a framework that is flexible for multiple technologies while still ensuring that emissions are adequately detected and the monitors respond appropriately over time. Additionally, we are soliciting comment on whether these continuous monitors need to respond to other compounds as well as methane; how close a meteorological station must be to the monitored site; and whether OGI or EPA Method 21 surveys should still be required, and if so, at what frequency.

At this time, the EPA does not have enough information to determine how this proposed alternative standard using advanced measurement technologies compares to the proposed BSER of OGI monitoring at well sites at a frequency that is based on the site baseline methane emissions as described in section XI.A.3.a, or to quarterly OGI monitoring at compressor stations. Information provided through this solicitation may be used to reevaluate BSER through a supplemental proposal.

6. Use of Information from Communities and Others

As the EPA learned during the Methane Detection Technology Workshop, industry, researchers, and NGOs have utilized advanced methane detection systems to quickly identify large emission sources and target ground based OGI surveys. State and local governments, industry, researchers, and NGOs have been utilizing advanced technologies to better understand the detection of, source of, and factors that lead to large emission events. The EPA anticipates that the use of these techniques by a variety of parties, including communities located near oil and gas facilities or affected by oil and gas pollution, will continue to grow as these technologies become more widely available and decline in cost.

The EPA is seeking comment on how to take advantage of the opportunities presented by the increasing use of these technologies to help identify and remediate large emission events (commonly known as "super-emitters"). Specifically, the EPA seeks comment on how to evaluate, design, and implement a program whereby communities and others could identify large emission events and, where there is credible information of such a large emission event, provide that information to owners and operators for subsequent investigation and remediation of the event. The EPA understands that these large emission events are often attributable to malfunctions or abnormal process conditions that should not be occurring at a well-operating, well-maintained, and well-controlled facility that has implemented the various BSER measures identified in this proposal.

We generally envision a program for finding large emission events that consists of a requirement that, if emissions are detected above a defined threshold by a community, a Federal or State agency, or any other third party, the owner or operator would be required to investigate the event, do a root cause analysis, and take appropriate action to mitigate the emissions, and maintain records and report on such events.

We seek comment on all aspects of this concept, which would be developed further as part of a supplemental proposal. Among other things, the EPA is soliciting comment on an emissions threshold that could be used to define these large emission events, and which types of technologies would be suitable for identification of large emissions events. For example, there are some satellite systems capable of generally identifying emissions above 100 kg/hr with a

spatial resolution which could allow identification of emission events from an individual site.[202] Additionally there are other satellites systems available which have wider spatial resolution that can identify large methane emission events, and when combined with finer resolution platforms, could allow identification of emission events from an individual site. The EPA believes that any emissions visible by satellites should qualify as large emission events. However, the EPA solicits comment on whether the threshold for a large emission should be lower than what is visible by satellite.

Second, in order to make this approach viable, the EPA would need to specify what actions an owner or operator must take when notified of a large emission event, including deadlines for taking such actions. These elements could include the specific steps the company would take to investigate the notification and mitigate the event, such as verifying the location of the emissions, conducting ground investigations to identify the specific emission source, conducting a root cause analysis, performing corrective action within a specific timeframe to mitigate the emissions, and preventing ongoing and future chronic or intermittent large emissions from that source. These steps could be incorporated into a fugitive emissions monitoring plan maintained by the owner or operator, and failure to take the actions specified by the owner or operator in the plan could be considered noncompliance. We seek comment on what specific follow-up actions or other procedures would be appropriate to require once a large emission event is identified, as well as appropriate deadlines for these actions.

Third, the EPA would need to define guidelines for credible and actionable data. The

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[202] D.J. Varon, J. McKeever, D. Jervis, J.D. Maasakkers, S. Pandey, S. Houweling, I. Aben, T. Scarpelli, D.J. Jacob, *Satellite Discovery of anomalously Large Methane Point Sources from Oil/Gas Production*, available at *https://doi.org/10.1029/2019GL083798*, October 25, 2019.

EPA is soliciting comment on what these guidelines should entail and whether specific protocols (*e.g.*, permissible detection technologies, data analytics, operator training, data reporting, public access, and data preservation) should govern the collection of such data and whether such data should conform to any type of certification. If specific certification or protocols are necessary, the EPA is soliciting comment on how that certification should be obtained.

Fourth, we are also soliciting comment on best practices for the identification of the correct owner or operator of a facility responsible for such large emissions, since such information is necessary to halt such large-volume emission events, and how the community or other third-party should notify the owner or operator, as well as how the delegated authority should be made aware of such notification.

Finally, we are soliciting comment on whether the EPA should develop a model plan for responding to notifications that companies could adopt instead of developing company- or site-specific plans, including what elements should be included in that model plan.

B. Storage Vessels

1. NSPS OOOOb

The current NSPS in OOOOa for storage vessels is to reduce VOC emissions by 95 percent, and the standard applies to a single storage vessel with a potential for 6 or more tpy of VOC emissions. Based on our analysis, which is summarized in section XII.B.1, the EPA is proposing to retain the 95 percent reduction standard as it continues to reflect the BSER for reducing VOC emissions from new storage vessels. The EPA is also proposing to set GHG standards (in the form of limitations on methane emissions) for storage vessels in this action. Because the BSER for reducing VOC and methane emissions are the same, the proposed GHG

standard is to reduce methane emissions by 95 percent. The EPA continues to support the capture of gas vapors from storage vessels rather than the combustion of what can be an energy-rich saleable product. We incentivize this by recognizing the use of vapor recovery as a part of the process, therefore the storage vessel emissions would not contribute to the site's potential-to-emit.

Under the current NSPS for storage vessels, an affected facility is a single storage vessel with potential VOC emissions of 6 tpy or greater. The EPA is proposing to include a tank battery as a storage vessel affected facility. The EPA proposes to define a tank battery as a group of storage vessels that are physically adjacent and that receive fluids from the same source (*e.g.,* well, process unit, compressor station, or set of wells, process units, or compressor stations) or which are manifolded together for liquid or vapor transfer.

To determine whether a single storage vessel is an affected facility, the owner or operator would compare the 6 tpy VOC threshold to the potential emissions from that individual storage vessel; to determine whether a tank battery is an affected facility, the owner or operator would compare the 6 tpy VOC threshold to the aggregate potential emissions from the group of storage vessels. For new, modified, or reconstructed sources, if the potential VOC emissions from a storage vessel or tank battery exceeds the 6 tpy threshold, then it is a storage vessel affected facility and controls would be required. This is consistent with the EPA's initial determination in the 2012 NSPS OOOO that controlling VOC emissions as low as 6 tpy from storage vessels is cost-effective. The proposed standard of 95 percent reduction of methane and VOC emissions, which is the same as the current VOC standard in the 2012 NSPS OOOO and 2016 NSPS OOOOa, can be achieved by capturing and routing the emissions utilizing a cover and closed

vent system that routes captured emissions to a control device that achieves an emission reduction of 95 percent, or that routes captured emissions to a process.

Finally, we are proposing specific provisions to clarify what circumstances constitute a modification of an existing storage vessel affected facility (single storage vessel or tank battery), and thus subject it to the proposed NSPS instead of the EG. The EPA is proposing that a single storage vessel or tank battery is modified when physical or operational changes are made to the single storage vessel or tank battery that result in an increase in the potential methane or VOC emissions. Physical or operational changes would be defined to include: (1) The addition of a storage vessel to an existing tank battery; (2) replacement of a storage vessel such that the cumulative storage capacity of the existing tank battery increases; and/or (3) an existing tank battery or single storage vessel that receives additional crude oil, condensate, intermediate hydrocarbons, or produced water throughput (from actions such as refracturing a well or adding a new well that sends these liquids to the tank battery). The EPA is proposing to require that the owner or operator recalculate the potential VOC emissions when any of these actions occur on an existing tank battery to determine if a modification has occurred. The existing tank battery will only become subject to the proposed NSPS if it is modified pursuant to this definition of modification and its potential VOC emissions exceed the proposed 6 tpy VOC emissions threshold.

2. EG OOOOc

Based on our analysis, which is summarized in section XII.B.2, the EPA is proposing EG for existing storage vessels which include a presumptive GHG standard (in the form of limitation on methane emissions). For existing sources under the EG, the EPA is proposing to define a

designated facility as an existing tank battery with potential methane emissions of 20 tpy or greater. The proposed definition of a tank battery in the EG is the same as the definition proposed for new sources; however, since the designated pollutant in the context of the EG is methane, determination of whether a tank battery is a designated facility would be based on its potential methane emissions only. Our analysis shows that it is cost effective to control an existing tank battery with potential methane emissions 20 tpy or higher. Similar to the proposed NSPS, we are proposing a presumptive standard that includes a 95 percent reduction of the methane emissions from each existing tank battery that qualifies as a designated facility. Such a standard could be achieved by capturing and routing the emissions by utilizing a cover and closed vent system that routes captured emissions to a control device that achieves an emission reduction of 95 percent, or routes emission back to a process.

C. Pneumatic Controllers

1. NSPS OOOOb

The current NSPS OOOOa regulates certain continuous bleed natural gas driven pneumatic controllers, but includes different standards based on whether the pneumatic controller is located at an onshore natural gas processing plant. If the pneumatic controller is located at an onshore natural gas processing plant, then the current NSPS requires a zero bleed rate. If the pneumatic controller is located elsewhere, then the current NSPS requires the pneumatic controller to operate at a natural gas bleed rate no greater than 6 scfh. The current NSPS does not regulate intermittent vent natural gas driven pneumatic controllers at any location.

Based on our analysis, which is summarized in section XII.C.1, the EPA is proposing

pneumatic controller standards for NSPS OOOOb as follows. First, in addition to each single natural gas-driven continuous bleed pneumatic controller being an affected facility, the EPA proposes to define each natural gas-driven intermittent vent pneumatic controller as an affected facility. The EPA believes these pneumatic controllers should be covered by NSPS OOOOb because natural gas-driven intermittent devices represent a large majority of the overall population of pneumatic controllers and are responsible for the majority of emissions from these sources. We are proposing to define an intermittent vent natural gas-driven pneumatic controller as a pneumatic controller that is not designed to have a continuous bleed rate but is instead designed to only release natural gas to the atmosphere as part of the actuation cycle. This affected facility definition would apply at all sites, including natural gas processing plants.

Second, we are proposing a requirement that all controllers (continuous bleed and intermittent vent) must have a VOC and methane emission rate of zero. The proposed rule does not specify how this emission rate of zero must be achieved, but a variety of viable options are discussed in Section XII.C. including the use of pneumatic controllers that are not driven by natural gas such as air-driven pneumatic controllers and electric controllers, as well as natural gas driven controllers that are designed so that there are no emissions, such as self-contained pneumatic controllers. As noted above, the EPA is proposing that the definition of an affected facility would be each pneumatic controller that is driven by natural gas and that emits to the atmosphere. As such, pneumatic controllers that are not driven by natural gas would not be affected facilities, and thus would not be subject to the pneumatic controller requirements of NSPS OOOOb. Similarly, controllers that are driven by natural gas but that do not emit to the atmosphere would also not be affected facilities. In order to demonstrate that a particular

pneumatic controller is not an affected facility, owners and operators should maintain documentation to show that such controllers are not natural gas driven such as documentation of the design of the system, and to ensure that they are operated in accordance with the design so that there are no emissions.

In both NSPS OOOO and OOOOa, there is an exemption from the standards in cases where the use of a pneumatic controller affected facility with a bleed rate greater than the applicable standard is required based on functional needs, including but not limited to response time, safety, and positive actuation. The EPA is not maintaining this exemption in the proposed NSPS OOOOb, except for in very limited circumstances explained in section XII.C. As discussed in section XII.C., the reasons to allow for an exemption based on functional need in NSPS OOOO and OOOOa were based on the inability of a low-bleed controller to meet the functional requirements of an owner/operator such that a high-bleed controller would be required in certain instances. Since we are now proposing that pneumatic controllers have a methane and VOC emission rate of zero, we do not believe that the reasons related to the use of low bleed controllers are still applicable. However, EPA is soliciting comment on whether owners/operators believe that maintaining such an exemption based on functional need is appropriate, and if so why.

The proposed rule includes an exemption from the zero-emission requirement for pneumatic controllers in Alaska at locations where power is not available. In these situations, the proposed standards require the use of a low-bleed controller instead of high-bleed controller. Further, in these situations (controllers in Alaska at location without power) the proposed rule includes the exemption that would allow the use of high-bleed controllers instead of low-bleed

based on functional needs. Lastly, in these situations owners/operators must inspect intermittent vent controllers to ensure they are not venting during idle periods.

2. EG OOOOc

In this action, the EPA is proposing to define designated facilities (existing sources) analogous to the affected facility definitions described above for pneumatic controllers under the NSPS. For the reasons discussed in section XII.C.2, the BSER analysis for existing sources supports proposing presumptive standards for reducing methane emissions from existing pneumatic controllers that are the same as those the EPA is proposing for new, modified, or reconstructed sources (for NSPS OOOOb).

D. Well Liquids Unloading Operations

Well liquids unloading operations, which are currently unregulated under the NSPS OOOOa, refer to unloading of liquids that have accumulated over time in gas wells and are impeding or halting production. The EPA is proposing standards in the NSPS OOOOb to reduce methane and VOC emissions during liquids unloading operations.

1. NSPS OOOOb

We are proposing standards to reduce VOC and methane emissions from each well that conducts a liquids unloading operation. Based on our analysis, which is summarized in section XII.D.1, we are proposing a standard under NSPS OOOOb that requires owners or operators to perform liquids unloading with zero methane or VOC emissions. In the event that it is technically infeasible or not safe to perform liquids unloading with zero emissions, the EPA is proposing to require that an owner or operator establish and follow BMPs to minimize methane and VOC emissions during liquids unloading events to the extent possible.

The EPA is co-proposing two regulatory approach options to implement the rule requirements.

For Option 1, the affected facility would be defined as every well that undergoes liquids unloading. This would mean that wells that utilize a non-emitting method for liquids unloading would be affected facilities and subject to certain reporting and recordkeeping requirements. These requirements would include records of the number of unloadings that occur and the method used. A summary of this information would also be required to be reported in the annual report. The EPA also recognizes that under some circumstances venting could occur when a selected liquids unloading method that is designed to not vent to the atmosphere is not properly applied (*e.g.*, a technology malfunction or operator error). Under the proposed rule Option 1 owners and operators in this situation would be required to record and report these instances, as well as document and report the length of venting, and what actions were taken to minimize venting to the maximum extent possible.

For wells that utilize methods that vent to the atmosphere, the proposed rule would require that owners or operators (1) Document why it is infeasible to utilize a non-emitting method due to technical, safety, or economic reasons; (2) develop BMPs that ensure that emissions during liquids unloading are minimized including, at a minimum, having a person on-site during the liquids unloading event to expeditiously end the venting when the liquids have been removed; (3) follow the BMPs during each liquids unloading event and maintain records demonstrating they were followed; and (4) report the number of liquids unloading events in an annual report, as well as the unloading events when the BMP was not followed. While the proposed rule would not dictate all of the specific practices that must be included, it would

specify minimum acceptance criteria required for the types and nature of the practices. Examples of the types and nature of the required practice elements are provided in XII.D.1.e.

For Option 2, the affected facility would be defined as every well that undergoes liquids unloading using a method that is not designed to totally eliminate venting. The significant difference in this option is that wells that utilize non-venting methods would not be affected facilities that are subject to the NSPS OOOOb. Therefore, they would not have requirements other than to maintain records to document that they used non-venting liquids unloading methods. The requirements for wells that use methods that vent would be the same as described above under Option 1. The EPA solicits comment on including information such as where the well stream was directed during unloading and emissions manifested and whether an estimate of the VOC and methane emissions generated should be included in the annual report.

There are several techniques owners and operators can choose from to unload liquids, including manual unloading, velocity tubing or velocity strings, beam or rod pumps, electric submergence pumps, intermittent unloading, gas lift (*e.g.*, use of a plunger lift), foam agents, wellhead compression, and routing the gas to a sales line or back to a process. Although the unloading method employed by an owner or operator can itself be a method that can be employed in such a way that mitigates/eliminates venting of emissions from a liquids unloading event, indicating a particular method to meet a particular well's unloading needs is a production engineering decision. Based on available information, liquids unloading operations are often conducted in such a way that eliminates venting to the atmosphere and there are many options that include techniques and procedures that an owner or operator can choose from to achieve this standard (discussed in section XII.D.e of this preamble).

However, the EPA recognizes that there may be reasons that a non-venting method is infeasible for a particular well, and the proposed rule would allow for the use of BMPs to reduce the emissions to the maximum extent possible for such cases (discussed in section XII.D of this preamble). BMPs include, but are not limited to, following specific steps that create a differential pressure to minimize the need to vent a well to unload liquids and reducing wellbore pressure as much as possible prior to opening to atmosphere via storage tank, unloading through the separator where feasible, and requiring an operator to remain on-site throughout the unloading, and closure of all well head vents to the atmosphere and return of the well to production as soon as practicable. For example, where a plunger lift is used, the plunger lift can be operated so that the plunger returns to the top and the liquids and gas flow to the separator. Under this scenario, venting of the gas can be minimized and the gas that flows through the separator can be routed to sales. In situations where production engineers select an unloading technique that vents emissions or has the potential to vent emissions to the atmosphere, owners and operators already often implement BMPs in order to increase gas sales and reduce emissions and waste during these (often manual) liquids unloading activities.

2. EG OOOOc

The EPA has determined that each well liquids unloading event represents a modification, which will make the well subject to new source standards under the NSPS for purposes of the liquids unloading standards.[203] Therefore, after the effective date of NSPS OOOOb, the first time a well undergoes liquids unloading it will become subject to NSPS

[203] To clarify further, when a well liquids unloading event represents a modification, this does not make the whole well site a new source. Rather, the modification will make the well subject to NSPS for only the liquids unloading standards.

OOOOb. This will mean that there will never be a well that undergoes liquids unloading that will be existing. Therefore, we are not proposing presumptive standards under the subpart OOOOc EG.

E. Reciprocating Compressors

1. NSPS OOOOb

The current NSPS in OOOOa for reducing VOC and methane emissions from reciprocating compressors is to replace the rod packing on or before 26,000 hours of operation or 36 calendar months, or to route emissions from the rod packing to a process through a closed vent system under negative pressure. The affected facility is each reciprocating compressor, with the exception of reciprocating compressors located at well sites. Based on the analysis in section XII.E.1, the proposed BSER for reducing GHGs and VOC from new reciprocating compressors is replacement of the rod packing based on an annual monitoring threshold. Under this proposal for the NSPS, we would continue to retain, as an alternative, the option of routing rod packing emissions to a process via a closed vent system under negative pressure. In this proposed updated standard, the owner or operator of a reciprocating compressor affected facility would be required to monitor the rod packing emissions annually using a flow measurement. When the measured leak rate exceeds 2 scfm (in pressurized mode), replacement of the rod packing would be required.

As mentioned above, reciprocating compressors that are located at well sites are not affected facilities under the 2016 NSPS OOOOa. The EPA previously excluded them because we found the cost of control to be unreasonable. 81 FR 35878 (June 3, 2016). Our current analysis, as summarized in section XII.E.1, continues to support this exclusion for a subset of well sites so

this proposal for NSPS OOOOb includes that same exclusion for well sites that are not centralized production facilities. See section XI.L for additional details on centralized production facilities. As described in that section, the EPA is proposing to apply the proposed standards to reciprocating compressors located at centralized production facilities.

2. EG OOOOc

Based on the analysis in section XII.E.2, the EPA is proposing EG that include a presumptive GHG standard (in the form of limitation on methane emissions) for existing reciprocating compressors that is the same as the proposed NSPS, including applying these presumptive standards to reciprocating compressors located at existing centralized tank batteries.

F. Centrifugal Compressors

1. NSPS OOOOb

The current NSPS in OOOOa for wet seal centrifugal compressors is 95 percent reduction of GHGs and VOC emissions. The affected facility is each wet seal centrifugal compressor, with the exception of wet seal centrifugal compressors located at well sites. Based on the analysis in section XII.F.1, the BSER for reducing GHGs and VOC from new, reconstructed, or modified wet seal centrifugal compressors is the same as the current standard, which is 95 percent reduction of GHG and VOC emissions. The standard can be achieved by capturing and routing the emissions, using a cover and closed vent system, to a control device that achieves an emission reduction of 95 percent, or by routing captured emissions to a process.

As discussed above, wet seal centrifugal compressors that are located at well sites are not affected facilities under the 2016 NSPS OOOOa. The EPA previously excluded them because data available at the time did not suggest there were a large number of wet seal centrifugal

compressors located at well sites. 81 FR 35878 (June 3, 2016). Our analysis continues to support this exemption for wet seal centrifugal compressors located at well sites that are not centralized production facilities. See section XI.L for additional details on centralized production facilities. As described in that section, the EPA is proposing to apply the proposed standards to centrifugal compressors located at centralized production facilities.

2. EG OOOOc

Based on the analysis in section XII.F.2, the EPA is proposing EG that include a presumptive GHG standard (in the form of limitation on methane emissions) for existing wet seal centrifugal compressors that is the same as the NSPS, including applying these presumptive standards to wet seal centrifugal compressors at existing centralized tank batteries.

G. Pneumatic Pumps

1. NSPS OOOOb

The current NSPS in OOOOa regulates individual natural gas driven diaphragm pneumatic pumps at well sites and at onshore natural gas processing plants. The current NSPS for a natural gas driven diaphragm pneumatic pump at well sites requires 95 percent control of GHGs and VOCs if there is an existing control device or process on site where emissions can be routed. There are two exceptions to the 95 percent control requirement: (1) The existing control or process achieves less than 95 percent reduction; or (2) it is technically infeasible to route to the existing control device or process. In addition, the current NSPS in OOOOa specifies that boilers and process heaters are not considered control devices and that routing emissions from pneumatic pump discharges to boilers and process heaters is not considered routing to a process. For more discussion on the use of boilers and process heaters as control devices for pneumatic

pump emissions, see section X.B.2 of this preamble. The current NSPS for a natural gas driven diaphragm pneumatic pump at an onshore natural gas processing plant is a natural gas emission rate of zero, based on natural gas as a surrogate for VOC and GHG, the two regulated pollutants.

For NSPS OOOOb, we are proposing to expand the applicability of the standard currently in NSPS OOOOa in two ways. The first is by including all natural gas driven diaphragm pumps as affected facilities in the transmission and storage segment in addition to the production and natural gas processing segments. The second is that we are expanding the affected facility definition to include natural gas driven piston pumps in addition to diaphragm pumps. The proposed definition of an affected facility would continue to exclude lean glycol circulation pumps that rely on energy exchange with the rich glycol from the contractor.

Based on our analysis, which is summarized in section XII.G.1, we are proposing to retain the current standard for a natural gas driven diaphragm pneumatic pump at well sites because the BSER for reducing VOC and methane emissions from such pumps at a well site continues to be routing to a combustion device or process, but only if the control device or process is already available on site. As before, the current analysis continues to show that it is not cost-effective to require the owner or operator of a pneumatic pump to install a new control device or process onsite to capture emissions solely for this purpose. Moreover, even where a control device or process is available onsite that would achieve at least 95 percent control, the EPA is aware that it may not be technically feasible in some instances to route the pneumatic pump to the control device or process. In this situation, the proposed rule would exempt the owner and operator from this requirement provided that they document the technical infeasibility and submit it in an annual report. Another circumstance is that it may be feasible to route the

emissions to a control device, but the control cannot achieve 95 percent control. In this instance, the proposed rule would exempt the owner or operator from the 95 percent requirement, provided that the owner or operator maintain records demonstrating the percentage reduction that the control device is designed to achieve. In this way, the standard would achieve emission reductions with regard to pneumatic pump affected facilities even if the only available control device cannot achieve a 95 percent reduction. For more discussion of the technical infeasibility aspects of the pneumatic pump requirements, see section X.B.2 of this preamble. We are proposing to expand these requirements to all diaphragm pumps at all sites in the production segment, as well as at all transmission and storage sites. In addition, we are proposing that these requirements would also include emissions from piston pneumatic pumps at all sites in the production segment.

We are not proposing any change to the current standard of zero natural gas emission for natural gas driven diaphragm pneumatic pumps located at onshore natural gas processing plants, other than the expansion of the affected facility definition to include piston pumps. Our analysis discussed in section XII.G.1 demonstrates this standard is the BSER.

2. EG OOOOc

The EPA is proposing EG that include presumptive methane standards that are the same as described above for the NSPS OOOOb for existing natural gas driven diaphragm pneumatic pumps located at well sites and all other sites in the production segment (except processing plants) and transmission and storage segment where an existing control device exists. However, unlike the proposed methane standards in NSPS OOOOb for natural gas driven piston pneumatic pumps at sites in the production segment, the proposed presumptive standards under EG OOOOc

exclude piston pumps from the 95 percent control requirements. The EPA's proposed emissions guidelines also include a presumptive methane standard for pneumatic pumps located at onshore natural gas processing plants that is the same as the proposed NSPS described above.

H. Equipment Leaks at Natural Gas Processing Plants

Based on our analysis, which is summarized in section XII.H.1, the EPA is proposing to update the NSPS for reducing VOC and methane emissions from equipment leaks at onshore natural gas processing plants. Further, based on the same analysis in section XII.H.1 and the EPA's understanding that it is appropriate to apply that same analysis to existing sources, the EPA is also proposing EG that include these same LDAR requirements as presumptive standards for reducing methane leaks from existing equipment at onshore natural gas processing plants.

The EPA is proposing to expand the definition of an affected facility (referred to as a "equipment within a process unit") and establish a new standard for reducing equipment leaks of VOC and methane emissions from new, modified, and reconstructed process units at onshore natural gas processing plants. This proposed standard would require (1) the use of OGI monitoring to detect equipment leaks from pumps, valves, and connectors, and (2) retain the current requirements in the 2016 NSPS OOOOa (which incorporates by reference specific provisions of 40 CFR part 60, subpart VVa ("NSPS VVa")) for PRDs, open-ended valves or lines, and closed vent systems and equipment designated with no detectable emissions.

First, we are proposing to remove a threshold that excludes certain equipment within a process unit from being subject to the equipment leaks standards for onshore natural gas processing plants. While the current definition of an affected facility includes all equipment, except compressors, that is in contact with a process fluid containing methane or VOCs (*i.e.,*

each pump, PRD, open-ended valve or line, valve, and flange or other connector), the standards apply only to equipment "in VOC service," which "means the piece of equipment contains or contacts a process fluid that is at least 10 percent VOC by weight." We are proposing to remove this VOC concentration threshold from the LDAR requirements for the following reasons. First, a VOC concentration threshold bears no relationship to the LDAR for methane and is therefore not an appropriate threshold for determining whether LDAR for methane applies. Second, since there would be no threshold for requiring LDAR for methane, any equipment not in VOC service would still be required to conduct LDAR for methane even if not for VOC, thus rendering this VOC concentration threshold irrelevant.

Second, for all pumps, valves, and connectors located within an affected process unit at an onshore natural gas processing plant, we are proposing to require the use of OGI to identify leaks from this equipment on a bimonthly frequency (*i.e.,* once every other month), which according to our analysis is the BSER for identifying and reducing leaks from this equipment. OGI monitoring would be conducted in accordance with the proposed Appendix K,[204] which is included in this action and outlines the proposed procedures that must be followed to identify leaks using OGI. As an alternative to bimonthly monitoring using OGI, we are proposing to allow affected facilities the option to comply with the requirements of NSPS VVa, which are the current requirements in the 2016 NSPS OOOOa.[205] As explained in XII.A, our analysis shows

[204] "*Determination of Volatile Organic Compound and Greenhouse Gas Leaks Using Optical Gas Imaging*" located at Docket ID No. EPA-HQ-OAR-2021-0317.

[205] It is important to note that the stay of the connector monitoring requirements in 40 CFR 60.482-11a does not apply to connectors located at onshore natural gas processing plants. Therefore, where sources choose to comply with the requirements of NSPS VVa in place of the proposed OGI requirements, the standards in 40 CFR 60.482-11a are applicable to all connectors in the process unit.

that the proposed standards, which use OGI, achieve equivalent reduction of VOC and methane emissions as the current standards, which are based on EPA Method 21, but at a lower cost. While we no longer consider EPA Method 21 to be the BSER for reducing methane and VOC emissions from equipment leaks at onshore natural gas processing plants, we are retaining NSPS VVa as an alternative for owners and operators who prefer using EPA Method 21.

Third, we are proposing to require a first attempt at repair for all leaks identified with OGI within 5 days of detection, and final repair completed within 15 days of detection. We are also proposing definitions for "first attempt at repair" and "repaired." The proposed definitions would apply to the equipment leaks standards at natural gas processing plants as well as to fugitive emissions requirements at well sites and compressor stations. The proposed definition of "first attempt at repair" is "an action taken for the purpose of stopping or reducing fugitive emissions or equipment leaks to the atmosphere. First attempts at repair include, but are not limited to, the following practices where practicable and appropriate: Tightening bonnet bolts; replacing bonnet bolts; tightening packing gland nuts; or injecting lubricant into lubricated packing." The proposed definition for "repaired" is "fugitive emissions components or equipment are adjusted, replaced, or otherwise altered, in order to eliminate fugitive emissions or equipment leaks as defined in this subpart and resurveyed to verify that emissions from the fugitive emissions components or equipment are below the applicable leak definition." Repairs can include replacement with low-emissions ("low-e") valves or valve packing, where commercially available, as well as drill-and-tap with a low-e injectable. These low-e equipment meet the specifications of API 622 or 624. Generally, a low-e valve or valve packing product will include a manufacturer written warranty that it will not emit fugitive emissions at a

concentration greater than 100 ppm within the first five years. Further, we are proposing to incorporate the delay of repair provisions that are in 40 CFR 60.482-9a of NSPS VVa (and incorporated into NSPS OOOOa). These provisions would allow the delay of repairs where it is technically infeasible to complete repairs within 15 days without a process unit shutdown and require repair completion before the end of the next process unit shutdown.

Fourth, we are proposing to retain the current requirements in NSPS OOOOa for open-ended valves or lines, closed vent systems and equipment designated with no detectable emissions, and PRDs. For open-ended valves or lines, we propose to retain the requirements in 40 CFR 60.482-6a of NSPS VVa. Specifically, we are proposing that each open-ended valve or line in a new or existing process unit must be equipped with a closure device (*i.e.,* cap, blind flange, plug, or a second valve) that seals the open end at all times except during operations requiring process fluid flow through the open-ended valve or line. The EPA is soliciting comment on requiring OGI monitoring (or EPA Method 21 monitoring for those opting for that alternative) on these open-ended valves or lines equipped with closure devices to ensure no emissions are going to the atmosphere. Specifically, the EPA is soliciting information that would aid in determining what additional costs would be incurred from either OGI or EPA Method 21 monitoring and repair of leaking open-ended valves or lines, and information on leak rates and concentrations of emissions, where monitoring has been performed.

While the EPA is proposing to retain the no detectable emission requirement in NSPS OOOOa for closed vent systems and equipment designated as having no detectable emissions (*e.g.,* valves or PRDs), the EPA is also soliciting comment on whether bimonthly OGI monitoring according to the proposed Appendix K is appropriate to demonstrate compliance with

this requirement. The current NSPS requires the closed vent systems[206] and the other equipment described above to operate with no detectable emissions, as demonstrated by an instrument reading of less than 500 ppm above background with EPA Method 21. On December 22, 2008, the EPA issued a final rule titled, "*Alternative Work Practice to Detect Leaks from Equipment" (AWP)*.[207] In that final rule, the EPA did not permit the use of OGI for this equipment, stating, "the AWP is not appropriate for monitoring closed vent system, leakless equipment, or equipment designated as non-leaking. While the AWP will identify leaks with larger mass emission rates, tests conducted with both the AWP and the current work practice indicate the AWP, at this time, does not identify very small leaks and may not be able to identify if non-leaking/leakless equipment are truly nonleaking because the detection sensitivity of the optical gas imaging instrument is not sufficient." 73 FR 78204 (December 22, 2008). The EPA is soliciting information that would support the use of OGI for closed vent systems and equipment designated with no detectable emissions at new and existing process units, including comment on applying the proposed bimonthly OGI monitoring requirement on this equipment in place of the NSPS VVa annual EPA Method 21 monitoring.

Finally, the EPA is proposing to retain the emission standards for PRDs found in 40 CFR 60.482-4a of NSPS VVa. This provision requires that PRDs be operated with no detectable emissions, except during pressure releases at new and existing process units. As stated above, the

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[206] For purposes of this standard, the EPA is referring to closed vent systems used equipment within process units at onshore natural gas processing plants. Closed vent systems associated with controlled storage vessels, wet seal centrifugal compressors, reciprocating compressors and pneumatic pumps are not included in this discussion and would demonstrate compliance with the no detectable emissions standard by EPA Method 21 (except for storage vessels), monthly AVO, or OGI monitoring during the fugitive emissions survey.

[207] See 73 FR 78199 (December 22, 2008).

EPA is soliciting comment on the use of OGI to demonstrate that PRDs are meeting this operational emission standard.

2. EG OOOOc

The EPA is proposing EG that include a presumptive methane standard that is the same as described above for the NSPS OOOOb for equipment leaks at existing onshore natural gas processing plants. Based on the analysis in section XII.H.2, the BSER for reducing GHGs from equipment leaks at new and existing onshore natural gas processing plants are the same.

I. Well Completions

Based on our understanding that there are no advances in technologies or practices, which is summarized in section XII.I, the EPA is proposing to retain the REC and completion combustion requirements for reducing methane and VOC emissions from well completions of hydraulically fractured or refractured oil and natural gas wells, as they continue to reflect the BSER. s. These proposed standards are the same as those for natural gas and oil wells regulated in the 2012 NSPS OOOO and 2016 NSPS OOOOa, as amended in the 2020 Technical Rule for VOC and proposed in section X.B.1 for methane.[208] Because of the nature of well completions, any completion (or recompletion) is considered a new or modified well affected facility, therefore, the EPA does not believe there are existing well affected facilities to which a EG OOOOc presumptive standard for well completions would apply.

J. Oil Wells with Associated Gas

Associated gas originates at wellheads that also produce hydrocarbon liquids and occurs

[208] See Docket ID No. EPA-HQ-OAR-2021-0317 for proposed redline regulatory text for 40 CFR 60.5375a as a reference for the specific well completion standards proposed for NSPS OOOOb.

either in a discrete gaseous phase at the wellhead or is released from the liquid hydrocarbon phase by separation. There are no current NSPS requirements for this emission source. The EPA is proposing standards in the NSPS OOOOb to reduce methane and VOC emissions resulting from the venting of associated gas from oil wells.

1. NSPS OOOOb

We are proposing standards to reduce methane and VOC emissions from each oil well that produces associated gas. Based on our analysis, which is summarized in section XII.J, we are proposing a standard under NSPS OOOOb that requires owners or operators of oil wells to route associated gas to a sales line. In the event that access to a sales line is not available, we are proposing that the gas can be used as an onsite fuel source, used for another useful purpose that a purchased fuel or raw material would serve, or routed to a flare or other control device that achieves at least 95 percent reduction in methane and VOC emissions. As discussed in section XII.J, the EPA is soliciting comment on how "access to a sales line" should be defined. An affected facility would be defined as any oil well that produces associated gas. The proposed rule would require that when using a flare, the flare must meet the requirements in 40 C.F.R. 60.18 and that monitoring, recordkeeping, and reporting be conducted to ensure that the flare is constantly achieving the required 95 percent reduction. As discussed in section XII.J, the EPA is soliciting comment on an alternative affected facility definition that would exclude oil wells that route all associated gas to a sales line. The EPA is also soliciting comment and information that would support requirements using other strategies to reduce venting and flaring of associated gas from oil wells. The EPA is specifically requesting comment on whether the proposed requirements will incentivize the sale or productive use of captured gas, and if not, other

methods that the EPA could use to incentivize or require the sale or productive use instead of flaring.

2. EG OOOOc

The EPA is proposing presumptive standards for existing oil wells in this action that are the same as discussed above for new sources.

K. Sweetening Units

Based on our understanding that no advances in technologies or practices are available to reduce SO_2 emissions from sweetening units, as described in section XII.K, the EPA is proposing to retain the standards as it continues to reflect the BSER. These proposed standards are the same as those for sweetening units regulated in the 2016 NSPS OOOOa, and as amended in the 2020 Technical Rule.[209]

L. Centralized Production Facilities

The EPA is also proposing a new definition for "centralized production facility," which is "one or more permanent storage tanks and all equipment at a single stationary source used to gather, for the purpose of sale or processing to sell, crude oil, condensate, produced water, or intermediate hydrocarbon liquid from one or more offsite natural gas or oil production wells. This equipment includes, but is not limited to, equipment used for storage, separation, treating, dehydration, artificial lift, combustion, compression, pumping, metering, monitoring, and flowline. Process vessels and process tanks are not considered storage vessels or storage tanks. A centralized production facility is located upstream of the natural gas processing plant or the crude

[209] See Docket ID No. EPA-HQ-OAR-2021-0317 for proposed redline regulatory text for 40 CFR 60.5375a as a reference for the specific well completion standards proposed for NSPS OOOOb.

oil pipeline breakout station and is a part of producing operations." The EPA is proposing this definition to (1) specify how the fugitive emissions requirement apply to centralized production facilities, (2) specify how exemptions related to 40 CFR part 60, subparts K, Ka, or Kb ("NSPS Kb) may apply, and (3) specify what standards would apply to reciprocating and centrifugal compressors located at these facilities.

First, the EPA is proposing to specify how the fugitive emission requirements apply to centralized production facilities. The 2016 NSPS OOOOa, as originally promulgated, provided that "[f]or purposes of the fugitive emissions standards at 40 CFR 60.5397a, [a] well site also means a separate tank battery surface site collecting crude oil, condensate, intermediate hydrocarbon liquids, or produced water from wells not located at the well site (*e.g.,* centralized tank batteries)." 40 CFR 60.5430a. The inclusion of centralized tank batteries in the definition of well site was used to clarify the boundary of a well site for purposes of the fugitive emissions requirements. Further, in the RTC[210] for the 2016 NSPS OOOOa we stated, "[o]ur intent is to limit the oil and gas production segment up to the point of custody transfer to an oil and natural gas mainline pipeline (including transmission pipelines) or a natural gas processing plant. Therefore, the collection of fugitive emissions components within this boundary are a part of the well site." The EPA continues to define these facilities as a type of well site but is proposing a separate definition to provide further clarity, especially as it relates to when these facilities are modified, and thus become subject to the fugitive emissions requirements in NSPS OOOOb. The EPA has determined it is appropriate to rename this site as a centralized production facility and to provide the specific definition above to avoid confusion with the storage vessel affected

[210] See Document ID No. EPA-HQ-OAR-2010-0505-7632 at page 4-194.

facility, of which applicability is determined for a tank battery, and to better specify the facility name based on the basic function the site performs (*i.e.,* production operations).

Second, the EPA has received questions related to whether NSPS Kb would apply to the storage vessels at centralized production facilities. There is an exemption in NSPS Kb for storage vessels in the producing operations that are below a specific size. Specifically, 40 CFR 60.110(b)(4) exempts "vessels with a design capacity less than or equal to 1,589.874 m^3 used for petroleum or condensate stored, processed, or treated prior to custody transfer." This exemption is a revision of an exemption originally promulgated in 40 CFR part 60, subpart K ("NSPS K"). NSPS K "does not apply to storage vessels for the crude petroleum or condensate stored, processed, and/or treated at a drilling and production facility prior to custody transfer." 40 CFR 60.110(b). In that final rule the EPA explained that, "[t]he storage of crude oil and condensate at producing fields is specifically exempted from the standard." 39 FR 9312 (March 8, 1974). While "producing fields" were not explicitly defined, NSPS K defined the terms "custody transfer" and "drilling and production facility". For purposes of NSPS K, custody transfer means "the transfer of produced crude petroleum and/or condensate, after processing and/or treating in the producing operations, from storage tanks or automatic transfer facilities to pipelines or any other forms of transportation." 40 CFR 60.111(g). Drilling and production facility means "all drilling and servicing equipment, wells, flow lines, separators, equipment, gathering lines, and auxiliary nontransportation-related equipment used in the production of crude petroleum but does not include natural gasoline plants." 40 CFR 60.111(h). The definition of "custody transfer" was later also incorporated into 40 CFR part 60, subpart Ka ("NSPS Ka"), NSPS Kb, and 40 CFR part 63, subpart HH (National Emission Standards for Hazardous Air Pollutants from Oil

and Natural Gas Production Facilities).

Instead of a categorical exemption for storage vessels located at drilling and production facilities, NSPS Ka, and subsequently NSPS Kb, adopted threshold-based exemptions that are based on the capacity of an individual storage vessel used to store petroleum (crude oil) or condensate prior to custody transfer. In NSPS Ka, the EPA stated "[t]his exemption applies to storage between the time that the petroleum liquid is removed from the ground and the time that custody of the petroleum liquid is transferred from the well or producing operations to the transportation operations" 45 FR 23377 (April 4, 1980). In NSPS Kb, the EPA further stated that "[t]he promulgated standards for petroleum liquid storage vessels specifically exempted vessels with a capacity less than 420,000 gallons and storing petroleum (crude oil) and condensate prior to custody transfer (production vessels). The emission controls that are applicable to the storage vessels included in the standards being proposed are not applicable to production vessels." 49 FR 29701.

The EPA finds it inappropriate to use the controls required by NSPS K, Ka, and Kb on storage vessels located in the production segment, especially where flash emissions are prevalent. Specifically, the NSPS K, Ka, and Kb control requirements include provisions allowing the use of floating roofs to reduce emissions from storage tanks. Floating roofs are not designed to store liquid (or gases) under pressure. Pressurized liquid sent to a storage vessel from a well or separator or other process that operates above atmospheric pressure may contain dissolved gases. These gases will be released or "flash" from the liquid as the fluid comes to equilibrium with atmospheric pressure within the storage vessel. The flash gas will either be released from gaps in the seal system or from "rim vents" on the floating roof. The rim vent may

be an open tube or may be fitted with a low-pressure relief valve, but it is specifically designed to allow any gas entrained or dissolved in the storage liquid to be released above the floating roof. That is, floating roofs are not designed to prevent the release of flash gas, they are only designed to limit the volatilization of a liquid that occurs when the storage liquid is directly exposed with unsaturated air. Since a significant portion of emissions from storage vessels at well sites or centralized production facilities are from flash gas, floating roofs are much less effective at reducing storage vessel emissions than venting these emissions through a CVS to a control or recovery device.

Further, it is the EPA's understanding that these centralized production facilities carry out the same operations that would be conducted at the individual well sites. Therefore, the EPA is proposing a definition of "centralized production facility" that clearly specifies these facilities are located within the producing operations. Therefore, if all other conditions are met (*i.e.,* vessels with a design capacity less than or equal to 1,589.874 m^3 used for petroleum or condensate stored, processed, or treated prior to custody transfer), storage vessels at these centralized facilities would meet the exemption criteria for NSPS Kb.

Alternatively, the EPA is soliciting comment on whether it would be more appropriate to specify within the proposed NSPS OOOOb and EG OOOOc that storage vessels at well sites and centralized production facilities are subject to the requirements in NSPS OOOOb and EG OOOOc instead of NSPS K, Ka, or Kb. This alternative approach would eliminate the need for sources to determine if the storage vessel meets the exemption criteria specified in those subparts and instead focus on appropriate controls for the storage vessels based on the location and type of emissions likely present (*e.g.,* flash emissions).

Finally, the EPA is now proposing to define centralized production facilities separately from well sites because the number and size of equipment, particularly reciprocating and centrifugal compressors, is larger than standalone well sites which would not be included in the proposed definition of "centralized production facilities" above. In the 2016 NSPS OOOOa, the EPA exempted reciprocating and centrifugal compressors located at well sites from the applicable compressor standards.

Reciprocating compressors that are located at well sites are not affected facilities under the 2016 NSPS OOOOa. The EPA previously excluded them because we found the cost of control to be unreasonable. 81 FR 35878. However, as mentioned above, the EPA believes the definition of "well site" in NSPS OOOOa may cause confusion regarding whether reciprocating compressors located at centralized production facilities are also exempt from the standards. In our current analysis, described in section XII.E, we find it is appropriate to apply the same emission factors to reciprocating compressors located at centralized production facilities as those used for reciprocating compressors at gathering and boosting compressor stations. Given the results of that analysis, the EPA is proposing to apply the proposed NSPS OOOOb and presumptive standards in EG OOOOc to reciprocating compressors located at centralized production facilities. The new definition above is intended to apply the results of the EPA's analysis. We believe that this new definition is necessary in the context of reciprocating compressors to distinguish between these compressors at centralized production facilities where the EPA has determined that the standard should apply, and these compressors at standalone well sites where the EPA has determined that the standard should not apply. See section XII.E for more details of those proposed standards.

Similarly, wet seal centrifugal compressors that are located at well sites are not affected facilities under the 2016 NSPS OOOOa. The EPA previously excluded them because data available at the time did not suggest there were a large number of wet seal centrifugal compressors located at well sites. 81 FR 35878. In our current analysis, described in section XII.F, we find it is appropriate to apply the same emission factors to wet seal centrifugal compressors located at centralized production facilities as those used for these same compressors at gathering and boosting compressor stations. Given the results of that analysis, the EPA is proposing to apply the proposed NSPS OOOOb and presumptive standards in EG OOOOc to wet seal centrifugal compressors located at centralized production facilities. See section XII.F for more details of those proposed standards.

M. Recordkeeping and Reporting

The EPA is proposing to require electronic reporting of performance test reports, annual reports, and semiannual reports through the Compliance and Emissions Data Reporting Interface (CEDRI). (CEDRI can be accessed through the EPA's Central Data Exchange (CDX) at *https://cdx.epa.gov/*.) A description of the electronic data submission process is provided in the memorandum *Electronic Reporting Requirements for New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) Rules*, available in the docket for this action. Performance test results collected using test methods that are supported by the EPA's Electronic Reporting Tool (ERT) as listed on the ERT website[211] at the time of the test would be required to be submitted in the format generated through the use of the ERT or an electronic file consistent with the xml schema on the ERT website, and other

[211] *https://www.epa.gov/electronic-reporting-air-emissions/electronic-reporting-tool-ert*

performance test results would be submitted in portable document format (PDF) using the attachment module of the ERT. For semiannual and annual reports, the owner or operator would be required to use the appropriate spreadsheet template to submit information to CEDRI.

The EPA is also proposing to allow owners and operators the ability to seek extensions for submitting electronic reports for circumstances beyond the control of the facility, *i.e.,* for a possible outage in CDX or CEDRI or for a *force majeure* event, in the time just prior to a report's due date. The EPA is providing these potential extensions to protect owners and operators from noncompliance in cases where they cannot successfully submit a report by the reporting deadline for reasons outside of their control. The decision to accept the claim of needing additional time to report is within the discretion of the Administrator.

Electronic reporting is required in the amended 2016 NSPS OOOOa, and the EPA believes that the electronic submittal of these reports in the proposed NSPS OOOOb will increase the usefulness of the data contained in those reports, is in keeping with current trends in data availability, will further assist in the protection of public health and the environment, and will ultimately result in less burden on the regulated community. Electronic reporting can also eliminate 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. Moreover, electronic reporting is consistent with the EPA's plan[212] to implement EO 13563 and is in

[212] EPA's Final Plan for Periodic Retrospective Reviews, August 2011. Available at: *https://www.regulations.gov/document?D=EPA-HQ-OA-2011-0156-0154.*

keeping with the EPA's agency-wide policy[213] developed in response to the White House's Digital Government Strategy.[214]

In addition to the annual and semiannual reporting requirement, the EPA is soliciting comment on what elements, if any, are appropriate for more frequent reporting, and what mechanism would be appropriate for the collection and public dissemination of this information. For example, it may be appropriate to make information related to large emission events public in a timelier manner than the annual reporting period. Therefore, the EPA is soliciting comment on the appropriate mechanism to use for this type of report, including how the data would be reported, who would manage that reporting system, the frequency at which the data should be reported, the potential benefits of more frequent reporting for reducing emissions, the associated burden with this type of reporting and ways to mitigate that burden, and other considerations that should be taken into account.

N. Prevention of Significant Deterioration and Title V Permitting

The pollutant we are proposing to regulate is GHGs, not methane as a separately regulated pollutant. As explained in section XV of this preamble, we are proposing to add provisions to NSPS OOOOb and EG OOOOc, analogous to what was included in the 2016 NSPS OOOOa and other rules regulating GHGs from electric utility generating units, to make clear in the regulatory text that the pollutant regulated by this rule is GHGs. The proposed addition of

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[213] E-Reporting Policy Statement for EPA Regulations, September 2013. Available at: *https://www.epa.gov/sites/production/files/2016-03/documents/epa-ereporting-policy-statement-2013-09-30.pdf.*

[214] Digital Government: Building a 21st Century Platform to Better Serve the American People, May 2012. Available at: *https://obamawhitehouse.archives.gov/sites/default/files/omb/egov/digital-government/digital-government.html.*

these and other provisions is intended to address some of the potential implications on the CAA Prevention of Significant Deterioration (PSD) preconstruction permit program and the CAA title V operating permit program.

XII. Rationale for Proposed NSPS OOOOb and EG OOOOc

The following sections provide the EPA's BSER analyses and the resulting proposed NSPS to reduce methane and VOC emissions and the resulting proposed EG, which include presumptive standards, to reduce methane emissions from across the Crude Oil and Natural Gas source category. Our general process for evaluating BSER for the emission sources discussed below included: (1) Identification of available control measures; (2) evaluation of these measures to determine emission reductions achieved, associated costs, non-air environmental impacts, energy impacts and any limitations to their application; and (3) selection of the control techniques that represent BSER.[215] As discussed in the 2016 NSPS OOOOa, the available control technologies will reduce both methane and VOC emissions at the same time. The revised BSER analysis we have undertaken for the sources addressed in the proposed NSPS OOOOb continues to support this conclusion. CAA Section 111 also requires the consideration of cost in determining BSER. Section IX describes how the EPA evaluates the cost of control for purposes of this rulemaking. Sections XII.A through XII.I provide the BSER analysis and the resulting proposed NSPS and EG for the individual emission sources contemplated in this action. Please note that there are minor differences in some values presented in various documents supporting

[215] In the context of developing the draft emissions guidelines contained herein, this general process also follows, and is intended to satisfy, certain requirements of EPA's implementing regulations for CAA section 111(d), namely the specific listed component of a draft EG contained in 40 CFR 60.22a(b)(2), and some elements of (b)(3).

this action. This is because some calculations have been performed independently (*e.g.,* NSPS OOOOb and EG OOOOc TSD calculations for NSPS OOOOb and EG OOOOc focused on unit-level cost-effectiveness and RIA calculations focused on national impacts) and include slightly different rounding of intermediate values.

For this proposed EG the EPA is proposing to translate the degree of emission limitation achievable through application of the BSER (*i.e.,* level of stringency) into presumptive standards.[216] As discussed in each of the EG-specific subsections below, the EPA's evaluation of BSER in the context of existing sources utilized much of the same information as our BSER analysis for the NSPS. This is because within the oil and natural gas industry many of the control measures that are available to reduce emissions of methane from existing sources are the same as those control measures available to reduce VOC and methane emissions from new, modified, and reconstructed sources. By extension, many of the methane emission reductions achieved by the available control options, as well as the associated costs, non-air environmental impacts, energy impacts, and limitations to their application, are very similar if not the same for new and existing sources. Any relevant differences between new and existing sources in the context of available control measures or any other factors are discussed in the EG-specific subsections below.

Where the EPA identified relevant distinctions between new and existing sources in the context of evaluating BSER, it was typically regarding the cost of control options. While many factors can cause differences in the cost of control between new and existing sources, the EPA

[216] This is intended to satisfy certain elements of the requirements of EPA's implementing regulations found at 40 CFR 60.22a(b)(3) and (5) with the exception of compliance times which the EPA discusses separately in section XVI.

would like to highlight two general concepts to illustrate how the oil and natural gas industry is unique. These concepts are the "size" of the affected facility and the type of standards. First, affected facilities defined in any given NSPS can range from entire process units to individual pieces of equipment. For affected facilities comprised of an entire process unit, or very large processes or equipment, there can be significant differences between the cost of construction or modification for a new source as compared to the cost of a retrofit required for implementation of a control at an existing source. In the case of a new sources, there can be cost savings associated with the up-front planning for the installation of controls which cannot be achieved at existing sources that must instead retrofit already existing processes or equipment. This is particularly true of controls involving equipment changes or add-on control devices. In contrast, most affected facilities for which the EPA is proposing standards in NSPS OOOOb are more narrowly defined. For example, a pneumatic controller affected facility is generally defined as a single natural gas-driven pneumatic controller, which is a discrete and relatively small piece of equipment in a larger process. Another example is the reciprocating compressor affected facility which is defined as a single reciprocating compressor. As such, the EPA did not identify the same type of cost savings associated with the up-front planning of controls in the oil and gas sector as we might in the context of larger affected facilities. We believe this is one factor that led to costs being very similar for new and existing sources.

Second, with regard to the type of standards, many of the standards proposed for NSPS OOOOb, and the presumptive standards proposed for EG OOOOc, are non-numerical standards, such as work practice standards, that require limited or no significant physical modifications. The EPA found that costs for these non-numerical standards would typically not differ between

new and existing sources because the work practice could be implemented in both contexts without the need to first install or retrofit any equipment. Put another way, a work practice tends to operate in the same manner regardless of whether the site is new or existing, and existing sites typically do not need to take any preliminary steps in order to implement the work practice. For these reasons, many of the proposed presumptive standards for EG OOOOc discussed in the following sections mirror the proposed standards identified based on the BSER analyses for NSPS OOOOb.

A. Proposed Standards for Fugitive Emissions from Well Sites and Compressor Stations

1. NSPS OOOOb

There are many potential sources of fugitive emissions throughout the Crude Oil and Natural Gas Production source category. Fugitive emissions occur when connection points are not fitted properly or when seals and gaskets start to deteriorate. Changes in pressure and mechanical stresses can also cause components or equipment to emit fugitive emissions. Poor maintenance or operating practices, such as improperly reseated pressure relief valves (PRVs) or worn gaskets and springs on thief hatches on controlled storage vessels are also potential causes of fugitive emissions. Additional sources of fugitive emissions include agitator seals, connectors, pump diaphragms, flanges, instruments, meters, open-ended lines, PRDs such as PRVs, pump seals, valves or controlled liquid storage tanks.

In the 2021 GHGI, the methane emissions for 2019 from fugitive emissions in the Crude Oil and Natural Gas source category were 96,000 metric tons methane for petroleum systems and 351,500 metric tons for natural gas systems. These levels represent 6 percent of the total methane emissions estimated from all petroleum systems sources (*i.e.,* exploration through refining) and 5

percent of all methane emissions from natural gas systems (*i.e.,* exploration through distribution). In addition, fugitive emissions may be represented in other categories of the GHGI production segment; for example, a portion of fugitive emissions (as defined in this action) is also expected to be related to fugitive emissions from tank thief hatches, and thief hatches on controlled storage vessels, and those emissions are included in the emissions estimates for storage vessels in the GHGI.

In the 2016 NSPS OOOOa, the EPA promulgated standards to control GHGs (in the form of limitations on methane emissions) and VOC emissions from fugitive emissions components located at well sites and compressor stations. These standards required a fugitive emissions monitoring and repair program, where well sites and compressor stations had to be monitored semiannually and quarterly, respectively.

a. Fugitive Emissions from Well Sites

Oil and natural gas production practices and equipment vary from well site to well site. A well site can serve one well or multiple wells. Some production sites may include only a single wellhead that is extracting oil or natural gas from the ground, while other sites may include multiple wellheads with a number of operations such as production, extraction, recovery, lifting, stabilization, separation and/or treating of petroleum and/or natural gas (including condensate). In addition, the 2016 NSPS OOOOa definition of well site also includes centralized tank batteries for purposes of the fugitive emissions requirements because, like storage vessels at well sites, centralized tank batteries collect crude oil, condensate, intermediate hydrocarbon liquids, or produced water from wells; therefore, "excluding tank batteries not located at the well site could incentivize some owners or operators to place new tank batteries further away from well sites to

make use of such an exemption."[217] The equipment to perform these production operations (including piping and associated components, compressors, generators, separators, storage vessels, and other equipment) has components that may be sources of fugitive emissions. Therefore, the number of components with the potential for fugitive emissions can vary depending on the number of wells and the number of major production and processing equipment at the site. Another factor that impacts the operations at a well site, and the resulting fugitive emissions potential, is the nature of the oil and natural gas being extracted. This can range from well sites that only extract and handle "dry" natural gas to those that extract and handle heavy oil.

In both the 2016 NSPS OOOOa and subsequent amendments in the 2020 Technical Rule, the EPA relied on a model plant approach to estimate emissions from well sites. Model plants were developed to provide a representation of well sites across the spectrum. Separate production-based model plants using component counts to determine baseline emissions were developed. The basic approach used was to assign a number of specific equipment types for each well site model plant and then to estimate the number of components based on assigned numbers of components per equipment type. Primarily, the well site model plants utilized information from the DrillingInfo HPDI® database,[218] the 1996 EPA/GRI Study,[219] EPA's GHG Inventory, and GHGRP subpart W. Fugitive model plants were originally developed for the 2015 NSPS OOOOa proposed rule and evolved over time in response to new information and public

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[217] See Document ID No. EPA-HQ-OAR-2010-0505-7632 at page 4-221.
[218] Drilling Information, Inc. 2014. *DI Desktop.* 2014 Production Information Database.
[219] Gas Research Institute (GRI)/U.S. EPA. *Research and Development, Methane Emissions from the Natural Gas Industry, Volume 8: Equipment Leaks*. June 1996 (EPA-600/R-96-080h).

comments. More information on the history of the model plant development can be found in the 2015 NSPS Proposal TSD,[220] the 2016 NSPS Final TSD,[221] the 2018 NSPS Proposal TSD,[222] and the 2020 NSPS Final TSD.[223]

In this proposal, the EPA is shifting away from using model plants for well sites for the BSER analysis and is instead using an individual site-level emission-calculation approach in order to better characterize and take into account the differences at individual well sites that can lead to a vast range in the magnitude of fugitive emissions, which a model plant cannot do. Provided below is a more detailed explanation of the issues concerning the previous model plant approach, followed by a description of the site-specific baseline emission calculation approach, which is similar to the State of Colorado's LDAR program.

In the 2020 Technical Rule, the EPA created separate model plants to represent fugitive emissions from low production well sites (those producing 15 boe or less per day) and non-low production well sites, as it was generally assumed that low producing sites would have fewer major production and processing equipment and thus lower fugitive emissions. This prior estimate of baseline emissions was calculated using model plant site designs with assumed populations of major production and processing equipment and fixed fugitive emissions component counts. While the estimated baseline emissions from the two model plants differ due to the difference in the assumed populations of major production and processing equipment and fixed fugitive emissions component counts, the estimated baseline emissions were intended to

[220] EPA-HQ-OAR-2010-0505-5021.
[221] EPA-HQ-OAR-2010-0505-7631.
[222] EPA-HQ-OAR-2017-0483-0040.
[223] EPA-HQ-OAR-2017-0483-2290.

represent the baseline emissions for all well sites represented by each model plant. Since that rulemaking, further analysis of existing and new information indicates that there is significant variation in the well characteristics, type of oil and gas products and production levels, gas composition, operations, and types and quantity of equipment at well sites across the U.S. The TSD for this action further describes existing data and new information received since the 2020 Technical Rule that have been evaluated by the EPA to arrive at the conclusion that there is no one-size-fits-all approach to predicting emissions from well sites and that the emissions vary greatly, in ways that bear little correlation to production levels alone. For example, site-level methane emissions data from comprehensive studies sampled across several different regions at numerous well sites, shows a wide range of methane emissions (*i.e.,* ranging from as low as 0 to as high as 1,200 tpy for marginal or low production wells). Additionally, recently obtained ICR data indicate that actual component counts at well sites with equipment could be higher than those estimated by model plants for low and non-low production, *e.g.,* EPA's non-low model plant could be underestimating number of wells, tanks and separators; and similar observations were made for low production based on this data. Contrary to previous general assumptions, information reviewed also shows that it is not necessarily the case that fugitive emissions from sites with lower production have lower emissions than sites with higher production. In fact, it is quite possible that the inverse can be true (*i.e.,* lower producing sites could have higher emissions and inversely, higher producing sites could have lower emissions.) More information can be found in the NSPS OOOOb and EG TSD for this proposal.

Therefore, the EPA has concluded that the previous model plant approach, which was based on two production levels (equal/above or below 15 boe per day) and the estimated

equipment types and numbers associated with each of the two production levels, may not be reflective of the actual baseline fugitive emissions from well sites. Further, the potential for fugitive emissions at any given site is impacted more by the number and type of equipment at the site and maintenance practices, which can vary widely among well sites with low production.[224] Given these limitations in utilizing model plants to analyze fugitive emission reduction programs at well sites with widely varying configurations, operations, and production levels, we find it appropriate to shift away from using model plants and instead rely on the potential fugitive emissions at the individual site in our BSER analysis and resulting proposed standards. Therefore, this new analysis, which is described below, is conducted on this basis.

This site-specific baseline emissions calculation approach is similar to the State of Colorado's LDAR program. The concept is that each site calculates its baseline methane emissions for all the equipment at the site, the number and type of equipment at the well site, the number of fugitive emissions components associated with each piece of equipment, and the site-specific gas composition. The fugitive monitoring frequency would be based on the baseline site-specific methane emissions level calculated based on this information. This calculation is described in detail in section XI.A.2. We believe that this approach will more accurately depict the emissions profile at each individual well site. As a result, the EPA is conducting the BSER analysis based on site-level baseline methane emissions, where the analysis is performed in increments of 1 tpy of site-level baseline methane emissions as discussed more below.

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[224] See *https://pubs.acs.org/doi/10.1021/acs.est.0c02927, https://data.permianmap.org/pages/flaring,* and *https://www.edf.org/sites/default/files/documents/PermianMapMethodology_1.pdf.*

During the rulemaking for the 2016 NSPS OOOOa, the EPA analyzed two options for reducing fugitive methane and VOC emissions at well sites: A fugitive emissions monitoring program based on individual component monitoring using EPA Method 21 for detection combined with repairs and a fugitive emissions monitoring program based on the use of OGI detection combined with repairs. Finding that both methods achieve comparable emission reduction but OGI was more cost effective, the EPA ultimately identified semiannual monitoring of well sites using OGI as the BSER. 81 FR 35856 (June 3, 2016). While there are several new fugitive emissions technologies under development, the EPA needs additional information to fully characterize the cost, availability, and capabilities of these technologies, and they are therefore not being evaluated as potential BSER at this time. However, we are proposing the use of these technologies as an alternative screening method as described in section XI.A.5. For this analysis for both the NSPS and the EG, we re-evaluated the use of OGI as BSER. In the discussion below, we evaluate OGI control options based on varying the frequency of conducting the survey and fugitive emissions repair threshold (*i.e.,* the visible identification of methane or VOC when an OGI instrument is used). For this analysis, we considered biennial, annual, semiannual, quarterly, and monthly survey frequency for well sites.

The regulatory concept for the proposed NSPS OOOOb is that the required frequency of fugitive monitoring would be based on total site baseline methane emissions. At well sites, the composition of gas is predominantly methane (approximately 70 percent on average). Therefore, as shown in our analysis, compared to VOC, methane better reflects the baseline emission level where it is cost effective to regulate both methane and VOC fugitive emissions at well sites. For this reason, we chose to use methane as the threshold for our determination.

For the BSER analyses, we selected for evaluation total site-wide methane emissions increments of 1 tpy of site-level baseline methane emissions ranging from 1 tpy to 50 tpy. The EPA acknowledges that the site-level baseline methane emissions calculated may not account for the presence of large emission events when they occur. However, the EPA has found it inappropriate to apply a factor that assumes every site is experiencing a large emission event annually based on information suggesting that only a small percentage of sites experience these events at any given time.[225]

In 2015, we evaluated the potential emission reductions from the implementation of an OGI monitoring program where we assigned an emission reduction of 40, 60 and 80 percent to annual, semiannual, and quarterly monitoring survey frequencies, respectively. The EPA re-evaluated the control efficiencies under different monitoring frequencies for the 2020 Technical Rule based on comments received on the 2018 proposal and concluded that the assigned control efficiencies described above can be expected from the corresponding monitoring frequencies using OGI.[226] No other information reviewed since that time indicates that the assigned reduction frequencies are different than previously established and the reduction efficiencies are consistent with what current information indicates. In addition, we also evaluated biennial survey frequency for well sites assuming an achievable reduction frequency of 30 percent, and monthly monitoring

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[225] Brandt, A.R., Heath, G.A., Cooley, D. (2016). *Methane Leaks from Natural Gas Systems Follow Extreme Distributions.* Environ. Sci. Technol. 50, 12512, *https://pubs.acs.org/doi/abs/10.1021/acs.est.6b04303*; Zavala-Araiza, D., Alvarez, R., Lyon, D, et al. (2016). *Super-emitters in natural gas infrastructure are caused by abnormal process conditions*. Nat Commun 8, 14012 (2017). *https://www.nature.com/articles/ncomms14012*; Zavala-Araiza, D., Lyon, D., Alvarez, R. et al. (2015). PNAS 112, 15597. *https://www.pnas.org/content/112/51/15597*.

[226] See 85 FR 57412 and section 2.4.1.1 of the 2020 TSD.

where information evaluated indicated monthly OGI monitoring has the potential of reducing emissions up towards 90 percent.

It is worth noting that these calculations are based on the expected reductions from "typical" component equipment leaks that occur with well-maintained sites. The EPA is aware of situations where equipment malfunctions related to equipment components can cause large emission events that are described in detail in section XII.A.5. In these cases, we expect the emission reductions associated with the different monitoring frequencies evaluated would be significantly higher than assumed above and is the reason we solicit comment on the proposed alternative screening program using advanced measurement technologies to identify and quantify large emission sources. Given the intermittent and stochastic nature of large emission events, it is difficult to apply emission factors that predict the probability of a site experiencing these events within any timeframe. As stated above, the EPA finds it inappropriate to apply a factor that assumes every site is experiencing a large emission event annually given the available data. However, we recognize that identifying and stopping these large emission events is a central purpose of the monitoring requirements proposed in this notice, and that quantifying the pollution reduction benefits associated with addressing these large emission events is important to fully capture the benefits and cost-effectiveness of our proposed fugitive emissions monitoring requirements. We also acknowledge there is substantial ongoing research on large emission events that may further inform the EPA's calculations, including the potential to develop factors that take into account a distribution of emissions across well sites and the associated emissions reductions achieved when large emission events are included in the calculation.

We evaluated the costs of a monitoring and repair program under various monitoring

frequencies. For well sites, the capital costs associated with the fugitives monitoring program were estimated to be $1,030 per well site. These capital costs include the cost of developing the fugitive emissions monitoring plan and purchasing or developing a recordkeeping data management system specific to fugitive emissions monitoring and repair. Consistent with the analyses used for the 2016 NSPS OOOOa and 2020 Technical Rule, the EPA assumes that each company will develop a monitoring plan and recordkeeping system that covers a company-defined area, which is assumed to include 22 well sites. This assumption is used because there are several elements of the fugitive monitoring program that are not site-specific. The total company-defined area (22 well site) capital costs are divided evenly to arrive at the $1,030 capital cost per well site estimate.

When evaluating the annual costs of the fugitive emissions monitoring and repair requirements (*i.e.,* monitoring, repair, repair verification, data management licensing fees, recordkeeping, and reporting), the EPA considers costs at the individual site level. Estimates for these costs were updated extensively as part of the 2020 Technical Rule, and the EPA has made further updates for this proposal based on more recent information. With these updates, the estimated annual costs of the fugitive emissions program at well sites are estimated to range from $2,490 for biennial monitoring to $8,140 for monthly monitoring.[227] These total annual costs include annualization of the up-front cost at 7 percent interest rate over 8 years. We note these costs are representative of the average annual costs expected at well sites, where larger sites may

[227] As a comparison, the annualized costs for fugitive emissions monitoring and repair at well sites were estimated to range from $1,900 to $3,500 for annual to quarterly monitoring, respectively, in the 2020 Technical Rule. See 2020 TSD, attachment 5 at Document ID No. EPA-HQ-OAR-2017-0483-2290.

have larger costs associated with longer surveys or potentially more repairs, while smaller sites may experience the opposite with shorter surveys or potentially less repairs. Therefore, we believe the costs developed for well sites are representative of OGI fugitives monitoring program costs and reflect the best information available at this time.

The EPA requests comment on its range of cost estimates for an OGI fugitives monitoring program. The EPA believes that there will be sufficient supply of OGI equipment and available OGI camera operators for industry to conduct all required monitoring, upon the effective date of the NSPS OOOOb and the subsequent implementation of the EG OOOOc. However, the EPA requests additional information on this capacity and whether there is a likelihood of shortages in the early years of the program that might raise costs. The EPA is also requesting comment on the proposed Appendix K and whether the proposed training, certification, and audit provisions are appropriate and do not place undue burden on the ability of industry to satisfy the regulatory requirements.

At well sites, there are savings associated with the gas not being released. The value of the natural gas saved is assumed to be $3.13 per Mcf of recovered gas. Annual costs were also calculated considering these savings.

As discussed in section XI.C, natural gas-driven intermittent pneumatic controllers are designed to vent during actuation only, but these devices are known to malfunction and operate incorrectly, which causes them to release natural gas to the atmosphere when idle. The EPA is proposing a zero VOC and methane emissions standard for natural gas-driven intermittent pneumatic controllers. However, for sites in Alaska located in the production segment (well sites, gathering and boosting stations, and centralized tank batteries) and in the transmission and

storage segment that do not have electricity, the EPA is proposing a standard wherein intermittent natural gas-driven pneumatic controllers only vent during actuation and not when idle. See section XII.C on pneumatic controllers for a full explanation of this standard. While these intermittent controllers are their own separate affected facility, we are proposing that they be monitored in conjunction with the fugitive emissions components located at the same well site to verify proper actuation and that venting does not occur during idle times.

We created a matrix that includes, for each site-wide methane emission level, the capital (up front) cost, annual costs (with and without the consideration of savings), emission reductions for methane and VOC, and cost effectiveness (dollar per tons of emission reduction). Cost effectiveness was calculated using two approaches; the single pollutant approach where all the costs are assigned to the reduction of one pollutant; and the multipollutant approach, where half the costs are assigned to the methane reduction and half to the VOC reduction, see discussion in preamble section IX. This was repeated for each site-wide methane emissions level for each monitoring frequency. There were several trends shown in this matrix. As noted above, the annual cost for each individual monitoring frequency is applied to all site-wide emission levels when evaluating that frequency. Therefore, as the emissions (and potential emission reductions) increased, the fugitive emissions monitoring became more cost-effective. For example, for semiannual monitoring, the cost effectiveness ranged from $5,300 per ton of methane reduced (for a 1 tpy site-wide methane site) to $100 per ton (for a 50 tpy site-wide methane site). Also, because the emission reduction increase was greater than the cost increase with increasing monitoring frequency, the fugitive emissions monitoring became more cost-effective with increasing monitoring frequency. For example, for a 10 tpy site-wide methane site,

the methane cost effectiveness for annual monitoring was $750 per ton, $530 per ton for semiannual monitoring, and $525 per ton for quarterly monitoring. This trend did not extend to monthly monitoring, as the cost of monthly monitoring increases significantly (almost double) compared to quarterly monitoring, while the emission reduction only increased by 10 percent. The complete matrix is available in the NSPS OOOOb and EG TSD for this rulemaking.

The matrix shows that, on a multipollutant basis, both semiannual and quarterly monitoring at well sites with baseline emissions as low as 2 tpy is cost-effective, and that at 3 tpy, both semiannual and quarterly monitoring are cost-effective based on the methane emissions alone. Cost-effectiveness, however, is not the only relevant factor in setting the BSER, particularly for a source as numerous and diverse as well sites. We estimate that there will be approximately 21,000 new wells each year (and 410,000 existing wells) to which the proposed fugitive emissions requirements will apply.[228] Various studies demonstrate that the vast majority of emissions come from a relatively small subset of wells.[229,230] The EPA would like to ensure that resources and effort are focused on those wells that emit the most methane and VOC. Moreover, given the diversity of ownership, while our cost assumption that distributes the costs

[228] Estimated well counts are based on non-wellhead only sites. Based on information provided by API, we assume that 27% of sites are wellhead only; see Memoranda for Meetings with the American Petroleum Institute (API), September 23, 2021, located at Docket ID No. EPA–HQ–OAR–2021–0317. Absent additional information, we also assume that 27% of wells are wellhead only. The estimated new well count reflects the arithmetic average of well counts over the analysis horizon in the RIA, 2023–2035. The estimated existing well count reflects the total in 2026, which is the first year that we estimate impacts for the emissions guidelines.
[229] Brandt, A., Heath, G., Cooley, D. (2016) *Methane leaks from natural gas systems follow extreme distributions*. Environ. Sci. Technol., DOI: 10.1021/acs.est.6b04303.
[230] Zavala-Araiza, D., Alvarez, R., Lyon, D, et al. (2016). *Super-emitters in natural gas infrastructure are caused by abnormal process conditions*. Nat Commun 8, 14012 (2017). *https://www.nature.com/articles/ncomms14012*.

of recordkeeping evenly across 22 sites within a company-defined area is a reasonable estimate for the population as a whole, it may underestimate the costs and therefore overestimate the cost-effectiveness for owners with fewer than 22 well sites (and conversely, underestimate cost-effectiveness for owners with more than 22 well sites). In order to best focus resources and effort on the well sites with the greatest emissions and more accurately capture costs, particularly for owners with fewer well sites, the EPA requests comment on the number of wells that likely emit at each baseline emissions level, and the baseline emissions level of wells generally owned by owners with few wells. The EPA anticipates that it may refine its BSER determination for well sites through its supplemental proposal based on the information gathered from commenters.

Taking these factors into account, and as explained in more detail below, the EPA proposes to conclude that (1) BSER for well sites with a baseline site-wide emissions level of less than 3 tpy is no regular monitoring, but that to help ensure that these sites actually emit at less than 3 tpy, a one-time survey (following each calculation of site-level baseline methane emissions) would be required to ensure that any abnormalities are addressed; (2) BSER for well sites with a baseline site-wide emissions level of 3 tpy or greater is quarterly monitoring. Because of the uncertainties discussed above, and as explained in more detail below, the EPA further co-proposes to conclude that BSER for well sites with a baseline site-wide emissions level of 3 tpy or greater and less than 8 tpy is semiannual monitoring. Our co-proposal is the same as our main proposal with regard to well sites whose baseline site-wide emissions are less than 3 tpy (no regular monitoring, but a one-time survey) and whose emissions are 8 tpy or greater (quarterly monitoring). The EPA estimates that a majority of fugitive emissions (approximately 86%) can be attributed to wells with site-wide baseline emissions of 3 tpy or

greater, where 54% can be attributed to wells with site-wide baseline emissions of 8 tpy or greater.[231]

Proposed BSER for Well Sites with Baseline Emissions Less Than 3 tpy. As noted, in both our main proposal and our co-proposal, we propose to conclude that BSER for well sites with baseline emissions of less than 3 tpy is no regular monitoring, but a one-time survey to help ensure that these sites actually emit at less than 3 tpy.

Based on the matrix described above, the EPA determined that where total site baseline methane emissions are 2 tpy, semiannual and quarterly monitoring costs approximately $2,700/ton methane reduced, while biennial and annual monitoring costs approximately $4,000/ton methane reduced. The costs for VOC reductions range from $10,000 to $15,000/ton VOC reduced for quarterly to biennial monitoring, respectively. These costs are outside the range of what we are proposing to consider cost effective on a single-pollutant basis for both methane and VOC. See Section IX.B. However, when considered on a multipollutant basis, the costs of semiannual and quarterly monitoring are approximately $1,350 per ton methane reduced, and approximately $5,000 per ton of VOC, which we do consider cost-effective. Thus, for sites with total baseline methane emissions of 2 tpy, we conclude that regular monitoring at semiannual or quarterly frequencies would be cost-effective.[232]

We do not propose to conclude that routine monitoring with OGI is the BSER for sites with baseline emissions of less than 3 tpy, however, for several reasons. While the estimates for

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[231] Percentages were estimated for the baseline scenario in the RIA for the 2030 analysis year by combining the bin percentages presented in RIA Table 2-4 with the projected well site activity data documented in the RIA.

[232] The NSPS OOOOb and EG OOOOc TSD also provide costs for monitoring at 1 tpy, which is not considered cost-effective at any frequency evaluated.

semiannual and quarterly monitoring are within what we consider to be cost effective for well sites with baseline emissions of 2 tpy, in light of the large cohort of relatively lower-emitting sites, we are concerned that our cost effectiveness estimates may not accurately capture the costs, and therefore cost-effectiveness, of routine monitoring with OGI for businesses that own relatively few well sites. Throughout the development of the 2016 NSPS OOOOa, and in subsequent analyses and rulemaking actions, industry stakeholders have consistently stated that the fugitive monitoring requirements are particularly burdensome for smaller entities that own fewer well sites. The EPA believes that many of these smaller entities are likely to own well sites with baseline emissions of less than 3 tpy, a category that tends to include smaller and less complex facilities with few or no major pieces of production and processing equipment.[233] And as noted, the EPA would like to ensure that resources and effort are focused on well sites with significant emissions. Given the possibility that our cost-effectiveness analysis has overestimated the average number of sites, and therefore underestimated the cost-effectiveness, for this cohort of well sites, the EPA is proposing no regular monitoring at sites with baseline site-wide emissions of less than 3 tpy.

While the EPA is proposing to conclude that BSER for well sites with total site-level baseline methane emissions less than 3 tpy is no regular monitoring, we believe it is essential to ensure that well sites in this monitoring tier are operating in a well-controlled manner, and are

[233] Anna M. Robertson, Rachel Edie, Robert A. Field, David Lyon, Renee McVay, Mark Omara, Daniel Zavala-Araiza, and Shane M. Murphy. *"New Mexico Permian Basin Measured Well Pad Methane Emissions Are a Factor of 5-9 Times Higher Than U.S. EPA Estimates." Environmental Science & Technology* 2020 *54* (21), 13926-13934. DOI: 10.1021/acs.est.0c02927

not experiencing leaks or malfunctions that would cause their emissions to exceed 3 tpy. Therefore, the EPA is proposing a requirement for owners and operators to conduct a survey, and perform repairs as needed, to demonstrate that the well site is free of leaks or malfunctions and is therefore operating in a manner consistent with the baseline methane emissions calculation.[234] This survey could employ any method available that would demonstrate the actual emissions are consistent with the baseline calculation, including, but not limited to, the use of OGI, EPA Method 21 (which includes provisions for a soap bubble test), or alternative methane detection technologies like those discussed in the proposed screening alternative in section XI.A.5.

The EPA seeks comment on all aspects of this proposed BSER determination, including information, data, and analysis that would shed further light on the factors and concerns just expressed and that would support the establishment of ongoing monitoring requirements at the cohort of sites with baseline methane emissions below 3 tpy. Among other things, the EPA seeks comment on the ownership profile of well sites with site-wide baseline emissions less than 3 tpy, the extent to which well sites in this cohort are owned by firms that own relatively few wells, and the relative economic costs associated with requiring regular OGI monitoring at these wells. The EPA also seeks information that would improve our understanding of the overall number of wells that would fall in this cohort of sites, and the contribution these wells make to overall fugitive emissions. And the EPA seeks comment on our estimates of the costs and emission reduction associated with OGI monitoring at this cohort of sites, or other data and analysis that would provide support for regular OGI monitoring at these sites. In addition, the EPA notes that

[234] We anticipate that during the survey to confirm their baseline methane emissions and thus exemption status, sources would also repair the leaks found, consistent with our understanding of the standard industry practice.

the advanced measurement technologies that form the basis of our proposed alternative screening option in section XI.A.5 could be particularly well-suited for rapidly and cost-effectively detecting recurrences of large emitting events at sites with baseline emissions below 3 tpy. Accordingly, the EPA seeks comment that could inform whether to require the use of these technologies for ongoing monitoring at this cohort of sites, including information on the capabilities of these emerging technologies, methodologies for their use, and the costs and emission reductions associated with using these advanced measurement technologies as part of a mandatory monitoring regime. If appropriate, and based on input received during the comment period, the EPA may consider further addressing monitoring requirements for sites with baseline emissions below 3 tpy as part of a supplemental proposal.

Additionally, the EPA is soliciting comment on different criteria, such as the number of well sites owned by a specific owner, that could better account for factors that may affect the costs of fugitive emissions monitoring. As noted, while the EPA has presented costs on an individual site-level, we have also distributed the costs of recordkeeping evenly across an assumed 22 sites within a company-defined area. While this may be appropriate for companies with larger ownership, it is likely underestimating the cost (and overestimating the cost-effectiveness) on owners with fewer sites. Information provided on small businesses, including ownership thresholds, could be used to further determine differences in OGI monitoring requirements at well sites through a supplemental proposal.

Further, the EPA is soliciting comment on whether the presence of specific major production and processing equipment types at a well site warrants a separate monitoring frequency consideration even where the calculated total site-level baseline methane emissions

are below 3 tpy. As mentioned throughout this preamble, the EPA is concerned about the presence of large emission events, which various studies have shown are most often attributed to specific equipment. This equipment includes separators paired with onsite storage vessels, combustion devices, and intermittent pneumatic controllers.[235,236,237] Therefore, the EPA is soliciting comment on whether well sites with these specific types of equipment present must conduct at least semiannual monitoring, regardless of the total site-level baseline methane emissions calculated, including those sites calculated below 3 tpy.

Finally, the EPA believes there is a subset of well sites (*i.e.,* wellhead only well sites) that will never have baseline methane fugitive emissions of 3 tpy or greater. Therefore, the proposed rule would not define these sites as affected facilities, thus removing the need for these sites to determine baseline emissions. As defined in the 2020 Technical Rule, a "wellhead only well site" is "a well site that contains one or more wellheads and no major production and processing equipment." The term "major production and processing equipment" is defined as including reciprocating or centrifugal compressors, glycol dehydrators, heater/treaters, separators, and storage vessels collecting crude oil, condensate, intermediate hydrocarbon liquids, or produced water. As described earlier in this section, sites will calculate their baseline methane emissions using a combination of population-based emission factors and storage vessel emissions. The population-based emission factors include emissions from wellheads, reciprocating and

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[235] *Id.*

[236] Tyner, David R., Johnson, Matthew R., *"Where the Methane Is – Insights from Novel Airborne LiDAR Measurements Combined with Ground Survey Data." Environmental Science & Technology* 2021 *55* (14), 9773-9783. DOI: 10.1021/acs.est.1c01572.

[237] Rutherford, J.S., Sherwin, E.D., Ravikumar, A.P. *et al.* Closing the methane gap in US oil and natural gas production emissions inventories. *Nat Commun* 12, 4715 (2021). https://doi.org/10.1038/s41467-021-25017-4

centrifugal compressors, glycol dehydrators, heater/treaters, separators, natural gas-driven pneumatic pumps, and natural gas-driven pneumatic controllers (both continuous and intermittent). By definition, a wellhead only well site would not have emissions associated with the major production and processing equipment, which includes storage vessels. Further, this proposed rule would not allow the use of natural gas-driven pneumatic controllers at any location (except on the Alaska North Slope), including wellhead only well sites. Therefore, the only emissions would be calculated based on the fugitive emissions components associated with the wellhead, which we believe would never be above 3 tpy.

Proposed BSER for Sites with Baseline Emissions of 3 tpy or Greater. The EPA next evaluated what frequency of OGI monitoring is BSER for well sites where the total site-level baseline methane emissions are 3 tpy or greater. Table 14 summarizes the cost-effectiveness information for each monitoring frequency evaluated at this threshold.

TABLE 14. SUMMARY OF EMISSION REDUCTIONS AND COST-EFFECTIVENESS FOR SITE-LEVEL BASELINE METHANE EMISSIONS OF 3 TPY

Monitoring Frequency	Annual Cost ($/yr/site)	Methane Emission Reduction (tpy/site)	VOC Emission Reduction (tpy/site)	Single-Pollutant		Multipollutant	
				Methane Cost-Effectiveness ($/ton)	VOC Cost-Effectiveness ($/ton)	Methane Cost-Effectiveness ($/ton)	VOC Cost-Effectiveness ($/ton)
3 tpy site-level baseline methane emissions							
Biennial	$2,500	0.90	0.25	$2,800	$10,000	$1,400	$5,000
Annual	$3,000	1.20	0.33	$2,500	$9,000	$1,250	$4,500
Semiannual	$3,200	1.80	0.50	$1,800	$6,400	$900	$3,200
Quarterly	$4,200	2.40	0.67	$1,800	$6,300	$900	$3,200
Monthly	$8,100	2.70	0.75	$3,000	$11,000	$1,500	$5,400

Based on the information summarized in Table 14, the average costs per ton reduced

appear to be reasonable for either semiannual or quarterly monitoring when site-level baseline methane emissions are 3 tpy or greater under the single pollutant approach for methane (biennial, annual, or monthly are outside of what the EPA considers reasonable for VOCs in the single pollutant approach), or reasonable at any frequency under the multipollutant approach.

In addition to considering the average costs per ton reduced for these sites, the EPA also evaluated the incremental cost associated with progressing to greater monitoring frequencies. To conduct this analysis, the EPA first considered semiannual monitoring for these sites as a baseline for comparison. Since 2016, owners and operators have been conducting semiannual monitoring pursuant to NSPS OOOOa, State requirements, or voluntarily, thus demonstrating the reasonableness of that frequency. Additionally, the cost is comparable to the costs found reasonable in the 2016 NSPS OOOOa[238] for both the single pollutant approach for methane or multipollutant approach for both methane and VOC. To determine if quarterly monitoring is reasonable for sites with total baseline methane emissions of 3 tpy, we evaluated the incremental costs of going from semiannual to quarterly monitoring. The incremental costs of semiannual to quarterly monitoring for an emissions baseline of 3 tpy methane is $1,700/ton methane and $6,000/ton VOC using the single pollutant approach (and $800/ton methane and $3,000/ton VOC using the multipollutant cost effectiveness approach). These incremental costs are within the range we find reasonable in this proposal under the single pollutant approach for methane and under the multipollutant approach.

We next evaluated monthly monitoring for this cohort. As shown in Table 14, monthly

[238] The 2020 Technical Rule amended only the VOC standards in the 2016 NSPS OOOOa and, as discussed in section X.A, incorrectly identified $738/ton as the highest value that the EPA found cost effective for methane reduction in the 2016 NSPS OOOOa.

monitoring appears reasonable under the multipollutant approach. Therefore, we evaluated the incremental costs of going from quarterly monitoring to monthly monitoring to determine if monthly monitoring is appropriate. Table 15 summarizes these incremental costs. As shown in Table 15, the incremental cost of going from quarterly to monthly monitoring when baseline emissions are 3 tpy is $13,000/ton methane and $47,000/ton VOC under the single pollutant approach ($6,500/ton methane and $23,500/ton VOC under the multipollutant approach). In both approaches, these costs are outside the range of what we are proposing to consider cost effective. See Section IX.B.

Based on the analysis described above, we propose to find that quarterly monitoring at well sites with total site-level baseline methane emissions of 3 tpy or greater is the BSER. We note that California requires quarterly inspections for all well sites under its LDAR requirements in Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4, Article Subarticle 13: *Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities*, which supports a conclusion that quarterly monitoring at these sites is feasible and cost-effective.[239]

Accordingly, the EPA's primary proposal is to conclude that BSER for well sites with total site-level baseline emissions of less than 3 tpy is no regular monitoring (but a one-time survey) and that BSER for well sites with total site-level baseline emissions of 3 tpy or greater is quarterly monitoring and repair.

While the EPA is proposing quarterly OGI monitoring for well sites with total site-level baseline methane emissions of 3 tpy or greater, we are concerned this cost-effectiveness analysis

[239] *https://ww2.arb.ca.gov/sites/default/files/classic/regact/2016/oilandgas2016/ogfro.pdf.*

may not fully account for the numerosity and diversity of sites and their potential emission profiles. We further note that some States with established fugitive emissions monitoring programs have provided for more graduated frequencies that recognize this diversity among sites. For example, Colorado's Regulation 7 Control of Ozone via Ozone Precursors and Control of Hydrocarbons via Oil and Gas Emissions[240] requires a tiered inspection frequency regime that provides for semiannual monitoring at site-wide baseline emissions thresholds that far exceed the EPA's proposed 3 tpy threshold. Under the Colorado regulations, a semiannual inspection frequency is required for well production facilities with uncontrolled actual VOC emissions between 2 and 12 tpy (corresponding to approximately 7 to 43 tpy methane). Quarterly inspections are required for well sites without storage tanks and with uncontrolled actual VOC emissions between 12 and 20 tpy (corresponding to approximately 43 to 72 tpy methane), and for well sites with storage tanks and with uncontrolled actual VOC emissions between 12 and 50 tpy (corresponding to approximately 43 to 180 tpy methane). Colorado Regulation 7 also requires monthly inspections for well production facilities without storage tanks with uncontrolled actual VOC emissions above 20 tpy (and above 50 tpy for facilities with storage tanks). The proposed thresholds for quarterly monitoring in this action are more stringent than the Colorado regulations when compared using the gas composition ratio of 0.28 VOC to methane that is used in our BSER analysis. Specifically, the VOC emissions associated with a site-level baseline methane emission rate of 3 tpy are 0.83 tpy VOC, less than half the VOC threshold that requires semiannual monitoring and 14.5 times lower than the VOC threshold requiring quarterly monitoring in Colorado.

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[240] *https://cdphe.colorado.gov/aqcc-regulations*

Although Colorado's regulations are most directly comparable to the EPA's proposed approach, other States also provide for more graduated monitoring frequencies. For example, Ohio's General Permits 12.1 and 12.2 initially require quarterly monitoring for well sites, followed by a reduced monitoring frequency of semiannual or annual monitoring depending on the fraction of equipment found to be leaking.[241]

When considering these State programs, particularly the comparison of our proposal to Colorado's thresholds; the fact that our cost-effectiveness calculation may not account for the diversity of emissions and sites; and the concerns we have raised regarding the cost-effectiveness for businesses with fewer well sites than are assumed in our cost-effectiveness analysis (many of whom we anticipate are small businesses), the EPA believes it is also appropriate to co-propose semiannual monitoring for well sites in a middle cohort—those with total site-level baseline emissions of 3 tpy or greater and less than 8 tpy. We seek comment on the number and ownership profile of wells that would fall into this category to better understand whether semiannual monitoring is an appropriate monitoring frequency for sites in this range.

To inform this analysis, we evaluated methane emissions in 1 tpy increments starting at 3 tpy. Tables 15a and 15b summarize the total costs and incremental costs of semiannual to quarterly for baseline methane emissions of 3 tpy or greater and less than 8 tpy.

TABLE 15a. SUMMARY OF TOTAL COST-EFFECTIVENESS FOR FUGITIVE MONITORING AT WELL SITES

Site-Level Baseline Methane Emissions (tpy)	Annual Cost ($/yr/site)	Single Pollutant Cost-Effectiveness		Multipollutant Cost-Effectiveness	
		Methane ($/ton)	VOC ($/ton)	Methane ($/ton)	VOC ($/ton)
Semiannual Monitoring					

[241] *https://epa.ohio.gov/dapc/genpermit/oil-and-gas-well-site-production*

3	$3,200	$1,800	$6,400	$890	$3,200
4	$3,200	$1,300	$4,800	$670	$2,400
5	$3,200	$1,100	$3,800	$530	$1,900
6	$3,200	$890	$3,200	$440	$1,600
7	$3,200	$760	$2,700	$380	$1,400
8	$3,200	$670	$2,400	$330	$1,200
Quarterly Monitoring					
3	$4,200	$1,800	$6,300	$880	$3,200
4	$4,200	$1,300	$4,700	$660	$2,400
5	$4,200	$1,000	$3,800	$530	$1,900
6	$4,200	$880	$3,200	$440	$1,600
7	$4,200	$750	$2,700	$380	$1,400
8	$4,200	$660	$2,400	$330	$1,200

TABLE 15b. SUMMARY OF INCREMENTAL COST-EFFECTIVENESS FOR FUGITIVE MONITORING AT WELL SITES

Site-Level Baseline Methane Emissions (tpy)	Incremental Annual Cost ($/yr/site)	Incremental Methane Emission Reduction (tpy/site)	Incremental VOC Emission Reduction (tpy/site)	Incremental Cost-Effectiveness	
				Methane ($/ton)	VOC ($/ton)
Incremental for semiannual to quarterly					
3	$1,000	0.60	0.17	$1,700	$6,000
4	$1,000	0.80	0.22	$1,250	$4,500
5	$1,000	1.00	0.27	$1,000	$3,600
6	$1,000	1.20	0.33	$840	$3,000
7	$1,000	1.40	0.39	$720	$2,600
8	$1,000	1.60	0.45	$630	$2,250

While there is no obvious cutoff point, the EPA anticipates that well sites with calculated baseline emissions of 8 tpy or greater will generally consist of complex sites comprising multiple wellheads and/or one or more of the major pieces of production or processing equipment that are known to have a propensity for causing large emissions events. The EPA also believes it is possible that at 8 tpy and greater, well sites are both more likely to be owned by companies with a larger number of sites and that the owners of these wells are likely to be larger companies.

Lastly, the EPA estimates that a large share of fugitive emissions (approximately 54%) can be attributed to wells with site-wide baseline emissions of 8 tpy or greater.[242] For these reasons, the EPA believes that an 8 tpy threshold for quarterly monitoring would appropriately focus resources on the wells with the largest emissions profiles, and that concerns about on the costs for small owners or operators are most attenuated for this cohort of relatively large and high-emitting sites. As noted above, we seek comment on whether it is sensible to have a middle cohort with a semiannual monitoring requirement and, if so, what the bounds of that cohort should be. In making this determination, the EPA is particularly interested in comments regarding the number and ownership profiles of well sites that may fall into this middle cohort.

As required by section 111, the EPA's proposed BSER analysis for fugitive emissions from all well sites has considered nonair quality health and environmental impacts. No secondary gaseous pollutant emissions or wastewater are generated during the monitoring and repair of fugitive emissions components. There are some emissions that would be generated by contractors conducting the OGI camera monitoring associated with driving to and from the site for the fugitive emissions survey. Using AP-42 mobile emission factors and assuming a distance of 70 miles to the well site, the emissions generated from semiannual monitoring at a well site (140 miles to and from the well site twice a year) is estimated to be 0.35 lb/yr of hydrocarbons, 6.0 lb/yr of CO and 0.40 lb/yr of NOx. No other secondary impacts are expected. We do not believe these secondary emissions are so significant as to affect the proposed determinations described above.

[242] Percentage estimated using the analysis underpinning the baseline scenario in the RIA for the 2030 analysis year.

In summary, based on the analysis described above, the EPA is proposing OGI monitoring based on tiered total site-wide baseline methane emission levels to represent thresholds that would determine the monitoring frequency. For well sites with total site-level methane emissions less than 3 tpy, the EPA is proposing to require a one-time survey to demonstrate that the well site is free of leaks or other abnormal conditions that are not accounted for in the baseline calculation. For well sites with total site-level methane emissions of 3 tpy or greater, the EPA is proposing quarterly monitoring at all sites. Lastly, the EPA is co-proposing semiannual monitoring for well sites with total site-level methane emissions of 3 tpy or greater and less than 8 tpy, and quarterly monitoring for all sites with baseline emissions of 8 tpy or greater. As noted earlier, site-level baseline emission levels would be calculated by owners and operators for each site based on prescribed population emission factors for components and equipment at the site, combined with an assessment of potential methane emission from storage vessels (after applying controls).

b. Fugitive Emissions from Compressor Stations

The EPA continues to utilize the model plant approach in estimating baseline fugitive emissions from compressor stations. Unlike well sites, we believe that compressor station designs are less variable and that model plants are an effective construct to analyze fugitive emission control programs. The EPA has evaluated feedback received from several industry stakeholders related to development of compressor station model plants over multiple years since the original 2015 NSPS OOOOa proposal were model plants for compressor stations (including those at gathering and boosting stations, transmission stations, and storage facilities) were first introduced. Consistent with this early approach for estimating emissions from compressor

stations, the EPA still believes the model plant approach is the best way to assess fugitive emissions from compressor stations, in the absence of information indicating otherwise. Baseline model plant emissions for compressor stations can reasonably be calculated using equipment counts, fugitive emissions component counts, and emissions factors from the 1995 Emissions Protocol. The EPA has evaluated each specific model plant for gathering and boosting, transmission, and storage, based on information that has become available, and model plants were updated where information indicated an update was appropriate. For example, information from actual compressor stations in operation provided by GPA Midstream for several of their member companies representing numerous sites across the country, was used to refine the gathering and boosting model plant in 2020. Refinements have also been made to the transmission and storage model plants based on information received from companies in these segments. The size and equipment located at compressor stations do not vary as widely as at well sites, and therefore emissions are expected to be less variable as well. Furthermore, stakeholders have not indicated that a model plant approach is not reasonable. For these reasons, the EPA retains a model plant approach for compressor stations which are representative in estimating fugitive emissions.

There are three types of compressor stations in the Crude Oil and Natural Gas source category: (1) Gathering and boosting stations, (2) transmission stations, and (3) storage stations. The equipment associated with these compressor stations vary depending on the volume of natural gas that is transported and whether any treatment of the gas occurs, such as the removal of water or hydrocarbons. The model plants developed for these sites include all equipment (including piping and associated components, compressors, generators, separators, storage

vessels, and other equipment) and associated components (*e.g.,* valves and connectors) that may be sources of fugitive emissions associated with these operations. One model plant was developed for each of the three types of compressor stations described above, which are discussed in detail in the 2020 NSPS OOOOa TSD and in the NSPS OOOOb and EG TSD supporting this action. For gathering and boosting stations, the fugitive baseline emissions were estimated to be 16.6 tpy of methane and 4.6 tpy of VOC. For transmission stations, the fugitive baseline emissions were estimated to be 40.4 tpy of methane and 1.1 tpy of VOC. For storage stations, the fugitive baseline emissions were estimated to be 142.2 tpy of methane and 3.9 tpy of VOC.

As with well sites, in the original BSER analysis for the 2016 NSPS OOOOa rulemaking, two options for reducing fugitive methane and VOC emissions at compressor stations were identified, which were (1) a fugitive emissions monitoring program based on individual component monitoring using EPA Method 21 for detection combined with repairs and (2) a fugitive emissions monitoring program based on the use of OGI detection combined with repairs. Finding that both methods achieve comparable emission reduction but OGI was more cost effective, the EPA ultimately identified quarterly monitoring of compressor stations using OGI as the BSER. 81 FR 35862. While there are several new fugitive emissions technologies under development, the EPA needs additional information and better understanding of these technologies, and they are therefore not being evaluated as potential BSER at this time. For this analysis for both the NSPS and the EG, we re-evaluated OGI as BSER. In the discussion below, we evaluate OGI control options based on varying the frequency of conducting the survey and fugitive emissions repair threshold (*i.e.,* the visible identification of methane or VOC when an

OGI instrument is used). For this analysis, we considered annual, semiannual, quarterly, and monthly survey frequency for compressor stations.

In 2015, we evaluated the potential emission reductions from the implementation of an OGI monitoring program where an emission reduction of 40, 60 and 80 percent for annual, semiannual, and quarterly monitoring survey frequencies, respectively, were determined appropriate. No other information reviewed since 2015 indicates that the assigned reduction frequencies are different than previously established and the reduction efficiencies are consistent with what current information indicates. In addition, we also evaluated monthly monitoring for compressor stations where information evaluated indicated monthly OGI monitoring has the potential of reducing emissions up towards 90 percent.

We evaluated the costs of monitoring and repair under various monitoring frequencies described above, including the cost of OGI monitoring via the camera survey, repair costs, resurvey costs, monitoring plan development and the cost of a recordkeeping system. For compressor stations, the capital cost associated with the fugitives monitoring program were estimated to be $3,090 for each gathering and boosting compressor station, which includes development of a fugitive emissions monitoring plan for a company-defined area (assumed to include 7 gathering and boosting compressor stations) and database management development or licensing for recordkeeping. These capital costs are divided evenly amongst the 7 gathering and boosting compressor stations in the company-defined area for purposes of the model plant analysis, consistent with the 2016 NSPS OOOOa and 2020 Technical Rule analyses. The capital cost associated with the fugitives monitoring program for transmission and storage compressor stations was estimated at $23,880, which is for a single transmission and storage compressor

station. The annual costs include the capital recovery cost (calculated at a 7 percent interest rate for 10 years), survey and repair costs, database management fees, and recordkeeping and reporting costs. The annual costs estimated for compressor stations range from $6,350 for annual monitoring to $33,220 for monthly monitoring at gathering and boosting compressor stations. For transmission compressor stations, the annual costs estimated range from $12,900 for annual monitoring to $39,770 for monthly monitoring. For storage compressor stations, the annual costs estimated range from $17,000 for annual monitoring to $43,860 for monthly monitoring.

As discussed above, the EPA is proposing that natural gas-driven intermittent vent controllers at production and natural gas transmission sites in Alaska without electricity would be subject to a standard that prohibits emissions when the controller is idle. Intermittent pneumatic controllers are designed to vent during actuation only, but these devices are known to malfunction and operate incorrectly which causes them to release natural gas to the atmosphere when idle. For sites in Alaska that do not have electricity located in the production segment (well sites, gathering and boosting stations, and centralized tank batteries) and in the transmission and storage segment, the EPA is proposing to define intermittent natural gas-driven pneumatic controllers as an affected facility and proposing to apply a standard that these controllers only vent during actuation and not when idle. See section XII.C on pneumatic controllers for a full explanation of this standard. We have determined that it would be efficient and reasonable to verify proper actuation and that venting does not occur during idle times by proposing that these devices are monitored along with fugitive emissions components at a site to ensure these devices are meeting the standard. We believe the cost of monitoring of intermittent pneumatic controllers will be absorbed by the cost of the fugitive emissions program, and that little to no additional

cost would be associated with monitoring these devices on the fugitive emissions components monitoring schedule. If compressor stations have electricity, they would be required to have non-emitting controllers, and no additional costs are expected to be incurred relayed to repair and/or replacement of malfunctioning intermittent vent controllers.

At gathering and boosting compressor stations there are savings associated with the gas not being released. The value of the natural gas saved is assumed to be $3.13 per Mcf of recovered gas. Transmission and storage compressor stations do not own the natural gas; therefore, revenues from reducing the amount of natural gas emitted/lost was not applied for this segment.

The EPA evaluated the cost-effectiveness of monitoring for each sub-type of compressor station, starting with evaluating whether quarterly monitoring remains the BSER. The 2016 NSPS OOOOa requires a fugitive emissions monitoring and repair program, where compressor stations have to be monitored quarterly. Compressor stations have successfully met this standard. Further, several State agencies have rules that require quarterly monitoring at compressor stations. For example, Colorado's Regulation 7 Control of Ozone via *Ozone Precursors and Control of Hydrocarbons via Oil and Gas Emissions*[243] requires a semiannual inspection frequency for compressor stations with uncontrolled actual VOC emissions between 2 and 12 tpy, a quarterly inspection frequency for compressor stations with uncontrolled actual VOC emissions between 12 and 50 tpy, and monthly inspections for compressor stations with uncontrolled actual VOC emissions above 50 tpy. California requires quarterly inspections under

[243] *https://cdphe.colorado.gov/aqcc-regulations*

their LDAR requirements[244] and similarly, Ohio's General Permit 18.1 also requires quarterly monitoring for compressor stations.[245] These examples of State rules, where quarterly monitoring appears to be the lowest monitoring frequency required with one exception where the VOC baseline emissions were extraordinarily high, is a demonstration of the reasonableness of monitoring fugitive emissions components on a quarterly basis for compressor stations.

Given the apparent reasonableness of quarterly monitoring as discussed above, the EPA evaluated whether it was reasonable to require monthly monitoring for compressor stations. Table 16 summarizes the cost, emission reductions, and cost-effectiveness of quarterly and monthly OGI monitoring at compressor stations for the single pollutant approach, while Table 17 summarizes the multi-pollutant approach.

TABLE 16: SUMMARY OF THE SINGLE POLLUTANT COST OF CONTROL FOR COMPRESSOR STATION FUGITIVE EMISSIONS MONITORING

Model Plant	**Capital Cost ($)**	**Annual Cost ($/yr)**	**Annual Cost w/Savings ($/yr)**	**Emission Reductions**		**Methane Cost of Control**	**VOC Cost of Control**
				Methane (Tons/yr)	**VOC (Tons/yr)**	**w/o Savings ($/Ton)**	**w/o Savings ($/Ton)**
Quarterly Monitoring							
Gathering & Boosting	$3,100	$13,400	$11,000	13.3	3.7	$1,000	$3,600
Transmission	$23,900	$19,900	$19,900	32.3	0.9	$600	$22,300
Storage	$23,900	$24,000	$24,000	114.0	3.2	$200	$7,600
Compressor Program Weighted Average						**$900**	**$4,400**
Monthly Monitoring							
Gathering & Boosting	$3,100	$33,200	$30,500	15.0	4.2	$2,200	$8,000

[244] *https://ww2.arb.ca.gov/sites/default/files/classic/regact/2016/oilandgas2016/ogfro.pdf.*
[245] *https://www.epa.state.oh.us/dapc/genpermit/ngcs/GP_181.*

Model Plant	Capital Cost ($)	Annual Cost ($/yr)	Annual Cost w/Savings ($/yr)	Emission Reductions		Methane Cost of Control	VOC Cost of Control
				Methane (Tons/yr)	VOC (Tons/yr)	w/o Savings ($/Ton)	w/o Savings ($/Ton)
Transmission	$23,900	$39,800	$39,800	36.4	1.0	$1,100	$39,500
Storage	$23,900	$43,900	$43,900	128.2	3.5	$340	$12,400
Compressor Program Weighted Average						**$1,800**	**$9,300**

TABLE 17: SUMMARY OF THE MULTI-POLLUTANT COST OF CONTROL FOR COMPRESSOR STATION FUGITIVE EMISSIONS MONITORING

Model Plant	Capital Cost ($)	Annual Cost ($/yr)	Annual Cost w/Savings ($/yr)	Emission Reductions		Methane Cost of Control	VOC Cost of Control
				Methane (Tons/yr)	VOC (Tons/yr)	w/o Savings ($/Ton)	w/o Savings ($/Ton)
Quarterly Monitoring							
Gathering & Boosting	$3,100	$13,400	$11,00	13.3	3.7	$500	$1,800
Transmission	$23,900	$19,900	$19,900	32.3	0.9	$300	$11,100
Storage	$23,900	$24,000	$24,000	114.0	3.2	$100	$3,800
Compressor Program Weighted Average						**$430**	**$2,200**
Monthly Monitoring							
Gathering & Boosting	$3,100	$33,200	$30,500	15.0	4.2	$1,100	$4,000
Transmission	$23,900	$39,800	$39,800	36.4	1.0	$550	$19,800
Storage	$23,900	$43,900	$43,900	128.2	3.5	$200	$6,200
Compressor Program Weighted Average						**$900**	**$4,600**

Based on the single pollutant approach, both quarterly and monthly frequencies are reasonable for methane emissions, while only quarterly is reasonable for VOC emissions. Like

described for well sites, owners and operators of compressor stations have been monitoring quarterly since 2016 pursuant to NSPS OOOOa, State requirements, or voluntarily, which suggests these costs are reasonable. These costs for quarterly monitoring are also comparable to those found reasonable in both the 2016 NSPS OOOOa and the 2020 Technical Rule. Further, both frequencies are reasonable under the multipollutant approach when considering the total cost-effectiveness compared to a baseline of no OGI monitoring.

The EPA then looked at the incremental costs of going from quarterly to monthly monitoring. Quarterly monitoring achieves an emission reduction ranging from 13.3 tpy at gathering and boosting compressor stations to 114 tpy at storage compressor stations. Monthly monitoring achieves additional reductions ranging from 1.7 tpy at gathering and boosting compressor stations to 14.2 tpy at storage compressor stations. However, these additional reductions are achieved at $9,400/ton methane (and nearly $50,000/ton VOC). The EPA finds that achieving these additional emissions reductions is not reasonable for the cost, given the only small fraction of additional reductions realized at monthly monitoring. Based on the cost analysis summarized above, we find that the cost effectiveness of quarterly monitoring for compressor stations is reasonable.

Finally, no secondary gaseous pollutant emissions or wastewater are generated during the monitoring and repair of fugitive emissions components. There are some emissions that would be generated by the OGI camera monitoring contractors with respect to driving to and from the site for the fugitive emissions survey. Using AP-42 mobile emission factors and assuming a distance of 70 miles to the compressor station, the emissions generated from quarterly monitoring at a compressor station (140 miles to and from the compressor station four times a year) is estimated

to be 0.70 lb/yr of hydrocarbons, 12.0 lb/yr of CO and 0.80 lb/yr of NOx. No other secondary impacts are expected.

In light of the above, we find that the BSER for reducing methane and VOC emissions from all compressor stations, including gathering and boosting stations, transmission stations, and storage stations is quarterly monitoring for this proposal. Therefore, for NSPS OOOOb, we are proposing to require quarterly monitoring for all compressor stations.

2. EG OOOOc

The EPA also evaluated BSER for the control of fugitive emissions at existing well sites and compressor stations. The findings were that the controls evaluated for new sources for NSPS OOOOb are appropriate for consideration under the EG OOOOc. Further, the EPA finds that the OGI monitoring, methane emission reductions, costs, and cost effectiveness results discussed above for new sources are also applicable for existing sources.

Therefore, for the EG OOOOc, the EPA is proposing presumptive standards to require quarterly monitoring for well sites with site-level baseline methane emissions greater than and equal to 3 tpy. Further, we are co-proposing semiannual monitoring for well sites with site-level baseline methane emissions greater than and equal to 3 tpy and less than 8 tpy, and quarterly monitoring for well sites with site-level baseline methane emissions greater than and equal to 8 tpy. We find the costs reasonable for existing well sites with total site-level baseline methane emissions greater than or equal to 3 tpy to conduct quarterly OGI monitoring at an incremental cost of $1,700/ton methane reduced. We are aware that there is a large percentage of existing well sites that are likely owned and operated by small businesses. We continue to be concerned about the burden of frequent OGI monitoring on these small businesses and are requesting

comment consistent with our solicitation for new sources.

The EPA also finds, and is proposing, that the BSER for reducing methane emissions from all existing compressor stations, including gathering and boosting stations, transmission stations, and storage stations is quarterly monitoring. For compressor stations, we find that both quarterly (at $430/ton methane reduced) and monthly monitoring (at $900/ton methane reduced) are reasonable when looking at total cost-effectiveness against a baseline of no monitoring, however, at an incremental cost of $9,400/ton methane reduced, monthly monitoring is not reasonable. Therefore, for the EG OOOOc, we are proposing a presumptive standard of quarterly monitoring for all compressor stations.

3. Alternative Screening Using Advanced Measurement Technology

As discussed throughout this preamble, the EPA recognizes the existence large emission events. In certain instances, these situations could be caused by severely and continuously leaking components that would be identified and corrected via the routine OGI-based periodic monitoring program, but only on a quarterly or semiannual basis. Moreover, some large emission events are intermittent and stochastic in nature and may not be identified via these OGI surveys. Since the 2016 NSPS OOOOa, significant strides have occurred in developing and deploying methane detection technologies that can detect fugitive emissions (especially large emission events) in a potentially faster and more cost-effective manner than traditional techniques such as OGI and EPA Method 21. The EPA has continued following the development of these technologies and their applications through various public programs, such as the DOE ARPA-E programs, which have focused on the development of cost-effective tools to locate and measure methane emissions. Additionally, the EPA has continued discussions with stakeholders,

including academic researchers and private industry, as they develop and evaluate novel tools for the detection and quantification of methane emissions in the oil and gas sector. As noted in section VII.B, the EPA also held a two-day workshop in August 2021 to hear perspectives on these new technologies. Some of the promising technologies now emerging include, but are not limited to, fixed-base and open path sensor networks, unmanned aircraft systems (UAS) equipped with methane detection equipment, the use of high-end instruments for mobile measurements on the ground and in the air, and satellite observations with advanced optical techniques.

As the EPA learned during the Methane Detection Technology Workshop, industry has utilized these advanced measurement technologies to supplement existing fugitive emissions programs and to quickly identify unexpected emissions events (*e.g.,* emissions from controlled storage vessels) in order to make repairs as quickly as possible.[246] While most of these advanced measurement technologies are not sensitive enough to pin-point the exact same emission sources as the current fugitive emission detection programs, many can more quickly detect the largest emissions sources (*e.g.,* malfunctions and undersized or non-performing major equipment), and they can also find emissions that may be missed by fugitive emission surveys (*e.g.,* component-level leaks on valves, connectors, and meters). Moreover, the EPA understands the stochastic nature, distribution, and frequency of these large emission events across sites and over time is uncertain, and that these events occur sporadically at an individual site in ways that may take longer to detect or might not be detected through a periodic fugitive emissions survey using

[246] See summary report of the EPA's Methane Detection Workshop located at Docket ID No. EPA-HQ-OAR-2021-0317.

traditional technologies. Integrating advanced emission detection technologies into this rule – whether deployed by owner-operators themselves or by third parties – could be a valuable way to reduce fugitive emissions more cost-effectively and rapidly detect and remedy "super-emitting" events that make an outsize contribution to overall emissions from this source category.

There are many other advantages to these advanced measurement technologies over technologies currently used for fugitive emissions detection (*i.e.*, OGI and EPA Method 21 technologies). For instance, these advanced measurement technologies may be less susceptible to operator error or judgment than traditional methods of leak detection, thus making surveys more consistent and reliable. Many of these technologies can survey broader areas than can be effectively surveyed with field personnel, drastically reducing the driving time from site to site, which could have potential cost and safety benefits and allow for more frequent monitoring, which could allow for the identification and mitigation of large volume methane emissions sooner than OGI or EPA Method 21 surveys.

As described in section XI.A.5, the EPA is proposing an alternative work practice for detecting fugitive emissions that incorporates these advanced measurement technologies. There were a number of presentations during the Methane Detection Technology Workshop that discussed the detection capabilities of various methane measurement technologies which could be used for a screening approach. Given the diverse array of advanced technologies that are now in use, and the rapid pace at which these technologies are being refined and new technologies are being developed, the EPA believes that it is appropriate to articulate a foundational set of performance criteria and documentation requirements for this alternative work practice that can be applied to multiple existing and forthcoming technologies. Based on the information available

to the Agency, including the information presented in the Methane Detection Technology Workshop, the EPA believes setting a minimum detection threshold of 10 kg/hr methane might be appropriate for use in determining what technologies and in what deployment platforms (*e.g.,* fixed, ground and aerial) are appropriate for a potential screening alternative within the proposed NSPS OOOOb and EG OOOOc. Therefore, the specific alternative work practice that the EPA is proposing includes a provision that would allow the use of any technology with a minimum detection threshold of 10 kg/hr.

Although we have focused this discussion on advanced measurement technologies, the EPA is also soliciting comment on whether there are ways to utilize existing technologies to screen for large emission events. For example, could gauges or meters be utilized to identify potential large losses between the wellhead and the custody meter assembly.

Further, the EPA is seeking comment on very simple AVO checks that could be performed in conjunction with the periodic OGI monitoring surveys to help identify potential large emission events. For example, two often-cited causes of super-emitter sources are unlit flares and separator dump valves that are stuck open allowing unintentional gas carry-through to emit from storage vessels. The additional time and cost required to perform visual inspections to see if the flare pilot light is working, or to see if a dump valve is stuck open, would be minimal. Yet the benefits of simple AVO inspections could be significant. The EPA is soliciting comment on this concept, as well as comments on the common items that could be included on a checklist for such low-burden AVO inspections in conjunction with fugitive monitoring.

B. Proposed Standards for Storage Vessels

1. NSPS OOOOb

a. Background

In the 2012 NSPS OOOO, the EPA established VOC standards for storage vessels. Based on our review of these standards, we are proposing to retain the current standard of 95 percent reduction. However, the EPA is proposing to redefine the affected facility to include a tank battery. Specifically, the EPA is proposing to define a storage vessel affected facility as a single storage vessel or a group of storage vessels that are physically adjacent and that receive fluids from the same source (*e.g.,* well, process unit, or set of wells or process units) or manifolded together for the transfer of liquid or vapors. In this definition, we consider tanks to be physically adjacent when they are near or next to each other and may or may not be connected or piped together. In addition, the EPA is proposing methane standards for new, reconstructed, and modified storage vessels under the proposed NSPS OOOOb. Both the proposed revised VOC standards and the proposed methane standards would be the same (*i.e.,* 95 percent reduction of emissions from storage vessel affected facilities as defined above in this proposal). These reductions can be achieved by utilizing a cover and closed vent system to capture and route the emissions to a control device that achieves an emission reduction of 95 percent, or by routing the captured emissions to a process.

Both methane and VOC emissions from storage vessels are a result of working, breathing and flashing losses. Working losses occur when vapors are displaced due to the emptying and filling of storage vessels. Breathing losses are the release of gas associated with daily temperature fluctuations when the liquid level remains unchanged. Flashing losses occur when a liquid with dissolved gases is transferred from a vessel with higher pressure (*e.g.,* separator) to a vessel with lower pressure (*e.g.,* storage vessel), thus allowing dissolved gases and a portion of

the liquid to vaporize or flash. In the Crude Oil and Natural Gas source category, flashing losses occur when crude oils or condensates flow into a storage vessel from a separator operated at a higher pressure. Typically, the higher the operating pressure of the upstream separator, the greater the flash emissions from the storage vessel. Temperature of the liquid may also influence the amount of flash emissions. Lighter crude oils and condensate generally flash more hydrocarbons than heavier crude oils.

b. Definition of Affected Facility

The current standards apply to single storage vessels with potential VOC emissions of 6 tpy or greater, although the EPA has long observed that these storage vessels are typically located as part of a tank battery. 76 FR 52738, 52763 (Aug. 23, 2011). Further, the 6 tpy applicability threshold was established by directly correlating VOC emissions to throughput, was based on the use of a single combustion control device, regardless of the number of storage vessels routing emissions to that control device, and control of 6 tpy VOC was cost effective using that single control device. *Id.* at 52763-64. Over the years, there have been questions and issues raised regarding how to calculate the potential VOC emissions from individual storage vessels that are part of a tank battery. The EPA attempted to address this issue through various amendments to NSPS OOOO and NSPS OOOOa,[247] most recently in the 2020 Technical Rule. In the 2020 Technical Rule, the EPA continued to recognize that tank batteries are more prevalent than individual storage vessels. While the 2020 Technical Rule included amendments to the calculation methodology for determining potential VOC emissions from storage vessels

[247] See 79 FR 79018 and 80 FR 48262.

that are part of a tank battery, the EPA has now determined that it is more appropriate to evaluate the control of methane and VOC emissions from tank batteries [248] as a whole instead of each individual storage vessel within a tank battery.[249] In this review the EPA evaluated regulatory options based on the use of a single control device to reduce both methane and VOC emissions from a tank battery, which is consistent with the 2012 NSPS OOOO, 2016 NSPS OOOOa, and subsequent amendments to each of those rules. The EPA believes that this approach will simplify applicability criteria for owners and operators of storage vessels, and more accurately aligns with the EPA's original intent of how storage vessel affected facility status should be determined.

c. Modification

Section 60.14(a) of the general provisions to part 60 defines modification as follows: "Except as provided in paragraphs (e) and (f) of this section, any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies shall be considered a modification…." We also note that 40 CFR 60.14(f) states that "Applicable provisions set forth under an applicable subpart of this part shall supersede any conflicting provisions of this section." The EPA understands the difficulty assessing emissions from storage vessels and seeks to provide clarity on actions that are considered modification of a tank battery by explicitly listing these in the proposed NSPS OOOOb. We evaluated circumstances that would lead to an increase in the VOC and methane

[248] For purposes of this analysis and the resulting proposed standards, the term "tank battery" refers to a single storage vessel or a group of storage vessels that are physically adjacent and that receive fluids from the same source (*e.g.,* well, process unit, or set of wells or process units) or which are manifolded together for liquid or vapor transfer.

[249] This approach would no longer allow facilities to apply certain criteria and average the total potential VOC emissions of the tank battery across the number of storage vessels in the battery to determine a per-vessel potential for VOC emissions.

emissions from a tank battery and therefore constitute a modification of an existing tank battery. A modification of an existing tank battery would then require the tank battery owner or operator to assess the potential emissions relative to the proposed NSPS instead of the EG.

The EPA is proposing that a single storage vessel or tank battery is modified when any of the following physical or operational changes are made: (1) The addition of a storage vessel to an existing tank battery; (2) replacement of a storage vessel such that the cumulative storage capacity of the existing tank battery increases; and/or (3) an existing single storage vessel or tank battery that receives additional crude oil, condensate, intermediate hydrocarbons, or produced water throughput (from actions such as refracturing a well or adding a new well that sends these liquids to the tank battery). For both items 1 and 2, even if the type and quantity of fluid processed remains the same, the increased storage capacity will lead to higher breathing losses and thereby increase the VOC emissions from the tank battery relative to the VOC emissions prior to the vessel addition or replacement. Therefore, we conclude that these actions are a modification of the tank battery. However, we are soliciting comment to help us better understand the effect of the proposed definition number 1 and 2 on the number of new storage vessels or tank batteries that would be subject to the NSPS. Under the current definition of a storage vessel affected facility in NSPS OOOOa, which is each single storage vessel that meets the 6 tpy applicability threshold, a new storage vessel that is installed in an existing tank battery is an affected facility (assuming the 6 tpy applicability threshold is met for the single storage vessel) whether the new storage vessel is a replacement or an addition to the tank battery. However, under the proposed definition number 1 and 2 above, the NSPS OOOOb is triggered only if the new storage vessel is an addition to the tank battery or is of bigger capacity than the

storage vessel it is replacing in a tank battery. We therefore solicit comment on how often a storage vessel in a tank battery is replaced with one that is of bigger capacity, or whether the need to increase a tank battery's capacity is generally accomplished by adding storage vessels as opposed to replacing an existing one with a bigger one. We further solicit comment on whether, under our proposed definition of a tank battery (*i.e.,* a single storage vessel or a group of storage vessels that are physically adjacent and that receive fluids from the same source (*e.g.,* well, process unit, or set of wells or process units)), the replacement of a storage vessel in a tank battery should also require the assessment of the potential VOC and methane emissions from the tank battery.

Item 3 will increase the volumetric throughput of the tank battery relative to the throughput prior to storage of the additional fluid. This will increase the working losses and potentially increase the flashing losses from the tank battery, depending on the properties of the new fluid stream. In any event, adding a new fluid stream to an existing tank battery increases the VOC emissions from that tank battery relative to just prior to the addition of a new fluid stream and is therefore considered a modification of the tank battery.

The EPA is proposing to require that the owner or operator recalculate the potential VOC emissions when any of these actions occur on an existing single storage vessel or tank battery to determine if the modification may require control of VOC emissions. The existing single storage vessel or tank battery will only become subject to the proposed NSPS if it is modified pursuant to this proposed definition of modification and its potential VOC emissions exceed the proposed 6 tpy VOC emissions threshold for the tank battery.

d. Technology Review

The available control techniques for reducing methane and VOC emissions from storage vessels include routing the emissions from the storage vessels to a combustion control device or a VRU, which would route the emission to a process (including a gas sales line). These are the same control systems that were evaluated under the 2012 NSPS OOOO. While floating roofs can also be used to reduce emissions from many storage vessel applications, including at natural gas processing plants and compressor stations, floating roofs are not effective at reducing emissions from storage vessels that have flashing losses (*e.g.,* storage vessels at well sites or centralized production facilities). Besides the control options described above, we did not find other available control options through our review, including review of the RACT/BACT/LAER Clearinghouse.

In the development of the 2012 NSPS OOOO, we found that using either a VRU or a combustion control device could achieve a 95 percent or higher VOC emission reduction efficiency. Available information since then continues to support that such devices can achieve a 95 percent control efficiency for both methane and VOC emissions. We are not proposing to require higher control efficiency because, in order to achieve a minimum of 95 percent control efficiencies on a continuous basis, operators will need to design and operate the control to achieve greater than 95 percent. Thus, while the control device may commonly operate at greater than 95 percent control efficiencies, there may be process fluctuations in heat loads, inlet backpressure, and other variables that may affect performance that may lower the control efficiencies achieved. For example, there are field conditions, such as high winds that may

influence combustion efficiencies.[250] We also note that, while the EPA established operating and monitoring requirements to ensure flares achieve a 98 percent control efficiency at petroleum refineries in 40 CFR part 63, subpart CC, these requirements include sophisticated monitoring and operational controls and tend to lead to additional fuel use and greater secondary impacts than combustion systems targeting to achieve a minimum of 95 percent control efficiency. Considering these factors, we conclude that, consistent with CAA section 111(a) definition of a "standard of performance," 95 percent control efficiency as the minimum allowable control efficiency at any time continues to reflect "the degree of emission limitation achievable" through the application of the BSER for tank batteries (a combustor or a VRU). We solicit comment on the issues described above for requiring higher than 95 percent reduction.[251]

During pre-proposal outreach, some small businesses raised a concern that the NSPS OOOOa requirement for a continuous pilot light for a storage vessel control device generated more emissions than it prevented for storage vessels with low emissions. Specifically, small business representatives raised concerns that there are situations where propane or other fossil fuel must be used to maintain continuous pilot lights for flares used as control devices on storage vessels that do not produce enough emissions. The EPA is interested in whether the benefits of reducing emissions with these control devices are negated by the need to burn additional fossil fuels and whether there are additional factors that lead to variability in emissions from storage

[250] EPA. April 2012. *Parameters for Properly Designed and Operated Flares*. Prepared for U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC.

[251] Further, in section XIII.E (solicitation of comment on control device efficiency), the EPA solicits comment on the level of reduction that can be reliably achieved using a flare and what measures need to be in place to assure such reduction.

vessels that could be used to more narrowly target these requirements to limit the unnecessary operation of flares. We are soliciting comment from all stakeholders on this issue.

e. Control Options and BSER Analysis

For this proposal, the EPA evaluated regulatory options based on different potential emissions thresholds for VOC and methane. We assumed the potential tank battery emissions were reduced by 95 percent using either a VRU or a combustion control device. Since VRUs recover saleable products, we also estimated the value of the recovered product when VRUs were used. The EPA encourages the use of VRUs to capture and sell the emissions from the storage vessels by classifying VRUs as part of the process, therefore emission recovered would not be included in the potential emissions at a site.

For new, modified, or reconstructed sources, we evaluated the cost of control using a single combustion device (or VRU) on a single storage vessel as well as a tank battery made up of multiple storage vessels. To do this, we evaluated the use of a single control device achieving 95 percent reduction of VOC and methane emissions at the following potential emission thresholds: 6 tpy VOC from a single storage vessel; 3 and 6 tpy VOC from a tank battery; and 1.3 tpy, 5.3 tpy, 20 tpy, and 50 tpy methane from a tank battery. Based on our cost analysis we propose to retain the 6 tpy applicability threshold.

The estimated all-in capital costs for a single combustion control device are approximately $80,000. The estimated annualized costs include the capital recovery cost (calculated at a 7 percent interest rate for 15 years) and labor costs for operations and maintenance and are estimated at approximately $31,500/yr. The estimated capital costs for a VRU sized for a source with potential VOC emissions of 6 tpy are approximately $32,000 and

the estimated annualized costs are estimated at approximately $24,000/yr not considering any potential recovery credits from sales. More information on this cost analysis is available in the NSPS OOOOb and EG TSD for this proposal.

Based on our analysis, the cost effectiveness of controlling VOC and methane emissions from a tank battery with the potential for VOC emissions of 6 tpy, under the single pollutant approach where all the costs are assigned to the reduction of VOC, is $5,540 per ton of VOC eliminated assuming the use a single combustion control device. As explained above, storage vessels are commonly located adjacent to one another as part of tank battery, which allows the vapors from the storage vessels within the tank battery to be collected and routed to a single control device, when one is used. The single pollutant cost effectiveness for a VRU to control a tank battery with potential VOC emissions of 6 tpy is approximately $4,000 per ton of VOC eliminated. As shown in section IX, costs ranging from $4,000 to $5,540 per ton of VOC reduced are within the range that the EPA considers to be cost effective for reducing VOC emissions. Because it is cost effective to reduce the VOC emissions from a tank battery with potential VOC emissions of 6 tpy or greater, one of the two targeted pollutants in this action, it is cost effective to reduce both VOC and methane emissions from a single storage vessel or a tank battery at that level. Based on our estimate, a tank battery with potential 6 tpy VOC emissions has potential 1.3 tpy of methane emissions. Because storage vessels contain crude oil, condensate, intermediate hydrocarbons, or produced water, which are approximately 80 percent VOC, the methane emissions from storage vessels are generally less than the VOC emissions.

We also evaluated the cost effectiveness at a lower VOC threshold of 3 tpy. As shown in the NSPS OOOOb and EG TSD, the single pollutant cost effectiveness for controlling a tank

battery with potential emissions of 3 tpy ranges from $7,500 to $11,000. As shown in section IX, costs ranging from $7,500 to $11,000 per ton of VOC reduced is not within the range that the EPA considers to be cost effective for reducing VOC emissions. Using the multipollutant approach, the VOC cost effectiveness is between $3,800 and $5,500, which is considered reasonable, but the methane cost effectiveness is between $17,000 and $25,000 for any of the methane thresholds assessed in conjunction with 3 tpy VOC limit, which is considered unreasonable. Therefore, the 3 tpy VOC control option was not considered reasonable at this time using either the single pollutant or multipollutant approach.

Our analysis also shows that, under the single pollutant approach where all the costs are assigned to the reduction of methane and zero to VOC, it is cost effective to control a single storage vessel or a tank battery with potential methane emissions of 20 tpy (at costs ranging from $1,250 to $1,660 per ton methane). Based on our estimate, a tank battery with potential methane emissions of 20 tpy would have the potential VOC emissions of 91 tpy, 95 percent of which would be reduced at zero cost. Under the multipollutant cost-effectiveness approach, where half of the cost is allocated to methane reduction and the other half to VOC reduction, it is cost effective to control a tank battery with potential methane emissions of 10 tpy and corresponding potential VOC emissions of 46 tpy, at an average cost of $1,500 per ton methane reduced and $330 per ton VOC reduced. In light of the above, 6 tpy of VOC is the lowest threshold that is cost effective to control both VOC and methane emissions. Therefore, the EPA is proposing to define the affected facility for purposes of regulating both VOC and methane emissions as a tank battery with potential VOC emissions of 6 tpy or greater.

2. EG OOOOc

The EPA is proposing presumptive standards for reducing methane emissions from existing storage vessels. For purposes of the EG, we are proposing to define a designated facility as a single storage vessel or tank battery with the potential for methane emissions of 20 tpy or greater. For purposes of the EG, we are proposing the same definition of a storage vessel affected facility, which is a single storage vessel or a group of storage vessels that are physically adjacent and that receive fluids from the same source (*e.g.,* well, process unit, or set of wells or process units).

The available controls for reducing methane emissions from existing tank batteries are the same as those for reducing methane and VOC emissions from new, modified and reconstructed tank batteries. In assessing the control costs for existing sources, we applied a 30 percent retrofit factor to the capital and installation costs to account for added costs of manifolding existing storage vessels and installing the control system on an existing tank battery. When applying controls to new sources, there is limited additional costs in designing the fixed roof with fittings to manifold the vapors and installing the closed vent piping or ducts during the tank installation process. For existing sources, installing fittings on an existing tank may require special lifts to access the roof and cut new ports in the roof. This may also require the tank to be taken out of service to conduct these installations, which requires additional time and labor. Additionally, when installing controls as part of the design for a new source, the facility layout can be designed to accommodate the control systems near the tank battery and the control device can be installed with the same crew installing the storage vessels, minimizing additional installation costs. For existing sources, there may be other equipment near the tanks that may require the control equipment to be further from the tank battery, which increases materials and

installation costs. Also, control equipment costs will include the full costs of crew mobilization. Therefore, it is more expensive to install controls at an existing tank battery than to install controls as part of a new tank battery. We considered the same regulatory options based on potential methane emissions thresholds of 1.3 tpy, 5.3 tpy, 20 tpy, and 50 tpy per tank battery.

The estimated capital costs for a single combustion control device for emissions in this range are approximately $103,000. The estimated annual costs include the capital recovery cost (calculated at a 7 percent interest rate for 15 years) and labor costs for operations and maintenance and are estimated at approximately $34,000. The costs for VRU are more variable than combustion control systems and dependent on the potential emissions for which the VRU is designed to recover. The estimated capital costs for a VRU sized for a source with potential methane emissions of 20 tpy device are approximately $106,000 and the estimated annualized costs are approximately $49,000/yr not considering any potential recovery credits. With a VRU, the recovered VOC and methane are recovered as salable products. Considering the value of recovered product, the annualized cost for VRU sized to recover potential methane emissions of 20 tpy is estimated to be $26,000/yr. More information on this cost analysis is available in the NSPS OOOOb and EG TSD for this proposal.

The resulting cost effectiveness, for the application of a single combustion control device or VRU to achieve a 95 percent emission reduction ranges from $19,000 to $27,400 per ton of methane eliminated at a threshold of 1.3 tpy methane. This cost is not considered reasonable. Next, we evaluated the cost effectiveness at a methane threshold of 5.3 tpy, which ranged from $10,000 to $13,700 per ton of methane reduced, which is also not considered reasonable. At a threshold of 20 tpy methane, the cost effectiveness ranges from $1,400 to $1,800 per ton

methane reduced. At a threshold of 50 tpy methane, the cost effectiveness ranges from $340 to $720 per ton methane reduced. When we considered the application of these options at a national level, the overall cost effectiveness of the 20 tpy potential methane emissions threshold was $400 per ton methane reduced without considering product recovery credits and has a net cost savings considering product recovery credits. Additionally, the incremental cost effectiveness of the 20 tpy option relative to the 50 tpy potential methane emissions threshold was approximately $900 per ton additional methane reduced when considering product recovery credits.

Based on the cost analysis summarized above, we find that the cost effectiveness for achieving 95 percent emission reduction of methane from a tank battery with potential methane emissions of 20 tpy is reasonable for methane. A cost-effective value of $1,800/ton of methane reduction is comparable to the estimated methane cost-effectiveness values for the controls identified as BSER for the 2016 NSPS OOOOa and which we consider to be representative of reasonable control cost for reducing methane emissions from the Crude Oil and Natural Gas source category, as explained in section IX.B. We further note that both California and Colorado require 95 percent reduction of methane (California) and hydrocarbon (Colorado) emissions from storage vessels. For California, existing separator and tank systems with an annual emission rate greater than 10 tpy methane must control emissions using a vapor collection system that reduces emissions by at least 95 percent.[252] For Colorado, storage vessels that emit greater than or equal to 2 tpy of actual uncontrolled VOC emissions must reduce VOC emissions by 95

[252] See sections 95668 and 95671 of California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4.

percent.[253] These requirements, which are comparable to the proposed presumptive standards, are further indication that the cost of implementing the proposal is reasonable and not excessive.

3. Legally and Practicably Enforceable Limits

In addition to the BSER analysis described above, the EPA is clarifying the term "legally and practicably enforceable limits" as it related to storage vessel affected facilities in the proposed NSPS OOOOb and EG OOOOc. In the 2016 NSPS OOOOa, the EPA stated that "any owner or operator claiming technical infeasibility, nonapplicability, or exemption from the regulation has the burden to demonstrate the claim is reasonable based on the relevant information. In any subsequent review of a technical infeasibility or nonapplicability determination, or a claimed exemption, the EPA will independently assess the basis for the claim to ensure flaring is limited and emissions are minimized, in compliance with the rule." See 81 FR 35824, 35844 (June 3, 2016).

In the context of storage vessels under both the 2012 NSPS OOOO and 2016 NSPS OOOOa, the EPA has learned that numerous owners and operators claim that their storage vessels are not affected facilities under 40 CFR 60.5365(e) and 40 CFR 60.5365a(e). This claim is made based on a determination that the potential for VOC emissions is less than 6 tpy when taking into account requirements under a legally and practicably enforceable limit in an operating permit or other requirement established under a Federal, State, local or Tribal

[253] See section I.D.3.a of Colorado Department of Public Health and Environment, ''Control of Ozone via Ozone Precursors and Control of Hydrocarbons via Oil and Gas Emissions (Emissions of Volatile Organic Compounds and Nitrogen Oxides), Regulation Number 7'' (5 CCR 1001–9), July 2021.

authority.[254] However, when the EPA has reviewed the limits considered by these facilities as legally and practicably enforceable, we have become aware that the limits do not require a reduction in emissions; they are often self-imposed or of such a general nature as to be unenforceable or otherwise lack measures to assure the required emission reduction. For example, a permit contains an emission limit of 2 tpy for a single storage vessel, but does not contain any performance testing requirements, continuous or other monitoring requirements, recordkeeping and reporting, or other requirements that would ensure that emissions are maintained below the emissions limit in the permit. In *National Mining Ass'n v. EPA*, 59 F.3d 1351 (D.C.Cir.1995), the court explained what constitutes "effective" control in assessing a source's potential to emit. According to the court, while "effective" controls need not be Federally enforceable, "EPA is clearly not obliged to take into account controls that are only chimeras and do not really restrain an operator from emitting pollution." *Id.* at 1362. The court also emphasized that these non-Federally enforceable controls must stem from state or local government regulations, and not "operational restrictions that an owner might voluntarily adopt." *Id.* at 1362. Further, as a general "default rule," the burden of proof falls "upon the party seeking relief." *Schaffer ex rel. Schaffer v. Weast*, 546 U.S. 49, 57–58, 126 S.Ct. 528, 163 L.Ed.2d 387 (2005).

In light of the above, the EPA is proposing to include a definition for a "legally and practicably enforceable limit" as it relates to limits used by owners and operators to determine the potential for VOC emissions from storage vessels that would otherwise be affected facilities

[254] 40 CFR 60.5365(e) and 40 CFR 60.5365a(e)(1) and (2) allow owners and operators to take into account these requirements when calculating the potential VOC emissions.

under these rules. The intent of this proposed definition is to provide clarity to owners and operators claiming the storage vessel is not an affected facility in the Oil and Gas NSPS due to legally and practicably enforceable limits that limit their potential VOC emissions below 6 tpy. This definition is being proposed for NSPS OOOOb and the proposed presumptive standard included in EG OOOOc. This proposed definition of "legally and practicably enforceable limit" is consistent with the EPA's historic position on what is considered "legally and practicably enforceable," as tailored to storage vessels in the oil and gas sector that would otherwise be affected facilities under these rules. The proposed definition is as follows:

"For purposes of determining whether a single storage vessel or tank battery is an affected facility, a legally and practicably enforceable limit must include all of the following elements:

i. A quantitative production limit and quantitative operational limit(s) for the equipment, or quantitative operational limits for the equipment;

ii. an averaging time period for the production limit in (i) (if a production-based limit is used) that is equal to or less than 30 days;

iii. established parametric limits for the production and/or operational limit(s) in (i), and where a control device is used to achieve an operational limit, an initial compliance demonstration (*i.e.*, performance test) for the control device that establishes the parametric limits;

iv. ongoing monitoring of the parametric limits in (iii) that demonstrates continuous compliance with the production and/or operational limit(s) in (i);

v. recordkeeping by the owner or operator that demonstrates continuous compliance with

the limit(s) in (i-iv); and

vi. periodic reporting that demonstrates continuous compliance."

In this proposed definition, the EPA is not addressing the various ways in which a State or other authority's permit may be issued since the format of permit issuances varies by jurisdiction. The proposed definition of "legally and practicably enforceable" does not specify limits, monitoring requirements, or recordkeeping. Instead, the owner or operator should work with the permitting authority to establish specific limits, monitoring requirements and recordkeeping that will ensure any permitted emission limit is achieved. Only those limits that include the elements described above will be considered "legally and practicably enforceable" for purposes of determining the potential for VOC emissions from a single storage vessel or tank battery, and thus applicability (or non-applicability) of each single storage vessel or tank battery as an affected facility under the rule.

This proposed definition will provide clarity to owners and operators in what limits are necessary to ensure they have appropriately determined their single storage vessels or tank batteries are affected facilities under the proposed NSPS OOOOb or designated facilities under the proposed EG OOOOc. Further, as stated in the 2016 NSPS OOOOa, well-designed rules ensure fairness among industry competitors and are essential to the success of future enforcement efforts. 81 FR 35844 (June 3, 2016). The EPA is soliciting comment on this proposed definition from all stakeholders.

C. Proposed Standards for Pneumatic Controllers

1. NSPS OOOOb

a. Background

In the 2012 NSPS OOOO, the EPA established VOC standards for natural gas-driven pneumatic controllers. Specifically, subpart OOOO established a natural gas bleed rate limit of 6 scfh for individual, continuous bleed, natural gas-driven controllers located in the production segment. Continuous bleed, natural gas-driven controllers with a bleed rate of 6 scfh or less are commonly called "low bleed" controllers. However, that rule also allowed for the use of "high bleed" controllers (those with a bleed rate over 6 scfh) where required by functional needs such as response time, safety, and positive actuation. At natural gas processing plants, subpart OOOO implemented a VOC standard that required a bleed rate of zero ("zero bleed" or "no bleed"). The rule also included allowances for the use of continuous bleed natural gas-driven controllers at natural gas processing plants where required by functional needs.

In the 2016 NSPS OOOOa, the EPA extended the 6 scfh natural gas bleed rate standard to the natural gas transmission and storage segment and established GHG standards for all segments. Effectively, the 2016 NSPS OOOOa required low bleed controllers to reduce methane and VOC emissions from the production and transmission and storage segments and required a bleed rate of zero for pneumatic controllers at natural gas processing plants. Like the 2012 NSPS OOOO, the 2016 NSPS OOOOa included allowances for the use of continuous high bleed controllers in the production and transmission and storage segments and continuous natural gas-driven pneumatic controllers at natural gas processing plants where required by functional needs.

Emissions from natural gas-driven intermittent vent pneumatic controllers were not addressed in either the 2012 NSPS OOOO or the 2016 NSPS OOOOa. This was because, when operated and maintained properly, methane and VOC emissions from intermittent controllers are substantially lower (by an order of magnitude) than emissions from other types of natural gas-

driven controllers. However, the EPA is now aware that these intermittent controllers often malfunction and vent during idle periods. Emissions factors considering this fact are around four times higher than the factors for low-bleed controllers. Further, as presented in subsection c of this section, methane emissions from intermittent controllers make up a significant portion of the overall methane emissions from all natural gas and petroleum system sources in the GHGI. As such, the EPA is now proposing to reduce emissions from intermittent controllers via NSPS OOOOb.

b. Affected Facility Definitions and Zero Emissions Standard

As a result of the review of these requirements in the 2016 NSPS OOOOa, the previous BSER determinations, and the consideration of new information, including State regulations that have been enacted since 2016, the EPA is proposing GHG (methane) and VOC standards for natural gas-driven pneumatic controllers in all segments of the industry included in the Crude Oil and Natural Gas source category (*i.e.*, production, processing, transmission and storage).

First, in terms of the definition of an affected facility, the EPA is proposing to revise the types of pneumatic controllers that are affected facilities to include both continuous bleed controllers and intermittent vent controllers. For continuous bleed controllers, an affected facility is each single continuous bleed natural gas-driven pneumatic controller that vents to the atmosphere. For intermittent vent controllers, an affected facility is each single natural gas-driven pneumatic controller that is not designed to have a continuous bleed rate but is designed to only release natural gas to the atmosphere as part of the actuation cycle. These affected facility definitions apply for pneumatic controllers in both the production and transmission and storage segments, as well as for those at natural gas processing plants.

Next, in terms of standards, we are proposing a requirement that all controllers (continuous bleed and intermittent vent) in the production and natural gas transmission and storage segments must have a methane and VOC emission rate of zero. Controllers that emit zero methane and VOC to the atmosphere can include, but are not limited to, air-driven pneumatic controllers (also referred to as instrument air-driven or compressed air-driven controllers), mechanical controllers, electronic controllers, and self-contained natural gas-driven pneumatic controllers. While these "zero-emissions controllers" would not technically be affected facilities because they are not driven by natural gas (air-driven, mechanical, and electronic) or because they do not vent to the atmosphere, owners and operators should maintain documentation if they would like to be able to demonstrate to permit writers or enforcement officials that there are no methane or VOC emissions from the controllers and that these controllers are not affected facilities and are not subject to the rule. The proposed standard would apply to both continuous bleed and intermittent vent controllers at these sites.

For all natural gas processing plants, we are proposing to essentially retain the 2016 NSPS OOOOa standard that requires that controllers must have a methane and VOC emission rate of zero (*i.e.*, zero-emissions controllers must be used). However, we are proposing to slightly change the wording of the standard from subparts OOOO and OOOOa, which require a "bleed rate of zero." Many natural gas processing plants use pneumatic controllers that are powered by compressed air, which can technically have a compressed air bleed rate greater than zero. Put another way, some controllers that are powered with compressed air can allow some of that compressed air to leave the controller and thus be released into the atmosphere (they can "bleed" compressed air). However, since the compressed air does not contain any natural gas,

methane, or VOC, we are clarifying the standard by proposing to require that pneumatic controllers at natural gas processing plants have a methane and VOC emission rate of zero.

In both NSPS OOOO and OOOOa, there is an exemption from the standards in cases where the use of a pneumatic controller affected facility with a bleed rate greater than the applicable standard is required based on functional needs, including but not limited to response time, safety, and positive actuation. The EPA is not maintaining this exemption in the proposed NSPS OOOOb, except for in very limited circumstances explained below. As discussed below, the reasons to allow for an exemption based on functional need in NSPS OOOO and OOOOa were based on the inability of a low-bleed controller to meet the functional requirements of an owner/operator such that a high-bleed controller would be required in certain instances. Since we are now proposing that pneumatic controllers have a methane and VOC emission rate of zero, we do not believe that the reasons related to the use of low bleed controllers are still applicable.

The proposed rule also does include an exemption from the zero-emission requirement for pneumatic controllers in Alaska at locations where electricity power is not available. In these situations, the proposed standards would require the use of a low-bleed controller instead of high-bleed controller. The proposed rule also includes the exemption for pneumatic controllers in Alaska at sites without power that would allow the use of high-bleed controllers instead of low-bleed based on functional needs. In addition, inspections of intermittent vent controllers to ensure they are not venting during idle periods described above would also be required at sites in Alaska without power.

c. Description

Pneumatic controllers are devices used to regulate a variety of physical parameters, or

process variables, using air or gas pressure to control the operation of mechanical devices, such as valves. The valves, in turn, control process conditions such as levels, temperatures and pressures. When a pneumatic controller identifies the need to alter a process condition, it will open or close a control valve. In many situations across all segments of the Oil and Natural Gas Industry, pneumatic controllers make use of the available high-pressure natural gas to operate or control the valve. In these "natural gas-driven" pneumatic controllers, natural gas may be released with every valve movement (intermittent) and/or continuously from the valve control. Pneumatic controllers can be categorized based on the emissions pattern of the controller. Some controllers are designed to have the supply-gas provide the required pressure to power the end-device, and the excess amount of gas is emitted. The emissions of this excess gas are referred to as "bleed," and this bleed occurs continuously. Controllers that operate in this manner are referred to as "continuous bleed" pneumatic controllers. These controllers can be further categorized based on the rate of bleed they are designed to have. Those that have a bleed rate of less than or equal to 6 scfh are referred to as "low bleed," and those with a bleed rate of greater than 6 scfh are referred to as "high bleed." Another type of controller is designed to release gas only when the process parameter needs to be adjusted by opening or closing the valve, and there is no vent or bleed of gas to the atmosphere when the valve is stationary. These types of controllers are referred to as "intermittent vent" pneumatic controllers. A third type of natural gas-driven controller releases gas to a downstream pipeline instead of the atmosphere. These "self-contained" types of controllers can be used in applications with very low pressure.

As discussed above, emissions from natural gas-powered pneumatic controllers occur as a function of their design. Self-contained controllers do not emit natural gas to the atmosphere.

Continuous bleed controllers using natural gas as the power source emit a portion of that gas at a constant rate. Intermittent vent controllers using natural gas as the power source are designed to emit natural gas only when the controller sends a signal to open or close the valve, which is called actuation. From continuous bleed and intermittent vent controllers, another source of emissions is from improper operation or equipment malfunctions. In some instances, a low bleed controller may emit natural gas at a higher level than it is designed to do (*i.e.*, over 6 scfh) or an intermittent vent controller could emit continuously or near continuously rather than only during actuation.

Not all pneumatic controllers are driven by natural gas. At sites with power, electrically powered pneumatic devices or pneumatic controllers using compressed air can be used. As these devices are not driven by pressurized natural gas, they do not emit any natural gas to the atmosphere, and consequently, they do not emit VOC or methane to the atmosphere. In addition, some controllers operate mechanically without a power source or operate electronically rather than pneumatically. At sites without electricity provided through the grid or on-site electricity generation, mechanical controllers and electronic controllers using solar power can be used.

The emissions from natural gas-powered pneumatic controllers represent a significant portion of the total emissions from the Oil and Natural Gas Industry. In the 2021 GHGI, the estimated methane emissions for 2019 from pneumatic controllers were 700,000 metric tons of methane for petroleum systems and 1.4 million metric tons for natural gas systems. These levels represent 45 percent of the total methane emissions estimated from all petroleum systems (*i.e.,* exploration through refining) sources and 22 percent of all methane emissions from natural gas systems (*i.e.,* exploration through distribution). The vast majority of these emissions are from

natural gas-driven intermittent vent controllers, which the EPA is proposing to define as an affected facility for the first time in NSPS OOOOb. Of the combined methane emissions from pneumatic controllers in the petroleum systems and natural gas systems production segments, emissions from intermittent vent controllers make up 88 percent of the total. Continuous high bleed and low bleed controllers make up 8 and 4 percent, respectively.

d. Control Options

In identifying control options for this NSPS OOOOb proposal, we re-examined the options previously evaluated in the rulemakings to promulgate the 2012 NSPS OOOO and the 2016 NSPS OOOOa, and also examined State rules with requirements for pneumatic controllers that achieve emission reductions beyond those achieved by NSPS OOOOa. For NSPS subparts OOOO and OOOOa, we identified options for reducing emissions from continuous bleed natural gas-driven pneumatic controllers. These options included using low bleed controllers in place of high bleed controllers, enhanced maintenance (*i.e.*, periodic inspection and repair), and using zero-emissions controllers. For the production and transmission and storage segments, only the option to require low bleed controllers was fully analyzed in these previous analyses. Based on the EPA's determination at that time that electricity was "likely unavailable" at production and transmission and storage sites, the EPA did not fully consider instrument air or electronic controllers. The EPA also did not evaluate enhanced maintenance, as it was concluded that the highly variable nature of determining the proper methods of maintaining a controller could incur significant costs. The EPA did not evaluate options to reduce emissions from intermittent vent controllers in either the 2012 or 2016 NSPS.

Three U.S. States (California, Colorado, and New Mexico) and two Canadian provinces

(Alberta and British Columbia) have rules or proposed rules that achieve emission reductions beyond those achieved by NSPS OOOOa. Starting on January 1, 2019, and subject to certain exceptions, a California rule requires that all new and existing continuous bleed devices must not vent natural gas to the atmosphere. The rule allows low bleed devices installed prior to January 1, 2016, to continue to operate, provided that annual testing is performed to verify that the low bleed rate is maintained. A Colorado rule adopted in February 2021, requires that all new controllers are no-bleed controllers (which includes self-contained natural gas-driven controllers), and over a period of two years, a sizeable portion of existing controllers must be retrofit to have a natural gas bleed rate of zero. New Mexico has proposed a rule that would require an emission rate of zero from all controllers located at sites with access to electrical power. The Canadian provinces of Alberta (effective 2022) and British Columbia (effective 2021) also regulate emissions from pneumatic controllers. In British Columbia, pneumatic devices that emit natural gas must not be used at new sources and at existing gas processing plants and large compressor stations, and in Alberta, owners and operators must prevent or control (by 95 percent) vent gas from new pneumatic controllers. While the terminology differs across these regulations, the EPA believes that all these requirements (with the exception of the 95 percent reduction requirement in Alberta) are very similar to if not the same as the zero methane and VOC emission requirement being proposed by the EPA for NSPS OOOOb.

From EPA's review of our past BSER analysis as well as reviewing these other rules, several options were identified for the BSER analysis for NSPS OOOOb to reduce methane and/or VOC emissions from natural gas-driven pneumatic controllers. These include the following: (1) Use of low bleed natural gas-driven pneumatic controllers in the place of high

bleed natural gas-driven pneumatic controllers; (2) require zero emissions from intermittent vent controllers except during actuation, and (3) prohibit the emissions of methane and VOC from all pneumatic controllers (*i.e.*, establish a zero methane and VOC emission standard for both continuous bleed and intermittent bleed controllers).

e. 2021 BSER Analysis

Production and Transmission and Storage Segments.

For production and transmission and storage sites, the EPA evaluated two options. The first was an option to require the use of low bleed natural gas-driven pneumatic controllers in the place of high bleed natural gas-driven pneumatic controllers, along with a requirement that natural gas-driven intermittent vent pneumatic controllers only discharge natural gas during actuation. We also evaluated an option of establishing a zero methane and VOC emissions standard, which we propose to determine represents the BSER for production and natural gas transmission and storage sites.

The first option evaluated was the use of low bleed natural gas-driven pneumatic controllers in the place of high bleed natural gas-driven pneumatic controllers. In the analysis of this option, we examined the emissions reduction potential, the cost of implementation, and the cost effectiveness in terms of cost per ton of emissions eliminated.

The emission reduction potential of using a low bleed controller in place of a high bleed controller depends on the actual bleed rate of each device, which varies from device to device. Using average emission factors for each device type, the difference in emissions can be estimated on a per-controller basis. We estimated this difference between a low bleed and a high bleed device to be an 84 percent reduction for controllers in the production segment and a 92

percent reduction in emissions in the transmission and storage segment, equating to a difference of 2.1 tpy methane and 0.6 tpy VOC per controller in the production segment and 2.9 tpy methane and 0.08 tpy VOC per controller in the transmission and storage segment. The cost of a new low bleed natural gas-driven pneumatic controller is approximately $255 higher than the cost of a new high bleed device. On an annualized basis, assuming a 15-year equipment lifetime and a 7 percent interest rate, the cost is $28 per year per low bleed controller. Under the single pollutant approach where all the costs are assigned to the reduction of one pollutant, the estimated cost effectiveness is $13 per ton of methane avoided and $48 per ton of VOC avoided per controller in the production segment. Using the multipollutant approach where half the cost of control is assigned to the methane reduction and half to the VOC reduction, the estimated cost effectiveness is $7 per ton of methane avoided and $24 per ton of VOC avoided. When considering the cost of saving the natural gas that would otherwise be emitted for the production segment, the cost effectiveness shows an overall savings under both the single pollutant and multipollutant approaches. For the natural gas transmission and storage segment, the cost effectiveness is $10 per ton methane avoided and $355 per ton VOC avoided per controller using the single pollutant method, and $5 per ton of methane and $178 per ton of VOC avoided per controller using the multipollutant method. Transmission and storage facilities do not own the natural gas; therefore, revenues from reducing the amount of natural gas emitted/lost was not applied for this segment. These values are well within the range of what the EPA considers to be reasonable for methane and VOC using both the single pollutant and multipollutant approaches.

We also evaluated a requirement that natural gas-driven intermittent vent pneumatic controllers only discharge natural gas during actuations. This emissions reduction option would

be required in conjunction with a requirement to use low bleed controllers in place of high bleed controllers. The average emission factor determined by an industry study for natural gas-driven intermittent vent controllers, including both properly and improperly operating controllers, is 9.2 scfh natural gas.[255] Comparing this to the emission factor for a properly operating intermittent vent controller of 0.3 scfh natural gas illustrates the significant potential for reductions from a program that identifies intermittent vent controllers that are improperly operating and repairing, replacing, or altering their operating conditions so they may function properly. To ensure these devices are emitting natural gas only during actuations in accordance with their design, there would be no equipment expenditure or associated capital costs; however, emissions monitoring or inspections, combined with repair as needed, would be necessary to ensure this proper operation is achieved. We considered requiring independent inspections specifically for intermittent vent controllers but concluded that it would be more efficient to couple inspections of these controllers with the inspections of equipment for leaks under the fugitive monitoring program (see section XII.A of this preamble).

The second option we evaluated was a zero methane and VOC emissions standard. While applicability of both the 2012 NSPS OOOO and the 2016 NSPS OOOOa are based on an individual pneumatic controller (as is the proposed definition of affected facility under NSPS OOOOb), zero-emissions controller options are more appropriately evaluated as "site-wide" controls. While individual natural gas-driven pneumatic controllers can be switched to other types of natural-gas driven pneumatic controllers (*e.g.*, high bleed to low bleed types or low

[255] API Field Measurement Study: "Pneumatic Controllers EPA Stakeholder Workshop on Oil and Gas." November 7, 2019 -Pittsburg PA. Paul Tupper.

bleed to self-contained), the implementation of some zero-emissions controllers options would require equipment that would presumably be used for all the controllers at the site. For example, in order to utilize instrument air driven controllers, a compressor and related equipment would need to be installed. For the vast majority of situations, the EPA does not believe that an owner and operator would install a compressor just for a single controller, but rather would instead install a site-wide system to provide compressed air to all the controllers at the site. Therefore, to adequately account for the costs of the system, including the controllers and the common equipment, we evaluated these zero-emissions controller options using "model" plants.

These model plants include assumptions regarding the number of each type of pneumatic controller at a site. Emissions were estimated for each of the model plants using a calculation based on of the number of controllers at the plant and emission factors for each controller. Three sizes of model plants (*i.e.*, small, medium, and large) were developed and used for both the production and transmission and storage segments. Each model plant contained one high bleed natural gas-driven controller and increasing numbers of low bleed and intermittent natural gas-driven controllers. For the production segment, the controller-specific emission factors used are from a recent study conducted by the American Petroleum Institute,[256] and are 2.6 scfh, 16.4 scfh, and 9.2 scfh total natural gas emissions for low bleed, high bleed, and intermittent bleed controllers, respectively. This API study did not cover the transmission and storage segment; therefore, the emission factors from GHGRP subpart W were used, which are 1.37 scfh, 18.2 scfh, and 2.35 scfh for low bleed, high bleed, and intermittent bleed controllers, respectively. It

[256] API Field Measurement Study: "*Pneumatic Controllers EPA Stakeholder Workshop on Oil and Gas.*" November 7, 2019 -Pittsburgh PA. Paul Tupper.

was assumed that the portion of natural gas that is methane is 82.9 percent in the production segment and 92.8 percent in the transmission and storage segment. Further, it was assumed that VOCs were present in natural gas at a certain level compared to methane. The specific ratios assumed were 0.278 pounds VOC per pound methane in the production segment and 0.0277 pounds VOC per pound methane in the transmission and storage segment. This information results in estimated emissions for a single natural gas-driven pneumatic controller in the production segment of 0.39, 2.48, and 1.39 tpy methane and 0.1, 0.7, and 0.4 tpy VOC per low bleed, high bleed, and intermittent vent controller, respectively. The emissions for a single natural gas-driven pneumatic controller in the transmission and storage segment are 0.23, 3.08, and 0.40 tpy methane and 0.006, 0.08, and 0.01 tpy VOC per low bleed, high bleed, and intermittent vent controller, respectively.

Based on the factors described above and the number of each type of controller in each model plant, baseline emissions for the model plants were calculated. For the production model plants, the baseline emissions were calculated to be 5.7 tpy methane and 1.6 tpy VOC for the small model plant (assumes fewer controllers on site than medium plant), 11.2 tpy methane and 3.1 tpy VOC for the medium model plant (assumes more controllers on site than small plant), and 24.9 tpy methane and 6.9 tpy VOC for the large model plant (assumes more controllers on site than the medium plant). For the transmission and storage model plants, the baseline emissions were calculated to be 4.1 tpy methane and 0.1 tpy VOC for the small model plant, 5.7 tpy methane and 0.2 tpy VOC for the medium model plant, and 10.0 tpy methane and 0.3 tpy VOC for the large model plant. For detailed information on the configuration of these model plants and the calculation of the baseline emissions, see the NSPS OOOOb and EG TSD for this

rulemaking, which is available in the docket.

Instrument air controllers and electronic controllers were the two zero emission options evaluated. Both these options require electricity to operate. Instrument air systems use compressed air as the signaling medium for pneumatic controllers and pneumatic actuators, whereas electronic controllers send an electric signal to an electric actuator (rather than sending a pneumatic signal to a pneumatic actuator). As instrument air systems are usually installed at facilities where there is a high concentration of pneumatic control valves, electrical power from the grid, and the presence of an operator that can ensure the system is properly functioning, we evaluated the use of instrument air for the large model plant with more controllers and the use of electronic controllers, which can be powered by solar panels, at the small and medium-sized model plant with less controllers. The emission reduction potential of using these zero-emissions controllers rather than natural-gas-driven pneumatic controllers is 100 percent since these systems eliminate all natural gas emissions (they do not emit any VOC or methane). Based on the information available to the EPA during development of this proposal, these two zero-emissions options were the only two analyzed. The EPA solicits comment on the other potential zero-emission options for these sites (mechanical-only controllers, self-contained natural gas-driven controllers, and natural gas-driven controllers where the emissions are captured and routed to a process).

For the small and medium-sized model plants, the zero-emissions option evaluated was the use of electronic controllers. The respective emissions reduction for small and medium-sized plants would be 5.7 and 11.2 tpy methane and 1.6 and 3.1 tpy VOC in the production segment and 4.1 and 5.7 tpy methane and 0.11 and 0.16 tpy VOC in the transmission and storage

segment. The cost of a new electronic controller system using electricity from the grid or other on-site power generation is estimated to be $26,000 and $46,000, for small and medium-sized plants respectively. The cost of a new solar-powered electronic controller system is estimated to be $28,000 and $52,000, for small and medium-sized plants respectively. The estimated annualized capital costs, assuming a 15-year equipment lifetime and a 7 percent interest rate, are $2,800 and $5,040, respectively for a system powered with electricity from the grid or other power source for small and medium-sized plants, and $3,090 and $5,630, respectively, for a solar-powered system for small and medium-sized plants.

For the production segment, considering the slightly more expensive solar-powered system, under the single pollutant approach, the estimated cost effectiveness is $550 per ton of methane avoided and $1,970 per ton of VOC avoided for a small plant and $500 per ton of methane avoided and $1,810 per ton of VOC avoided for a medium-sized plant. Using the multipollutant approach where half the cost of control is assigned to the methane reduction and half to the VOC reduction, the estimated cost effectiveness is $275 per ton of methane avoided and $980 per ton of VOC avoided for a small plant and $250 per ton of methane avoided and $900 per ton of VOC avoided for a medium-sized plant in the production segment. When considering the cost of saving the natural gas that would otherwise be emitted for the production segment, the cost effectiveness is $370 per ton of methane avoided and $1,320 per ton of VOC avoided for a small plant and $320 per ton of methane avoided and $1,150 per ton of VOC avoided for a medium-sized plant. Using the multipollutant approach, the estimated cost effectiveness is $185 per ton of methane avoided and $660 per ton of VOC avoided for a small plant and $160 per ton of methane avoided and $580 per ton of VOC avoided for a medium-

sized plant in the production segment. These values are well within the range of what the EPA considers to be reasonable for methane and VOC using both the single pollutant and multipollutant approaches.

For the natural gas transmission and storage segment, considering the slightly more expensive solar-powered system, the estimated cost effectiveness is $750 per ton of methane avoided and $27,200 per ton of VOC avoided for a small plant and $990 per ton of methane avoided and $35,700 per ton of VOC avoided for a medium-sized plant. Using the multipollutant approach, the estimated cost effectiveness is $380 per ton of methane avoided and $13,600 per ton of VOC avoided for a small plant and $490 per ton of methane avoided and $17,800 per ton of VOC avoided for a medium-sized plant. Transmission and storage facilities do not own the natural gas; therefore, revenues from reducing the amount of natural gas emitted/lost was not applied for this segment. While the cost effectiveness values for VOC are higher than the range of what the EPA considers to be reasonable for VOC, the cost effectiveness for methane is within the range of what the EPA considers to be reasonable for methane using the single pollutant approach.

For the large model plants, the zero-emissions option evaluated was the use of instrument air systems. For the production segment, the emissions avoided would be 24.9 tpy methane and 6.9 tpy VOC, and in the transmission and storage segment 10.0 tpy methane and 0.3 tpy VOC. The cost of a new instrument air system is estimated to be $96,000 and the estimated annualized capital costs, assuming a 15-year equipment lifetime and a 7 percent interest rate, are $10,500. For the production segment, under the single pollutant approach, the estimated cost effectiveness is $420 per ton of methane avoided and $1,520 per ton of VOC avoided. Using the multipollutant

approach, the estimated cost effectiveness is $210 per ton of methane avoided and $760 per ton of VOC avoided. When considering the cost of saving the natural gas that would otherwise be emitted for the production segment, the cost effectiveness is $240 per ton of methane avoided and $860 per ton of VOC avoided. Using the multipollutant approach, the estimated cost effectiveness is $120 per ton of methane avoided and $430 per ton of VOC avoided in the production segment. These values are well within the range of what the EPA considers to be reasonable for methane and VOC using both the single pollutant and multipollutant approaches.

For the natural gas transmission and storage segment, the estimated cost effectiveness is $1,050 per ton of methane avoided and $38,000 per ton of VOC avoided. Using the multipollutant approach, the estimated cost effectiveness is $530 per ton of methane avoided and $19,000 per ton of VOC avoided. Transmission and storage facilities do not own the natural gas; therefore, revenues from reducing the amount of natural gas emitted/lost was not applied for this segment. While the cost effectiveness values for VOC are higher than the range of what the EPA considers to be reasonable for VOC, the cost effectiveness for methane is within the range of what the EPA considers to be reasonable for methane using the single pollutant approach.

Note that the annual costs for these zero-emissions controllers are based on the annualized capital costs only. While we assume the maintenance costs for electric controllers is less than the costs for natural gas-driven controllers, there are costs associated with the use of electricity that are not incurred for natural gas-driven controllers. We solicit comments on whether such operational costs should be included in these estimates, as well as information regarding these costs.

The capital costs of solar-powered controllers include the cost of the batteries, which

represents around 7 percent of the total cost of a solar-powered system. As noted above, the capital cost was annualized assuming a 15-year lifetime, however batteries for a solar system may have a shorter life. We are soliciting comment on the life of these batteries and, if this life is shorter than 15 years, how the costs of these batteries should be included as a maintenance cost for solar powered systems.

The EPA finds that the cost effectiveness for both the low bleed and zero-emissions options are reasonable for sites in the production and natural gas transmission and storage segments. The incremental cost effectiveness in going from the low bleed option to the zero-emissions option is estimated to be $390 and $340 per ton of additional methane eliminated for small and medium-sized plants ($1,400 and $1,200 per ton of VOC), respectively, in the production segment and $640 and $870 per ton of additional methane eliminated for small and medium-sized plants ($23,000 and $31,500 per ton of VOC), respectively, in the transmission and storage segment. The incremental cost effectiveness in going from the low bleed option to the non-emissions option is estimated to be $260 and $940 per ton of additional methane and VOC avoided, respectively, for large plants in the production segment and to be $940 and $34,000 per ton of additional methane and VOC avoided, respectively, for large plants in the transmission and storage segment. These incremental costs of control do not consider savings for the production segment. The EPA believes the incremental costs of control are reasonable for methane and VOC in the production segment, and for methane in the transmission and storage segment.

As discussed above, several States and Canadian provinces require the use of controllers that do not emit methane or VOC throughout the Oil and Natural Gas Industry, which further

demonstrates the reasonableness of this option and that there are no technical barriers inhibiting the use of electronic controllers or instrument air systems at sites in the production and transmission and storage segments. In 2015, the EPA concluded that, "[a]t sites without available electrical service sufficient to power an instrument air compressor, only gas driven pneumatic devices are technically feasible in all situations." (80 FR 56623, September 18, 2015). However, since that time, at least two States and two Canadian provinces have adopted regulations that require zero emitting controllers at all new sites. The EPA evaluated these rules, and considers these rules, along with the basic understanding that sources in these areas are able to comply with the rules, evidence that the feasibility issues that led to the EPA's previous decision not to require zero emission controllers in 2015 have been overcome. Further, the EPA recognizes that industry commenters on the proposed Colorado rule raised some of the same technical feasibility issues that have been presented to the EPA in the past, including battery storage capacity issues, weather-related issues, and mechanical issues related to vibration.[257] However, despite these issues being raised, Colorado finalized the requirement that new controllers have a natural gas bleed rate of zero at all sites, even though without power. The EPA has considered new information since 2016 and has now concluded that use of zero-emission controllers is technically feasible subject to a particular proposed exception discussed below. The EPA specifically requests comments on this conclusion. The EPA further solicits comment on market availability of zero-emission options.

Secondary impacts from the use of electronic controllers and instrument air systems are

[257] Pneumatic Controller Task Force Report to the Air Quality Control Commission. Pneumatic Controller Field Study and Recommendations. Colorado Department of Public Health and Environment. Air Pollution Control Division. June 1, 2020.

indirect, variable, and dependent on the electrical supply used to power the compressor or controllers. These impacts are expected to be minimal. For example, it is estimated that the electricity needed to operate a compressor is only around 0.4 kW/hour/controller when the compressor is operating. No other secondary impacts are expected. The EPA solicits comment on whether owners and operators would use diesel generators to generate power to run zero-emissions controllers. The EPA recognizes that diesel generators would generate formaldehyde emissions and there could be associated secondary impacts. The EPA does not intend for diesel generators to be used.

In light of the above, we find that the BSER for reducing methane and VOC emissions from natural gas-driven pneumatic controllers at production and transmission and storage sites is the use of zero-emissions controllers. Therefore, for NSPS OOOOb, we are proposing to require zero emissions of methane and VOC to the atmosphere for all pneumatic controllers at production and transmission and storage sites.

Both NSPS OOOO and NSPS OOOOa allow the use of high-bleed pneumatic controllers at production sites and natural gas-driven continuous bleed controllers at natural gas processing plants if it is determined that the use of such a pneumatic controller affected facility with a bleed rate greater than the applicable standard is required "based on functional needs, including but not limited to response time, safety and positive actuation." See 40 CFR 60.5390(a) and 60.5390a(a). This exemption was based on comments received on the 2011 proposed NSPS OOOO rule. There, "[t]he commenters suggest exemptions that address situations such as those where the natural gas includes impurities that could increase the likelihood of fouling a low-bleed pneumatic controller, such as paraffin or salts; where weather conditions could degrade

pneumatic controller performance; during emergency conditions; where flow is not sufficient for low-bleed pneumatic controllers; where electricity is not available; and where engineering judgment recommends their use to maintain safety, reliability or efficiency." (77 FR 49520, August 16, 2012). These reasons to allow for an exemption based on functional need were based on the inability of a low-bleed controller to meet the functional requirements of an owner/operator such that a high-bleed controller would be required in certain instances. Since we are now proposing that nearly all pneumatic controllers have a methane and VOC emission rate of zero, subject to exemption explained below, we do not believe that the reasons cited above are still applicable. Therefore, the proposed rule does not include an exemption based on functional need. The EPA is requesting comment regarding the possibility of situations where functional requirements/needs dictate that a natural gas-driven controller that emits any amount of VOC and/or methane be used. For example, are there situations where a zero-emission controller cannot be used due to functional needs such that an owner/operator must use a low-bleed controller or an intermittent controller instead? Comments requesting such an exemption should include details of the specific functional need and why all zero-emission controller options are not suitable.

For many sites, the EPA believes that the most feasible zero-emission option will be solar-powered controllers. The EPA recognizes that solar-powered controllers are dependent on sunshine, and in areas at higher latitudes that undergo prolonged periods without sunshine, this option could be problematic to implement due to the technical limitations of solar panels coupled with the practical realities related to the hours of sunshine received. Therefore, the proposed rule includes an exemption from the zero-emission requirement for pneumatic controllers at sites in

Alaska that do not have access to power (*i.e.*, electricity from the grid or produced using natural gas on-site). Sites with power have clearly demonstrated that zero emissions from controllers is achievable, and therefore the EPA is not proposing to exempt pneumatic controllers at sites in Alaska that have power. The proposed exemption would only apply to pneumatic controllers at sites located in Alaska that do not have access to power. In those situations, affected facilities would not be required to comply with the zero-emission standard, but instead must use low-bleed pneumatic controllers (unless a high bleed device is needed for functional reasons) and must monitor any intermittent controllers in conjunction with the fugitives monitoring program to ensure they are not venting when idle. The EPA is soliciting comment on this proposed exemption. Specifically, the EPA is interested in comments regarding the technical feasibility of solar panels to power pneumatic controllers in Alaska. The EPA is also interested in comments regarding whether there are other locations outside of Alaska where such an exemption may be warranted. In submitting responses to this request, commenters should be mindful that two Canadian Provinces, which are north of any U.S. State other than Alaska, require zero-emitting controllers at all new sites.

Natural Gas Processing Plants.

Natural gas processing plants typically have higher numbers of pneumatic controllers than production and transmission and storage sites. Model plants were also used for this analysis, specifically the model plants used are the same as those used for the 2011 and 2015 BSER analyses, and include small, medium, and large sites. The number of controllers is 15, 63, and 175 for small, medium, and large model plants, respectively. All controllers at these sites are assumed to be continuous, but the number of low bleed and high bleed devices is not specified

for the model plants. It was assumed that each controller emitted 1 tpy methane, as derived from Volume 12 of a 1996 GRI report.[258] In addition, it was assumed that the portion of natural gas that is methane is 82.8 percent in the natural gas processing segment, and the specific VOC to methane ratio assumed was 0.278 pounds VOC per pound methane. For detailed information on the configuration of these model plants, see the NSPS OOOOb and EG TSD, which is available in the docket.

For natural gas processing plants, the only option evaluated was the requirement to use zero-emission controllers. For our analysis, we examined the use of instrument air, which is the most commonly used controller technology at natural gas processing plants. For this analysis, we used cost data from the 2011 NSPS OOOO TSD updated to 2019 dollars. The updated capital costs for an instrument air system at a natural gas processing plant ranges from $20,000 to $162,000, depending on the system size. The annualized costs were based on a 7 percent interest rate and a 10-year equipment life. This equated to an annualized cost of approximately $13,000 to $96,000 per system. The emissions reduction associated with the installation of an instrument air system over natural gas-driven pneumatic controllers ranged from approximately 15 to 175 tpy methane and 4.2 to 49 tpy VOC per system. The cost effectiveness is estimated to range from approximately $550 to $900 per ton methane eliminated $2,000 to $3,100 per ton VOC eliminated. When considering the costs of saving the natural gas that would otherwise be emitted, the cost effectiveness improves, with a cost effectiveness of $370 to $700 per ton of methane eliminated and $1,300 to $2,500 per ton of VOC eliminated. These cost effectiveness

[258] Radian International LLC. *Methane Emissions from the Natural Gas Industry*, Vol. 12: Pneumatic Devices. Prepared for the Gas Research Institute and Environmental Protection Agency. EPA-600/R-96-080k. June 1996.

values are presented on a single pollutant basis, and the cost of control on a multipollutant basis is 50 percent of these values. These values are well within the range of what the EPA considers to be reasonable for methane and VOC using both the single pollutant and multipollutant approaches.

The 2012 NSPS OOOO and 2016 NSPS OOOOa require a zero-bleed emission rate for pneumatic controllers at natural gas processing plants. Natural gas processing plants have successfully met this standard for many years now. Further, several State agencies have rules that include this zero-bleed requirement for controllers at natural gas processing plants. This is further demonstration of the reasonableness of a zero methane and VOC emission standard for pneumatic controllers at natural gas processing plants.

We find the cost effectiveness of eliminating methane and VOC emissions using both the single pollutant and multipollutant approaches to be reasonable.

Secondary impacts from the use of instrument air systems are indirect, variable, and dependent on the electrical supply used to power the compressor. These impacts are expected to be minimal, and no other secondary impacts are expected.

In light of the above, we find that the BSER for reducing methane and VOC emissions from natural gas-driven pneumatic controllers at natural gas processing plants is the use of zero-emissions controllers. Therefore, for NSPS OOOOb, we are proposing to require a natural gas emission rate of zero for all pneumatic controllers at natural gas processing plants. However, we recognize that there may be technical limitations in some situations where zero-emissions controllers may not be feasible, and therefore, we are proposing an allowance for the use of natural gas-driven pneumatic controllers with an emission rate of methane and VOC greater than

zero where needed due to functional requirements in this BSER determination. Justification of this functional need must be provided in an annual report and maintained in records.

f. Use of Combustion Devices and VRUs

Another option that could potentially be used to reduce emissions from pneumatic controllers is to collect the emissions from natural gas driven continuous bleed controllers and intermittent vent controllers and route the emissions through a closed vent system to a control device or process. This option is allowed in some State rules. While the EPA did not evaluate the cost effectiveness of this option due to a lack of available information regarding control system costs and feasibility across sites, we think this option could be cost effective for owners and operations in certain situations, particularly if the site already has a control device to which the emissions from controllers could be routed. As this option could be used to achieve significant methane and VOC emission reductions (95 percent or greater), we are soliciting comment on whether this is a control technique used in the industry to reduce emissions from natural gas-driven pneumatic controllers. We are also interested in information related to the performance testing, monitoring, and compliance requirements associated with these control devices. Finally, we are interested in ideas as to how this option could potentially fit with the proposed requirements for pneumatic controllers. For example, if an owner or operator determines that a natural gas-driven pneumatic controller is required for functional need reasons, the EPA could require that emissions be collected and routed to a control device that achieves 95, or 98, percent control.

2. EG OOOOc

The EPA evaluated BSER for the control of methane from existing pneumatic controllers

(designated facilities) in all segments in the Crude Oil and Natural Gas source category covered by the proposed NSPS OOOOb and translated the degree of emission limitation achievable through application of the BSER into a proposed presumptive standard for these facilities that essentially mirrors the proposed NSPS OOOOb.

First, based on the same criteria and reasoning as explained above, the EPA is proposing to define the designated facilities in the context of existing pneumatic controllers as those that commenced construction on or before **[INSERT DATE OF PUBLICATION IN FEDERAL REGISTER].** Based on information available to the EPA, we did not identify any factors specific to existing sources that would indicate that the EPA should change these definitions as applied to existing sources. As such, for purposes of the emission guidelines, the definition of a designated facility in terms of pneumatic controllers is each individual natural gas driven pneumatic controller (continuous bleed or intermittent vent) that vents to the atmosphere.

Next, the EPA finds that the control options evaluated for new sources for NSPS OOOOb are appropriate for consideration in the context of existing sources under the EG OOOOc. The EPA finds no reason to evaluate different, or additional, control measures in the context of existing sources because the EPA is unaware of any control measures, or systems of emission reduction, for pneumatic controllers that could be used for existing sources but not for new sources.

Next, the methane emission reductions expected to be achieved via application of the control measures identified above for new sources are also expected to be achieved by application of the same control measures to existing sources. The EPA finds no reason to believe that these calculations would differ for existing sources as compared to new sources because the

EPA believes that the baseline emissions of an uncontrolled source are the same, or very similar, and the efficiency of the control measures are the same, or very similar, compared to the analysis above. This is also true with respect to the costs, non-air environmental impacts, energy impacts, and technical limitations discussed above for the control options identified.

For the most part, the information presented above regarding the costs related to new sources and the NSPS are also applicable for existing sources. The instance where the EPA estimated a difference in the costs between a new and existing source was for the retrofit of an existing production site to use instrument air at sites equipped with electrical power. While the equipment needed is the same as for new sites, it may be more difficult to design and install a retrofitted system. Therefore, the EPA estimates the costs for design and installation to be twice that of the costs for new systems (from approximately $32,000 for new systems to approximately $64,000 for existing systems), resulting in the capital cost of the system being approximately $127,000 with an annualized cost of approximately $14,000.

As noted above, the EPA's analysis for this proposal only examined the cost of instrument air for the large model plant. The total elimination of methane emissions (25 tons per year methane for production sites and 10 tons per year methane for transmission and storage sites) would be the same for existing sources as presented above for new sources. Considering the cost difference, the cost effectiveness for production sites is $560 per ton of methane eliminated without considering savings, and $365 per ton when considering savings. For the transmission and storage segment, the cost effectiveness is $1,400 per ton of methane eliminated. These values are within the range of what the EPA considers to be reasonable for methane. Since none of the other factors are different for existing sources when compared to the information

discussed above for new sources, the EPA concludes that BSER for existing sources and the proposed presumptive standard for EG OOOOc to be the requirement to use zero-emission controllers. This proposed EG includes the exemption from the zero-emission standard for pneumatic controllers in Alaska as explained above in the context of the proposed NSPS OOOOb.

b. Possible Phase-In Approach for Existing Sources.

The EPA recognizes there could be different compliance time approaches that could be implemented for existing pneumatic controllers. The EPA's proposal for compliance times State plans must include to meet the requirements of the EG can be found in Section XIV.E. As explained there, the EPA is proposing that State plans must generally include a 2-year timeline for compliance in the proposed EG, but is also soliciting comment on the possibility of the EG requiring different compliance timelines for different emission points. Specifically, in the context of pneumatic controllers, the EPA is further soliciting comment on including a phase-in approach in the EG. The EPA recognizes that a phase-in approach may only be appropriate for existing sources as new facilities could presumably plan for zero-emission controllers during construction. A phase-in period could span a number of years (*e.g.*, 2 years), to allow owners and operators to prioritize conversion of natural gas-driven controllers at existing sites based on specific factors (*e.g.*, focus first on sites with onsite power, sites with highest production, sites with the highest number of controllers). A phase-in approach could also result in the conversion of a certain percentage of sites within a given area (*e.g.*, State or basin). For example, the State of Colorado requires a minimum of 40 percent of sites to be converted after 2 years, with 15 percent in year 1 and 25 percent in year 2. The EPA also recognizes potential challenges with a phase-in

approach, such as difficulties with enforcement and calculation of the percentage converted due to the frequency at which sites may change ownership. The EPA solicits comment on all aspects of the EG requiring State plans to include a phase-in approach, and whether the agency should consider this type of approach rather than a single compliance time. The EPA also solicits comment on cost and feasibility factors that would enter into adopting and designing a phase-in timeline.

c. Natural Gas Processing Plants.

The information presented above regarding the emissions, emission reduction options and their effectiveness, costs, and other factors related to new natural gas processing plants and the NSPS are also applicable for existing sources. Therefore, the EPA concludes that BSER for existing sources and the EG OOOOc for natural gas processing plants is the requirement to use zero-emission controllers.

D. Proposed Standards for Well Liquids Unloading Operations

1. NSPS OOOOb

a. Background

In the 2015 NSPS OOOOa proposal (80 FR 56614-56615, September 18, 2015), the EPA stated that based on available information and input received from stakeholders on the 2014 *Oil and Natural Gas Sector Liquids Unloading Processes* review document,[259] sufficient information was not available to propose a standard for liquids unloading.

At that time, the EPA requested comment on technologies and techniques that could be

[259] U.S. Environmental Protection Agency. *Oil and Natural Gas Sector Liquids Unloading Processes*. Report for Oil and Natural Gas Sector. Liquids Unloading Processes Review Panel. April 2014.

applied to new gas wells to reduce emissions from liquids unloading events in the future. In the 2016 NSPS OOOOa final rule (81 FR 35846, June 3, 2016), the EPA stated that, although the EPA received valuable information from the public comment process, the information was not sufficient to finalize a national standard representing BSER for liquids unloading at that time.

For this proposal, the EPA conducted a review of available information, including new information that became available after the 2016 NSPS OOOOa rulemaking. As a result of this review, the EPA is proposing a zero VOC and methane emission standard under NSPS OOOOb for liquid unloading, which can be achieved using non-venting liquids unloading methods. In the event that it is technically infeasible or not safe to perform liquids unloading with zero emissions, the EPA is proposing to require that an owner or operator establish and follow BMPs to minimize methane and VOC emissions during liquids unloading events to the extent possible. These proposed requirements apply to each well liquids unloading event.

An overall description of liquids unloading, the definition of a modification, the definition of affected facility, our BSER analysis, and the proposed format of the standard are presented below.

b. Description

In new gas wells, there is generally sufficient reservoir pressure/gas velocity to facilitate the flow of water and hydrocarbon liquids through the well head and to the separator to the surface along with produced gas. In mature gas wells, the accumulation of liquids in the wellbore can occur when the bottom well pressure/gas velocity approaches the average reservoir pressure (*i.e.*, volumetric average fluid pressure within the reservoir across the areal extent of the

reservoir boundaries).[260] This accumulation of liquids can impede and sometimes halt gas production. When the accumulation of liquids results in the slowing or cessation of gas production (*i.e.*, liquids loading), removal of fluids (*i.e.*, liquids unloading) is required in order to maintain production. These gas wells therefore often need to remove or "unload" the accumulated liquids so that gas production is not inhibited.

The 2019 U.S. GHGI estimates almost 175,800 metric tpy of methane emissions from liquids unloading events for natural gas systems. Specifically, this includes almost 175,800 metric tpy from natural gas production, 98,900 metric tpy of which is from liquids unloading events that use a plunger lift, and 76,900 metric tpy from liquids unloading events that do not use a plunger lift. The overall total represents 3 percent of the total methane emissions estimated from natural gas systems.

In addition to the GHGI information, we also examined the information submitted under GHGRP subpart W. Specifically, we examined the GHGRP subpart W liquids unloading emissions data reported for Reporting Years 2015 to 2019. The liquids unloading emissions reported under GHGRP subpart W include emissions from venting wells, including those wells that vent during events that use a plunger lift and wells that vent during events that do not use a plunger lift. The information reported shows that methane emissions from liquids unloading for a well range from 0 to over 1,000 metric tons (1,100 tons) per year. While the single well with liquids unloading emissions of 1,100 tpy appears to be an outlier, there were over 65 subbasins with reported average liquids unloading emissions of 50 tpy or greater per well when

[260] Gordon Smith Review. *Oil & Natural Gas Sector Liquids Unloading Processes*. Submitted: June 16, 2014. Pg. 4.

disaggregating data by year and calculation method. There were over 1,000 wells reporting in these subbasins. In addition, there were almost 300 sub-basins with reported average liquids unloading methane emissions of 10 tpy or greater per well. There were almost 8,000 wells reporting in these subbasins.

Another source of information reviewed related to emissions information from liquids unloading was a study published in 2015 by Allen, et al (University of Texas (UT) Study).[261,262] The UT Study collected monitoring data across regions of the U.S. Among other findings in this report, for wells that vent more than 100 times per year, the average methane emissions per well per year were 27 metric tpy, with 95 percent confidence bounds of 10 to 50 Mg/yr (based on the confidence bounds in the emissions per event). The monitoring data shows that methane emissions from liquids unloading for a well range from 1 to 19,500 Mscf per year, or 0.02 to 406 tpy.[263] As indicated by the UT study[264] emissions information, a small fraction of wells account for a large fraction of liquids unloading emissions.

c. Modification

As noted in section XII.D.1.b, new wells typically do not require liquids unloading until the point that the accumulation of liquids impedes or even stops gas production. At that point, the

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[261] D. T. Allen, D. W. Sullivan, D. Zavala-Araiza, A. P. Pacsi, M. Harrison, K. Keen, M. P. Fraser, A. Daniel Hill, B. K. Lamb, R. F. Sawyer, J. H. Seinfeld, *Methane emissions from process equipment at natural gas production sites in the United States: Liquid unloadings*. Environ. Sci. Technol. 49, 641–648 (2015). doi:10.1021/es504016r Medline. (UT Study).
[262] D. T. Allen, D. W. Sullivan, D. Zavala-Araiza, A. P. Pacsi, M. Harrison, K. Keen, M. P. Fraser, A. Daniel Hill, B. K. Lamb, R. F. Sawyer, J. H. Seinfeld. *Methane Emissions from Process Equipment at Natural Gas Production Sites in the United States: Liquid Unloadings - Supporting Information*; (UT Study – SI). Table S5-1, pg. 21.
[263] UT Study – SI. Tables S3-1 to S3-3, pgs. 11-14.
[264] UT Study. pg. 642.

well must be unloaded of liquids to improve the gas flow. One method to accomplish this involves the intentional manual venting of the well to the atmosphere to improve gas flow. This is done using various techniques. One common manual unloading technique diverts the well's flow, bypassing the production separator to a lower pressure source, such as an atmospheric pressure tank. Under this scenario, venting to the atmospheric tank occurs because the separator operates at a higher pressure than the atmospheric tank and the well will temporarily flow to the atmospheric tank (which has a lower pressure than the pressurized separator). Natural gas is released through the tank vent to the atmosphere until liquids are unloaded and the flow diverted back to the separator. As discussed later in this section, the EPA has received feedback that there are technical difficulties with flaring vented emissions as a result of the intermittent and surging flow characteristic of venting for liquids unloading, and the changing velocities during an unloading event.

Since each unloading event constitutes a physical or operational change to the well that has the potential to increase emissions, the EPA is proposing to determine each event of liquids unloading constitutes a modification that makes a well an affected facility subject to the NSPS. See 40 CFR 60.14(a) ("any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies shall be considered a modification within the meaning of section 111 of the Act"). The EPA solicits comment on this determination.

d. Definition of Affected Facility

Given that we have proposed to determine that every liquids unloading event is a modification, the next step is to define the affected facility. The EPA recognizes that methods are

commonly employed that significantly reduce, or even eliminate, emissions from liquids unloading. Therefore, the EPA is co-proposing two options on how a modified well due to a liquids unloading event would be covered under the rule.

Under the first option, the affected facility subject to the requirements of NSPS OOOOb would be defined as every well that undergoes liquids unloading after the effective date of the final rule. Under this scenario, a well that undergoes liquids unloading is an affected facility regardless of whether the liquids unloading approach used results in venting to the atmosphere. This option posits that techniques employed to unload liquids that do not increase emissions are not to be considered in whether the unloading event is an affected facility or not, since the liquids unloading event in their absence could result in an emissions increase. This is somewhat analogous to a physical change to an existing storage vessel that resulted in the ability to increase throughput, and thus emissions. This physical change could result in an increase in emissions even if emissions were captured and routed back to a process such that the level of pollutant actually emitted to the atmosphere did not change. Under this scenario, the EPA could request and obtain compliance and enforcement information on non-venting liquids unloading event methods commonly employed (simple records and reporting requirements), as well as venting liquids unloading events.

Under the second option, the affected facility would be defined as every well that undergoes liquids unloading using a method that is not designed to totally eliminate venting (i.e., that results in emissions to the atmosphere). Under this scenario, if an owner or operator employs a method to unload liquids that does not vent to the atmosphere, the liquids unloading event would not constitute an increase in emissions and therefore, the well would not be an affected

facility. As such, the first liquids unloading event that vents to the atmosphere after the effective date of the final rule, would be an affected facility subject to the requirements of NSPS OOOOb. This option could create an enforcement information and compliance gap. Specifically, the EPA would not be able to obtain compliance assurance information on liquids unloading events and emissions/methods and there could be a decreased incentive for owners or operators to ensure that no unexpected emission episodes occur when a method designed to be non-venting is used.

The EPA solicits comments on the two affected facility definition options being co-proposed. Specifically, we request comment on whether there are implementation and/or compliance assurance concerns that arise with applying either of the co-proposed options. In addition, we request comment on if there are any appropriate exemptions for operations that may be unlikely to result in emissions, such as wellheads that are not operating under positive pressure.

e. 2021 BSER Analysis

The choice of what liquids unloading technique to employ is based on an operator well-by-well and reservoir-by-reservoir engineering analysis. Because liquids unloading operations entail a number of complex science and engineering considerations that can vary across well sites, there is no single technological solution or technique that is optimal for liquids unloading at all wells. Rather, a large number of differing technologies, techniques and practices (*i.e.*, "methods") have been developed to address the unique characteristics of individual wells so as to manage liquids and maintain production. These methods include, but are not limited to, manual unloading, velocity tubing or velocity strings, beam or rod pumps, electric submergence pumps, intermittent unloading, gas lift (*e.g.*, use of a plunger lift), foam agents, wellhead compression,

and routing the gas to a sales line or back to a process.

Selecting a particular method to meet a particular well's unloading needs must be based on a production engineering decision that is designed to remove the barriers to production. The situation is further complicated as the best method for a particular well can change over time. At the onset of liquids loading, techniques that rely on the reservoir energy are typically used. Eventually a well's reservoir energy is not sufficient to remove the liquids from the well and it is necessary to add energy to the well to continue production.

In the 2016 NSPS OOOOa final rule preamble, the EPA acknowledged that operators must select the technique to perform liquids unloading operations based on the conditions of the well each time production is impaired. During the development of the 2016 NSPS OOOOa rule, the EPA considered subcategorization based on the potential for well site liquids unloading emissions but determined that the differences in liquids unloading events (with respect to both frequency and emissions level) are due to specific conditions of a given well at the time the operator determines that well production is impaired such that unloading must be done. Since owners and operators must select the technique to perform an unloading operation based on those conditions, and because well conditions change over time, each iteration of unloading may require repeating a single technique or attempting a different technique that may not have been appropriate under prior conditions. As noted above, we recognized that the choice of method to unload liquids from a well needs to be a production engineering decision based on the characteristics of the well at the time of the unloading, and owners and operators need the flexibility to select a method that is effective and can be safely employed. No information has become available since 2016 that leads the EPA to reach a different conclusion regarding

subcategorization of wells for the purpose of developing standards to address liquids unloading emissions. Further, the EPA acknowledges the need for owners and operators to have the flexibility to select the most appropriate method(s) and recognize that any standard must not impede this flexibility.

Many methods used for liquids unloading do not result in any venting to the atmosphere, provided that the method is properly executed. High-level summaries of a few of these methods are provided below.[265]

A commonly used method employed in the field is the use of a plunger lift system. While plunger lift systems often are used in a way to minimize emissions, under certain conditions they can be operated to unload liquids in a manner that eliminates the need to vent to the atmosphere. Plunger lifts use the well's own energy (gas/pressure) to drive a piston or plunger that travels the length of the tubing in order to push accumulated liquids in the tubing to the surface. Specific criteria regarding well pressure and liquid to gas ratio can affect applicability. Candidate wells for plunger lift systems generally do not have adequate downhole pressure for the well to flow freely into a gas gathering system. Optimized plunger lift systems (e.g., with smart well automation) can decrease the amount of gas vented by up to and greater than 90 percent, and in some instances can reduce the need for venting due to overloading. Plunger lift costs range from $1,900 to $20,000.[266] Adding smart automation can cost anywhere between an estimated $4,700

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[265] "*Oil and Natural Gas Sector Liquids Unloading Processes*". Report for Oil and Natural Gas Sector
Liquids Unloading Processes Review Panel. Prepared by U.S. EPA OAQPS. April 2014.
[265] 80 FR 56593, September 18, 2015.
[266] U.S. Environmental Protection Agency. *Installing Plunger Lift Systems in Gas Wells*. Office of Air and Radiation: Natural Gas Star Program. Washington, DC. 2006.

to $18,000 depending on the complexity of the well. Natural Gas STAR estimates that the annual cost savings from avoided emissions from the use of an automated system ranges anywhere between $2,400 and $10,241 per year.[267]

Other artificial lifts (e.g., rod pumps, beam lift pumps, pumpjacks and downhole separator pumps) are typically used when there is inadequate pressure to use a plunger lift, and the only means of liquids unloading to keep gas flowing is downhole pump technology. Artificial lifts can be operated in a manner that produces no emissions. The use of an artificial lift requires access to a power source. The capital and installation costs (including location preparation, well clean out, artificial lift equipment and pumping unit) is estimated to be $41,000 to $62,000/well, with the average cost of a pumping unit being between $17,000 to $27,000. [268]

Velocity tubing is smaller diameter production tubing that reduces the cross-sectional area of flow, increasing the flow velocity and achieving liquids removal without blowing emissions to the atmosphere. Generally, a gas flow velocity of 1,000 feet per minute (fpm) is necessary to remove wellbore liquids. Velocity tubing strings are appropriate for low volume natural gas wells upon initial completion or near the end of their productive lives with relatively small liquids production and higher reservoir pressure. Candidate wells include marginal gas wells producing less than 60 Mcfd. Similarly, coil tubing can also be used in wells with lower velocity gas production (*i.e.*, seamed coiled tubing may provide better lift due to elimination of turbulence in the flow stream). The proper use of velocity tubing is considered to be a "no

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[267] U.S. Environmental Protection Agency. (U.S. EPA) 2011. *Options for Removing Accumulated Fluid and Improving Flow in Gas Wells*. Office of Air and Radiation: Natural Gas Star Program. Washington, DC. 2011. pg. 1.
[268] U.S. EPA, 2011. pg. 9.

emissions" solution. It is also low maintenance and effective for low volumes lifted. Velocity lifting can be deployed in combination with foaming agents (discussed below). The capital and installation costs are estimated to range anywhere from $7,000 to $64,000 per well.[269] Installation requires a well workover rig to remove existing production tubing and placement of the smaller diameter tubing string in the well.

The use of foaming agents (soap, surfactants) as a method to unload liquids is implemented by the injection of foaming agents in the casing/tubing annulus by a chemical pump on a timer basis. The gas bubbling of the soap-water solution creates gas-water foam which is more easily lifted to the surface for water removal. This, like the use of artificial lifts, requires power to run the surface injection pump. Additionally, foaming agents work best if the fluid in the well is at least 50 percent water and are not effective for natural gas liquids or liquid hydrocarbons. This method requires that the soap supply be monitored. If the well is still unable to unload fluid, smaller tubing may be needed to help lift the fluids. Foaming agents and velocity tubing are reported as possibly being more effective when used in combination. No equipment is required in shallow wells. In deep wells, a surfactant injection system requires the installation of surface equipment and regular monitoring. Foaming agents are reported as being low cost "no emissions" solution. The capital and startup costs to install soap launchers and velocity tubing is estimated to range between $7,500 and $67,880, with the monthly cost of the foaming agent is approximately $500 per well or approximately $6,000 per year.[270]

These are just a few examples of demonstrated methods that are being used in the

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[269] U.S. EPA, 2011. pg. 8.
[270] U.S. EPA. 2011. Pg. 8.

industry to unload accumulated liquids that impair production, that can be implemented without venting and, thus, without emissions. As stressed earlier, the selection of a specific method must be made based on well-specific characteristics and conditions.

Since GHGRP subpart W only requires reporting of liquids unloading events that resulted in venting of methane, no information is submitted regarding those wells that utilize a non-venting method. The EPA is also not aware of information that specifies the total number of wells that need to undergo liquids unloading. A 2012 report sponsored by the API and American Natural Gas Alliance (ANGA)[271] provided more definitive insight into the number of wells that use non-venting liquids unloading methods. This report indicated that an estimated 21.1 percent of plunger equipped wells vent, and 9.3 percent of non-plunger equipped wells vent. The EPA interprets this to mean that almost 80 percent of plunger-equipped wells, and over 90 percent of non-plunger-equipped wells perform liquids unloading and utilize non-venting methods.

As noted above, there is a tremendous range in the emissions from liquids unloading reported for individual wells. Further, as discussed above, the costs for the non-venting methods range considerably. Also, as discussed above, we have determined that the myriad of possible reservoir conditions and unloading methods do not lend to any reasonable subcategorization of the industry for which representative wells could be designed. Therefore, it is not possible to develop a "model" well, or even a series of model wells, that can be used to conduct the type of analysis frequently performed for BSER determinations that calculates a cost per ton of

[271] Shires, T. URS Corporation and Lev-On, M. the LEVON Group. *Characterizing Pivotal Sources of Methane Emissions from Natural Gas Production*. Summary and Analysis of API and ANGA Survey Responses. Prepared for the American Petroleum Institute and the American Natural Gas Alliance. September 21, 2012.

emissions reduced (or in this case eliminated).

Based on the highest costs included in the cost examples provided above, the cost effectiveness of a non-venting method would be considered reasonable for wells with annual methane emissions from liquids unloading of 16 tpy or greater, or VOC emissions of 3 tpy or greater. This upper range is based on the cost of the combination of velocity tubing and soap launchers. The upper range of the capital cost cited above was $67,800. Annualizing this capital cost at a 7 percent interest rate over 10 years, and adding in the $6,000 per year foaming agent cost, results in a total annual cost of $15,600. Given the total elimination of emissions, the cost effectiveness for a well with 16 tpy methane emissions would be $980 per ton of methane reduced, which is a level that the EPA considers reasonable for methane. Similarly, for VOC, the cost effectiveness for a well with 3 tpy VOC emissions would be $5,200 per ton of VOC reduced. This is also a level that the EPA considers reasonable. Given the range of costs, it could be reasonable even for some wells with annual liquids unloading methane emissions as low as 2.5 tpy ($400 per ton of methane reduced (velocity tubing)), or VOC emissions as low as 0.2 tpy ($5,000 per ton of VOC reduced (velocity tubing)). Based on the GHGRP subpart W data for the years 2015 through 2019, around 50 percent of the wells that performed liquids unloading and reported emissions reported emissions higher than these levels.

While owners and operators must select a liquids unloading method that is applicable for the well-specific conditions, they have the choice of many methods that can be used to eliminate venting/emissions from liquids unloading events. While we do not have information to calculate the specific percentage of total wells undergoing liquids unloading that use non-venting methods, available information suggests that a majority of wells that undergo liquids unloading do not

vent. The EPA solicits information on the number (or percent) of liquids unloading events that vent to the atmosphere versus do not vent to the atmosphere under normal conditions and whether there are technical obstacles (other than costs) that would not allow liquids unloading to be performed without venting.

CAA section 111(a) requires that the standard reflect the BSER that the EPA determines "has been adequately demonstrated." An "adequately demonstrated system" is one that "has been shown to be reasonably reliable, reasonably efficient, and which can reasonably be expected to serve the interests of pollution control without becoming exorbitantly costly in an economic or environmental way." *Essex Chem.*, 486 F.2d at 433. For the reasons explained above and further elaborated below, the EPA considers non-venting methods such as those described above to have been adequately demonstrated as the BSER for liquids unloading events. The complete elimination of emissions from liquids unloading with these non-venting methods have been adequately demonstrated in practice. The EPA notes that as part of decisions regarding liquids unloading, one goal of owners and operators is to eliminate venting to prevent the loss of product (natural gas) that could be routed to the sales line. States currently encourage the use of methods to eliminate emissions unless venting of emissions is necessary for safety reasons or when it is technically infeasible to not vent to unload liquids from the wellbore. For example, Pennsylvania has a general plan approval and/or general operating permit application (BAQ-GPA/GP-5A) that specifies that an owner or operator that conducts wellbore liquids unloading operations shall use best management practices including, but not limited to, plunger lift systems, soaping, swabbing, unless venting is necessary for safety to mitigate emissions during liquids unloading activities (Best Available Technology (BAT) Compliance Requirements under Section L of the General

Permit).

As discussed previously, a majority of wells already conduct liquids unloading operations without venting to the atmosphere. Also, as discussed previously, there are multiple non-venting liquids unloading methods that an owner and operator can select based on a well's specific characteristics and conditions. Our evaluation of costs shows that there are non-venting liquids unloading methods that could be employed to unload liquids that are reasonable given a wide range of emission levels. Finally, there are no negative secondary environmental impacts that would result from the implementation of methods that would eliminate venting of methane and VOC emissions to the atmosphere. In light of the above, the EPA considers non-venting liquids unloading methods to have been adequately demonstrated to represent BSER for reducing methane and VOC emissions during liquids unloading events.

An "adequately demonstrated" system needs not be one that can achieve the standard "at all times and under all circumstances." *Essex Chem.*, 486 F.2d at 433. That said, as discussed below, the EPA recognizes that there may be reasons that a non-venting method is infeasible for a particular well, and the proposed rule would allow for the use of BMPs to reduce the emissions to the maximum extent possible.

The EPA recognizes that there may be safety and technical reasons why venting to the atmosphere is necessary to unload liquids. In addition, it is possible that a well production engineer has already explored non-venting options and determined that there was no feasible option due to its specific characteristics and conditions. For scenarios where a liquids unloading method employed requires venting to the atmosphere, the EPA evaluated requiring BMPs that would minimize venting to the maximum extent possible. There are several States that require

the development and implementation of BMPs that minimize emissions from liquids unloading events that vent. For example, Colorado requires specified BMPs to eliminate or minimize vented emissions from liquids unloading. The rule requires that all attempts be made to unload liquids without venting unless venting is required for safety reasons. If venting is required, the rule requires that owners and operators be on site and that they ensure that any venting is limited to the maximum extent practicable. Specific BMPs evaluated are based on State rules that require BMPs to minimize emissions during liquids unloading events are to require operators to monitor manual liquids unloading events onsite and to follow procedures that minimize the need to vent emissions during an event. This includes following specific steps that create a differential pressure to minimize the need to vent a well to unload liquids and reducing wellbore pressure as much as possible prior to opening to atmosphere via storage tank, unloading through the separator where feasible, and requiring closure of all well head vents to the atmosphere and return of the well to production as soon as practicable. For example, where a plunger lift is used, the plunger lift can be operated so that the plunger returns to the top and the liquids and gas flow to the separator. Under this scenario, venting of the gas can be minimized and the gas that flows through the separator can be routed to sales. In situations where production engineers select an unloading technique that results or has the potential to vent emissions to the atmosphere, owners and operators already often implement BMPs in order to increase gas sales and reduce emissions and waste during these (often manual) liquids unloading activities. We performed a cost and impacts evaluation of the use of BMPs to reduce emissions from liquids unloading. This evaluation is provided in the NSPS OOOOb and EG TSD for this rulemaking.

Another potential method for reducing emissions from liquids unloading is to capture the

vented gas from an unloading event and route it to a control device. At the time the Crude Oil and Natural Gas Sector Liquids Unloading Processes draft review document was submitted to reviewers, the EPA noted that, although the EPA was not aware of any specific instances where combustion devices/flares were used to control emissions vented from unloading events, the EPA requested information on the technical feasibility of flaring as an emissions control option for liquids unloading events. Feedback received from reviewers indicated that there are technical reasons that flaring during liquids unloading is not a feasible option.[272] Reviewers emphasized that, in order to flare gas during liquids unloading, the liquids would need to be separated from the well stream, and the intermittent and surging flow characteristics of venting for liquids unloading, changing velocities during an unloading, and flare ignition considerations for a sporadically used flare (*i.e.*, would require either a continuous pilot or electronic igniter) would make use of a flare technically and financially infeasible.[273,274] The reviewers indicated that separating the liquids from the well stream would require the well stream to flow through a separator with sufficient backpressure to separate the gas and liquids. One reviewer noted that after separating the liquids from the well stream the gas would then be piped to flare system, where the backpressure needed to operate the separator would affect the performance of a plunger lift system (if used). Based on feedback received on the technical and cost feasibility of using a flare to control vented emissions from liquids unloading events indicating that a flare

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[272] U.S. Environmental Protection Agency. *Oil and Natural Gas Sector Liquids Unloading Processes*. Report for Crude Oil and Natural Gas Sector. Liquids Unloading Processes Review Panel. April 2014.
[273] Gordon Smith Review. *Oil and Natural Gas Sector Liquids Unloading Processes*. Review Submitted: June 16, 2014. Pg. 31.
[274] Jim Bolander, P.E., Senior Vice President, Southwestern Energy (SWN). Review Submitted: April 2014. Pg. 8.

cannot be used in all situations, we did not consider this option any further in this proposal. However, the EPA is soliciting comments about the use of control devices to reduce emissions from liquids unloading events. Specifically, we request information on the types of wells and unloading events for which routing to control is feasible and effective, the level of emission reduction achieved, and the testing and monitoring requirements that apply.

A similar potential method is to capture the vented gas from an unloading event and route it to the sales line or back to a process. This could potentially represent another method that results in zero emissions. While this is not a mitigation option that has been specifically mentioned for emissions from liquids unloading, it is a common option for other emission sources in the oil and natural gas production segment. The EPA is soliciting comments about the option to collect and route emissions back to the sales line or to a process. Specifically, we request information on the types of wells and unloading events for which this option is feasible (if any). If this option is feasible, we also request information on the specifics of the equipment and processes needed to accomplish this, as well as the costs.

In conclusion, the EPA evaluated several options and identified the use of non-venting methods as the BSER for reducing methane and VOC emissions during liquids unloading events. However, the EPA recognizes there could be situations where it is infeasible to utilize a non-venting method. Therefore, the EPA proposes to allow for the development and implementation of BMPs to reduce emissions to the extent possible during liquids unloading where it is infeasible to utilize a non-venting method.

f. Format of the Standard

As discussed under section XII.D.1.d of this preamble, the EPA is co-proposing two

regulatory approaches to implement the BSER determination.

For Option 1, the affected facility would be defined as every well that undergoes liquids unloading. This would mean that wells that utilize a non-venting method for liquids unloading would be affected facilities and subject to certain reporting and recordkeeping requirements. These requirements would include records of the number of unloadings that occur and the method used. A summary of this information would also be required to be reported in the annual report. The EPA also recognizes that under some circumstances venting could occur when a selected liquids unloading method that is designed to not vent to the atmosphere is not properly applied (*e.g.*, a technology malfunction or operator error). Under the proposed rule Option 1 owners and operators in this situation would be required to record and report these instances, as well as document and report the length of venting and what actions were taken to minimize venting to the maximum extent possible.

For wells that utilize methods that vent to the atmosphere, the proposed rule would require that they: (1) Document why it is infeasible to utilize a non-venting method due to technical, safety, or economic reasons; (2) develop BMPs that ensure that emissions during liquids unloading are minimized; (3) follow the BMPs during each liquids unloading event and maintain records demonstrating they were followed; (4) report the number of liquids unloading events in an annual report, as well as the unloading events when the BMP was not followed. While the proposed rule would not dictate the specific practices that must be included, it would specify minimum acceptance criteria required for the types and nature of the practices. Examples of the types and nature of the required practice elements for BMP are provided in section XII.D.1.e, such as those contained in Colorado's rule. The EPA is specifically requesting

comment on the minimum elements that should be required in BMPs and the specificity that the proposed rule should include regarding these elements.

An advantage of this regulatory option is that it would provide information to the EPA on the number of liquids unloading events that occur and the types of unloading methods used. Having this important information would enhance the EPA, the industry, and the public's knowledge of emissions from liquids unloading. Option 1 would also provide incentive for owners and operators to ensure that non-venting methods are applied as they are designed such that unexpected emissions do not occur as the result of technology malfunctions or operator error. However, it would result in some recordkeeping and reporting burden for wells that already use or plan to use non-venting methods that would not be incurred under Option 2.

For Option 2, the affected facility would be defined as every well that undergoes liquids unloading using a method that is not designed to eliminate venting. The significant difference in this option is that wells that utilize non-venting methods would not be affected facilities that are subject to the NSPS OOOOb. Therefore, they would not have requirements other than to maintain records to demonstrate that they used non-venting liquids unloading methods. The requirements for wells that use methods that vent would be the same as described above under Option 1.

The EPA believes that this option would provide additional incentive for owners and operators to seek ways to overcome potential infeasibility issues to ensure that their wells are not affected facilities and subject to reporting and recordkeeping requirements. This would ultimately result in lower emissions. However, this would not provide the EPA information to have a more comprehensive understanding of emissions and emission reduction methods from

liquids unloading. It would also not provide incentive for owners and operators to ensure that no unexpected emission episodes occur when a method designed to be non-venting is used.

2. EG OOOOc

As described above, the EPA is proposing that each unloading event represents a modification, which will make the well subject to new source standards under NSPS. Therefore, existing wells that undergo liquids unloading would become subject to NSPS OOOOb. This will mean that there will never be a well that undergoes liquids unloading that will be "existing" for purposes of CAA section 111(d). Therefore, there is no need for emissions guidelines or an associated presumptive standard under EG OOOOc for liquids unloading operations.

E. Proposed Standards for Reciprocating Compressors

1. NSPS OOOOb

a. Background

The 2012 NSPS OOOO and the 2016 NSPS OOOOa applied to each individual new or reconstructed reciprocating compressor, except for those compressors located at a well site, or those located at an adjacent well site and servicing more than one well site. The 2016 NSPS OOOOa required the reduction of methane and VOC emissions from new, reconstructed, or modified reciprocating compressors by replacing rod packing systems within 26,000 hours or 36 months of operation, regardless of the condition of the rod packing. As an alternative, the 2016 NSPS OOOOa allowed owners or operators to collect the emissions from the rod packing using a rod packing emissions collection system that operates under negative pressure and route the rod packing emissions to a process through a closed vent system.

In determining BSER for reciprocating compressors in 2016, the EPA determined that the

previous determination for NSPS OOOO conducted in 2011/2012 still represented BSER in 2016. In the 2012 determination the EPA first concluded that the piston rod packing wear produces fugitive emissions that cannot be captured and conveyed to a control device, and that an operational standard pursuant to section 111(h) of the CAA was appropriate. The EPA conducted analyses of the costs and emission reductions of the replacement of rod packing every 3 years or 26,000 hours of operation and determined that the costs per ton of emissions reduced were reasonable for the industry, with the exception of compressors at well sites. Based on the 2011 BSER analysis, requiring replacement of rod packing every 3 years or 26,000 hours of operation for well site reciprocating compressors was not considered cost effective (almost $57,000 per ton of VOC reduced).[275] No other more stringent control options were evaluated at that time.

For this review of the NSPS, the EPA focused on these control options which were previously assessed for the 2012 NSPS OOOO and the 2016 NSPS OOOOa. In addition, we evaluated an option that would require annual monitoring to determine if the rod packing needed to be replaced. This option is in contrast to the option where replacement is required on a fixed (*e.g.*, 3 year) schedule. For this review, BSER was evaluated for reciprocating compressors at gathering and boosting stations in the production segment (considered to be representative of emissions from reciprocating compressors at centralized production facilities), at natural gas processing plants, and at sites in the transmission and storage segment. In 2012 and in 2016, the EPA determined that the cost effectiveness of replacement of the rod packing based on the fixed 3-year (or 26,000 hours) schedule was unreasonable for reciprocating compressors located at the

[275] 2011 NSPS OOOO TSD. pg. 6-17.

well site (discussed below). No new information has become available to change this determination. Therefore, we did not include reciprocating compressors located at well sites in our evaluation of regulatory options.

However, as discussed in section XI.L (Centralized Production Facilities) of this preamble, the EPA believes the definition of "well site" in NSPS OOOOa may cause confusion regarding whether reciprocating compressors located at centralized production facilities are also exempt from the standards. The EPA is proposing a new definition for a "centralized production facility". The EPA is proposing to define centralized production facilities separately from well sites because the number and size of equipment, particularly reciprocating and centrifugal compressors, is larger than standalone well sites which would not be included in the proposed definition of "centralized production facilities". This proposal is necessary in the context of reciprocating compressors to distinguish between these compressors at centralized production facilities where the EPA has determined that the standard should apply, and compressors at standalone well sites where the EPA has determined that the standard should not apply. In our current analysis, described below, we consider the reciprocating compressor gathering and boosting segment emission factor as being representative of reciprocating compressor emissions located at centralized production facilities. As such, the EPA is proposing that reciprocating compressors located at centralized production facilities would be subject to the standards in NSPS OOOOb and the EG in OOOOc, but reciprocating compressors at well sites (standalone well sites) would not.

As a result of the EPA's review of NSPS OOOOa, we are proposing that BSER is to replace the rod packing when, based on annual flow rate measurements, there are indications that

the rod packing is beginning to wear to the point where there is an increased rate of natural gas escaping around the packing to unacceptable levels. We are proposing that if annual flow rate monitoring indicates a flow rate for any individual cylinder as exceeding 2 scfm, an owner or operator would be required to replace the rod packing.

b. Description

In a reciprocating compressor, natural gas enters the suction manifold, and then flows into a compression cylinder where it is compressed by a piston driven in a reciprocating motion by the crankshaft powered by an internal combustion engine. Emissions occur when natural gas leaks around the piston rod when pressurized natural gas is in the cylinder. The compressor rod packing system consists of a series of flexible rings that create a seal around the piston rod to prevent gas from escaping between the rod and the inboard cylinder head. However, over time, during operation of the compressor, the rings become worn and the packaging system needs to be replaced to prevent excessive leaking from the compression cylinder.

As discussed previously, emissions from a reciprocating compressor occur when, over time, during operation of the compressor, the rings that form a seal around the piston rod that prevents gas from escaping become worn. This results in increasing emissions from the compression cylinder. Based on the 2021 GHGI,[276] the methane emissions from reciprocating compressors in 2019 represented 14 percent of the total methane emissions from natural gas systems in the Crude Oil and Natural Gas Industry sector. For segments where the GHGI included a breakdown of methane emissions for reciprocating compressors, the reported

[276] U.S. Environmental Protection Agency. Inventory of U.S. Greenhouse Gas Emissions and Sinks (1990-2019). Published in 2021. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019

emissions were 309,500 metric tons for the gathering and boosting segment, 46,700 metric tons for the processing segment, 406,500 metric tons for the transmission segment, and 103,200 metric tons for the storage segment.

c. Affected Facility

For purposes of the NSPS, the reciprocating compressor affected facility is a single reciprocating compressor. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under the proposed rule for the NSPS OOOOb. As discussed above, the EPA is proposing that the affected facility includes reciprocating compressors located at centralized production facilities and the affected facility exception for "a well site, or an adjacent well site servicing more than one well site" applies to standalone well sites and not centralized production facilities.

d. 2021 BSER Analysis

The methodology used for estimating emissions from reciprocating compressor rod packing is consistent with the methodology developed for the 2012 NSPS OOOO BSER analysis and then also used to support the 2016 NSPS OOOOa BSER. This approach uses volumetric methane emission factors referenced in the EPA/GRI study[277] as the basis, multiplied by the density of methane. These factors were per cylinder, so they were multiplied by the average number of cylinders per reciprocating compressor at each oil and gas industry segment, the pressurized factor (percentage of hours per year the compressor was pressurized), and 8,760 hours (number of hours in a year). Once the methane emissions were calculated, VOC emissions

[277] EPA/GRI. (1996). *Methane Emissions from the Natural Gas Industry: Volume 8 – Equipment Leaks*.

were calculated by multiplying the methane by ratios developed based on representative gas composition. The specific ratios that were used for this analysis were 0.278 pounds VOC per pound of methane for the production and processing segments, and 0.0277 pounds VOC per pound of methane for the transmission and storage segment. The resulting baseline emissions from reciprocating compressors were 12.3 tpy methane (3.4 tpy VOC) from gathering and boosting stations, 23.3 tpy methane (6.5 tpy VOC) from natural gas processing plants, 27.1 tpy methane (0.75 tpy VOC) from transmission stations, and 28.2 tpy methane (0.78 tpy VOC) from storage facilities.

Reducing emissions that result from the leaking of natural gas past the piston rod packing can be accomplished through several approaches including: (1) Specifying a frequency for the replacement of the compressor rod packing, (2) monitoring the emissions from the compressor and replacing the rod packing when the results exceed a specified threshold, (3) specifying a frequency for the replacement of the piston rod, (4) requiring the use of specific rod packing materials, and/or (5) capturing the leaking gas and routing it either to a process or a control device.

There was either insufficient information to establish BSER or it was determined that the option cannot be applied in all situations for approach options (3) through (5). These are discussed briefly below.

Like the packing rings, piston rods on reciprocating compressors also deteriorate. Piston rods, however, wear more slowly than packing rings, having a life of about 10 years.[278] Rods

[278] U.S. Environmental Protection Agency. *Lessons Learned from Natural Gas STAR Partners. Reducing Methane Emissions from Compressor Rod Packing Systems*. Natural Gas STAR Program. 2006.

wear "out-of-round" or taper when poorly aligned, which affects the fit of packing rings against the shaft (and therefore the tightness of the seal) and the rate of ring wear. An out-of-round shaft not only seals poorly, allowing more leakage, but also causes uneven wear on the seals, thereby shortening the life of the piston rod and the packing seal. Replacing or upgrading the rod can reduce reciprocating compressor rod packing emissions. Also, upgrading piston rods by coating them with tungsten carbide or chrome reduces wear over the life of the rod. We assume that operators will choose, at their discretion, when to replace/realign or retrofit the rod as part of regular maintenance procedures and replace the rod when appropriate when the compressor is out of service for other maintenance such as rod packing replacement. Although replacing/realigning or retrofitting the rod has been identified as a potential methane and VOC emission reduction option for reciprocating compressors, there is insufficient information on its emission reduction potential and use throughout the industry. Therefore, we did not evaluate this option any further as BSER for this proposal.

Although specific analyses have not been conducted, there may be potential for reducing methane and VOC emissions by updating rod packing components made from newer materials, which can help improve the life and performance of the rod packing system. One option is to replace the bronze metallic rod packing rings with longer lasting carbon-impregnated Teflon rings. Compressor rods can also be coated with chrome or tungsten carbide to reduce wear and extend the life of the piston rod. Although changing the rod packing material has been identified as a potential methane and VOC emission reduction option for reciprocating compressors, there is insufficient information on its emission reduction potential and use throughout the industry. Therefore, we did not evaluate this option any further as BSER for this proposal.

The 2016 NSPS OOOOa includes the alternative to route the emissions from reciprocating compressors to a process. One estimate obtained by the EPA states that a gas recovery system can result in the elimination of over 99 percent of methane emissions that would otherwise occur from the venting of the emissions from the compressor rod packing. The emissions that would have been vented are combusted in the compressor engine to generate power. It was estimated that, if a facility is able to route rod packing vents to a VRU system, it is possible to recover approximately 95-100 percent of emissions. As a comparison, the EPA estimated that the 3-year/26,000-hour changeout results in between 55 and 80 percent emission reduction. Therefore, an option to achieve additional emission reductions could be to require routing the reciprocating compressor emissions to a process/through a closed vent system under negative pressure. Although this was a control option considered in the 2016 NSPS OOOOa (and included as an alternative), the EPA did not require routing to a process for all compressors because at that time there was insufficient information to require this as a control for all reciprocating compressors. The EPA received feedback that this option cannot be applied in every installation, and has not received any new information that indicates this has changed. Thus, this option was not considered further as a requirement but for this proposal, as with the 2016 NSPS OOOOa, it is considered to be an acceptable alternative to mitigate methane and VOC emissions where it is technically feasible to apply.

Similarly, another option evaluated as having the potential to achieve methane and VOC emission reductions was to require the collection of emissions in a closed vent system and routing them to a flare or other control device. If the gas is routed to a flare, approximately 95 percent of the methane and VOC would be reduced. The EPA has expressed historically and

maintains that combustion is not believed to be a technically feasible control option for reciprocating compressors because, as detailed in the 2011 NSPS OOOO TSD, routing of emissions to a control device can cause positive back pressure on the packing, which can cause safety issues due to gas backing up in the distance piece area and engine crankcase in some designs. The EPA has not identified any new information to indicate that this has changed. Therefore, this option was not considered further as BSER for this proposal.

The remaining two control option approaches that were evaluated further for this proposal include: (1) Specifying a frequency for the replacement of the compressor rod packing (equivalent to the frequency used in the 2016 NSPS OOOOa BSER control level), and (2) monitoring the emissions from the compressor and replacing the rod packing when the results exceed a specified threshold. Both of these approaches would reduce the escape of natural gas from the piston rod. No wastes would be created (other than the worn packing that is being replaced) and no wastewater would be generated.

As noted previously, periodically replacing the packing rings ensures the correct fit is maintained between packing rings and the rod, thereby limiting emissions occurring around the flexible rings that fit around the shaft by recreating a seal against leakage that may have been lost due to wear. The potential emission reductions for reciprocating compressors at gathering and boosting stations, processing plants, and transmission and storage facilities were calculated by comparing the average rod packing emissions with the average emissions from newly installed and worn-in rod packing. As noted above, because the EPA concluded that the cost effectiveness of this option was extremely unreasonable for reciprocating compressors at well sites in previous BSER analyses (see the 2011 NSPS OOOO TSD, section 2.2; 80 FR 56620, September 18,

2015), and since no new information was identified that would change this outcome as it relates to stand alone well sites, reductions and costs were not re-evaluated in this analysis for reciprocating compressors at production well sites.

The emissions after the replacement of the rod packing were calculated using the methodology used under previous NSPS actions (see NSPS OOOOb and EG TSD, section 7.1). The resulting emission reductions used for the analysis represented the emission reductions expected in the year the rod packing is replaced. It is expected that there would be an increase in the emissions (and decrease in the emission reductions) from a compressor where the rod packing was replaced the second and third years before the next replacement. As noted above, this assumed reduction was between 55 and 80 percent depending on the location of the compressor.

The costs of replacing rod packing were obtained from a Natural Gas STAR Lessons Learned document[279] and the dollars were converted to 2019 dollars. The estimated cost to replace the packing rings in 2019 dollars was estimated to be $1,920 per cylinder. It was assumed that rod packing replacement would occur during planned shutdowns and maintenance, and therefore no additional travel costs would be incurred for implementing a rod packing replacement program. Since the assumed number of cylinders differs for reciprocating compressors at different segments, this means the capital costs also vary. These estimated capital costs are $6,350 at gathering and boosting and transmission stations, $4,800 at processing plants, and $8,650 at storage stations.

[279] EPA (2006). *Lessons Learned: Reducing Methane Emissions from Compressor Rod Packing Systems.* Natural Gas STAR. Environmental Protection Agency.

The 26,000-hour replacement frequency used for the cost impacts in the 2011 NSPS OOOO TSD and 2016 NSPS OOOOa TSD was determined using a weighted average of the annual percentage of time that reciprocating compressors are pressurized. The weighted average percentage was calculated to be 98.9 percent. This percentage was multiplied by the total number of hours in 3 years to obtain a value of 26,000 hours. This calculates to an average of 3.8 years for gathering and boosting compressors, 3.3 years for processing compressors, 3.8 years for transmission compressors, and 4.4 years for storage compressors. The calculated years were assumed to be the equipment life of the compressor rod packing and were used to calculate the capital recovery factor for each of the segments. Assuming an interest rate of 7 percent, the capital recovery factors were calculated to be 0.3093, 0.3498, 0.3093, and 0.2695 for the gathering and boosting part of production, processing, transmission, and storage segments, respectively.

The capital costs were calculated using the average rod packing cost noted above and the average number of cylinders per compressor (which differs depending on sector segment). The annual capital costs were calculated using the capital costs and the capital recovery factors. The estimated annual costs ranged from $1,700 at processing plants to just over $2,300 at storage facilities. Note that these estimated costs represent the costs, and associated emission reductions, that would occur in the year when the rod packing was changed. There would be no costs for the other two years in the three-year cycle. The costs presented for gathering and boosting segment reciprocating compressors represent the estimated costs assumed for reciprocating compressors located at centralized production facilities.

There are monetary savings associated with the amount of natural gas saved with

reciprocating compressor rod packing replacement. Monetary savings associated with the amount of gas saved with reciprocating compressor rod packing replacement were estimated using a natural gas price of $3.13 per Mcf. Estimated savings were only applied for gathering and boosting stations and processing plants, as it is assumed the owners of the compressor station do not own the natural gas that is compressed at the station.

Using the single pollutant approach, where all the costs are assigned to the reduction of one pollutant, the cost effectiveness of replacement of the reciprocating rod packing within 26,000 hours or 36 months of operation, regardless of the condition of the rod packing, is approximately $290 per ton of methane reduced for gathering and boosting ($100 per ton if gas savings are considered), $90 per ton of methane reduced for the processing segment (net savings if gas savings are considered), $90 per ton of methane reduced for the transmission segment, and $110 per ton of methane reduced for the storage segment. Using the multipollutant approach, where half the cost of control is assigned to the methane reduction and half to the VOC reduction, the cost effectiveness of replacement of the reciprocating rod packing within 26,000 hours or 36 months of operation, regardless of the condition of the rod packing, is approximately $140 per ton of methane reduced for gathering and boosting ($50 per ton if gas savings are considered), $45 per ton of methane reduced for the processing segment (net savings if gas savings are considered), $45 per ton of methane reduced for the transmission segment, and $50 per ton of methane reduced for the storage segment.

Using the single pollutant approach, where all the costs are assigned to the reduction of one pollutant, the VOC cost effectiveness of replacement of the reciprocating rod packing within 26,000 hours or 36 months of operation, regardless of the condition of the rod packing, is

approximately $1,030 per ton of VOC reduced for gathering and boosting ($380 per ton if gas savings are considered), $330 per ton of VOC reduced for the processing segment (net savings if gas savings are considered), $3,260 per ton of VOC reduced for the transmission segment , and $3,860 per ton of VOC reduced for the storage segment. Using the multipollutant approach, where half the cost of control is assigned to the methane reduction and half to the VOC reduction, the cost effectiveness of replacement of the reciprocating rod packing within 26,000 hours or 36 months of operation, regardless of the condition of the rod packing, is approximately $520 per ton of VOC reduced for gathering and boosting ($190 per ton if gas savings are considered), $160 per ton of VOC reduced for the processing segment (net savings if gas savings are considered), $1,630 per ton of VOC reduced for the transmission segment, and $1,930 per ton of VOC reduced for the storage segment.

As an alternative to replacing the rod packing on a fixed schedule, another option is to replace the rod packing when, based on measurements, there are indications that the rod packing is beginning to wear to the point where there is an increased rate of natural gas escaping around the packing to unacceptable levels. This is an approach required by the California Greenhouse Gas Emission Regulation and in Canada. The California Greenhous Gas Emission Regulation requires that the rod packing/seal be tested during periodic inspections and, if the rod packing/seal leak concentration exceeds the specified threshold of 2 scfm/cylinder, repairs must be made within 30 days.[280] Similarly, certain Canadian jurisdictions require periodic monitoring measurements of rod packing vent volumes (typically annually) for existing reciprocating

[280] State of California Air Resources Board (CARB). "*Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities*." Oil and Gas Final Regulation Order (ca.gov).

compressors. Where specified vent volumes are exceeded, the rules require corrective action be taken to reduce the flow rate to below or equal to a specified limit, as demonstrated by a remeasurement. Vent volume thresholds specified that would result in the need for corrective action vary from 0.49 to 0.81 scfm/cylinder.[281]

This approach is similar to an approach identified in the Natural Gas STAR Program referred to as "Economic Packing and Piston Rod Replacement."[282] Under this approach, facilities use specific financial objectives and monitoring data to determine emission levels at which it is cost effective to replace rings and rods. Benefits of calculating and utilizing this "economic replacement threshold" include methane and VOC emission reductions and natural gas cost savings. Using this approach, one Natural Gas STAR partner reportedly achieved savings of over $233,000 annually at 2006 gas prices. An economic replacement threshold approach can also result in operational benefits, including a longer life for existing equipment, improvements in operating efficiencies, and long-term savings. The EPA is not proposing to establish a financial objective or economic replacement threshold in this proposal, but the costs and emission reductions of replacing rod packing based on monitoring from this program were considered in the analysis discussed below.

The elements of such a program include establishing a frequency of monitoring, identifying a threshold where action is required to reduce emissions, and specifying the action

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[281] Canadian Federal standards: *http://gazette.gc.ca/rp-pr/p2/2018/2018-04-26-x1/pdf/g2-152x1.pdf*; Discussion Draft Regulation 26.11.41 (maryland.gov); *MAP-Technical-Report-December-19-2019-FINAL.pdf* (nm.gov)

[282] U.S. Environmental Protection Agency. *Lessons Learned from Natural Gas STAR Partners. Reducing Methane Emissions from Compressor Rod Packing Systems*. Natural Gas STAR Program. 2006.

for reducing emissions. The option defined by the EPA and evaluated below is for annual monitoring and requiring the replacement of the rod packing if the measured flow rate for any individual cylinder exceeds 2 scfm. This threshold is consistent with California's regulation. However, this option differs from the California regulation in that it would require a complete replacement of the rod packing if this threshold is exceeded, where California allows repair sufficient to reduce the flow rate back below 2 scfm. The 2 scfm flow rate threshold was established based on manufacturer guidelines indicating that a flow rate of 2 scfm or greater was considered indicative of rod packing failure. [283]

We estimated the emission reductions from requiring annual flow rate monitoring and repair/replacement of packing when the measured flow rate exceeds 2 scfm total gas during pressurized operation. Based on California's background regulatory documentation, information provided to the State indicated that the average leak rate for those compressors emitting more than 2 scfm was about 3 scfm during pressurized operation, and less than 2 scfm during pressurized idle and unpressurized states. Therefore, we assumed that the leak rate for compressors emitting more than 2 scfm was about 3 scfm during pressurized operation. As indicated above for the fixed schedule rod packing replacement option, based on the 2011 NSPS OOOO TSD and 2016 NSPS OOOOa TSD, the average emissions from a newly installed rod packing are assumed to be 11.5 scfh per cylinder.[284] Using a ratio of 0.829 methane: total natural gas ratio, 3 scfm total gas is approximately 2.49 scfm (149.2 scfh) methane. This compressor

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[283] State of California. *Air Resources Board Public Hearing to Consider the Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities.* Staff Report: Initial Statement of Reasons. pgs. 96-97.
[284] 2011 TSD, pg. 6-13.

emission rate, which was used for all industry segments, was converted to an annual mass emission rate by applying segment-specific pressurized factors, then converted to a mass basis.

The estimated percent reduction in methane emissions that would be achievable from reducing 149.2 scfh methane/cylinder to 11.5 scfh methane/cylinder (average emissions from a newly installed rod packing/cylinder) is 92 percent. We applied this percent reduction in methane emissions and estimated reciprocating compressor methane and VOC emission reductions that would be achieved from repairing/replacing rod packing based on the annual flow rate monitoring option. The calculations assume that all cylinders are emitting at 3 scfm, and that the rod packings for all compressor cylinders are replaced. This represents the emission reductions expected for the year in which the rod packings are replaced. Emissions would be expected to increase (and emission reductions decrease) in subsequent years until the next time the annual measurements require that the rod packing be replaced.

The capital and annual costs of replacing the rod packings are the same as presented above for the fixed interval rod packing replacement option. In addition, this option would include the costs associated with the annual flow measurements. The estimated costs of this monitoring are based on the costs for annual flow rate monitoring under GHGRP subpart W for similar flow rate annual measurement requirements ($597). The capital costs associated with replacing compressor rod packing would only occur in the year when packing is required to be replaced. The monitoring costs would be incurred every year.

Additionally, the cost estimates assume that the packing of all compressor cylinders would need to be replaced (which is unlikely to be the case in many instances) and are therefore conservative estimates. Support information for the California rule cites data indicating that

approximately 14 percent of compressors measurements indicated a leak rate of over 2 scfm per cylinder. Based on an average of 3.45 cylinders/compressor, California assumed that the packing for 2 cylinders/compressor would need to be replaced to come into compliance with the 2 scfm standard (57.9 percent).[285]

Using the single pollutant approach, where all the costs are assigned to the reduction of one pollutant, the cost effectiveness of the annual monitoring option is approximately $230 per ton of methane reduced for gathering and boosting ($40 per ton if gas savings are considered), $110 per ton of methane reduced for the processing segment (net savings if gas savings are considered), $100 per ton of methane reduced for the transmission segment, and $110 per ton of methane reduced for the storage segment. Using the multipollutant approach, where half the cost of control is assigned to the methane reduction and half to the VOC reduction, the cost effectiveness of replacement of the reciprocating rod packing based on the annual monitoring approach is approximately $110 per ton of methane reduced for gathering and boosting ($20 per ton if gas savings are considered), $50 per ton of methane reduced for the processing segment (net savings if gas savings are considered), $50 per ton of methane reduced for the transmission segment, and $60 per ton of methane reduced for the storage segment.

Using the single pollutant approach, where all the costs are assigned to the reduction of one pollutant, the VOC cost effectiveness of the annual monitoring option is approximately

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[285] Based on Appendix B. Economic Analysis. State of California. Air Resources Board. *Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities*. pg. B-28. Notice Package for Oil and Gas Reg (ca.gov); State of California. *Air Resources Public Hearing to Consider the Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities*. Staff Report: Initial Statement of Reasons. Date of Release: May 31, 2016. pg. 99.

$810 per ton of VOC reduced for gathering and boosting ($160 per ton if gas savings are considered), $380 per ton of VOC reduced for the processing segment (net savings if gas savings are considered), $3,700 per ton of VOC reduced for the transmission segment, and $4,100 per ton of VOC reduced for the storage segment. Using the multipollutant approach, where half the cost of control is assigned to the methane reduction and half to the VOC reduction, the cost effectiveness of replacement of the reciprocating rod packing based on the annual monitoring approach is approximately $410 per ton of VOC reduced for gathering and boosting ($80 per ton if gas savings are considered), $190 per ton of VOC reduced for the processing segment (net savings if gas savings are considered), $1,850 per ton of VOC reduced for the transmission segment, and $2,040 per ton of VOC reduced for the storage segment.

We also assessed the incremental cost effectiveness of the annual monitoring option compared to the fixed 3-year/26,000 replacement schedule. Using the single pollutant approach, where all the costs are assigned to the reduction of one pollutant, the incremental cost effectiveness (without natural gas savings) from the fixed replacement option to the annual monitoring option for methane is approximately $130 per ton for gathering and boosting stations, $210 per ton for processing plants, $180 per ton for transmission stations, and $140 per ton for storage facilities. For VOC, the incremental cost effectiveness is approximately $480 per ton for gathering and boosting stations, $750 per ton for processing plants, $6,600 per ton for transmission stations, and $5,150 per ton for storage facilities.

The cost effectiveness of both options (fixed schedule and annual monitoring) are reasonable for methane and VOC using either the single pollutant or multipollutant approach. The incremental cost effectiveness in going from the fixed schedule option to the annual

monitoring option is reasonable for all scenarios, with the exception of VOC for transmission stations. Therefore, based on the consideration of the costs in relation to the emission reductions, the EPA finds that the annual monitoring option is the most reasonable option.

Further, as discussed above, California requires reciprocating compressor annual rod packing flow rate monitoring and repair and or replacement of the packing where flow rate monitoring indicates a measurement that exceeds 2 scfm. This further supports the reasonableness of a monitoring program.

Neither the fixed schedule rod packing replacement option nor the rod packing replacement based on annual monitoring option would result in secondary emissions impacts as both options would reduce the escape of natural gas from the piston rod. No wastes would be created (other than the worn packing that is being replaced) and no wastewater would be generated. An advantage related to the replacement of rod packing for reciprocating compressors based on annual rod packing monitoring is that it would only require replacement of the rod packing where monitoring of the rod packing indicates wear and increasing flow rate/emissions to unacceptable levels. This optimizes the output of capital expenditures to focus on emissions control where an increased emissions potential is identified.

In light of the above we determined that annual rod pack flow rate monitoring and replacement of the packing where flow rate monitoring indicates a measurement that exceeds 2 scfm represents BSER for NSPS OOOOb for this proposal for all segments including reciprocating compressors located at centralized productions facilities (with the exception of compressors at stand-alone well sites). As in the 2016 NSPS OOOOa, the EPA is proposing to allow the collection and routing of emissions to a process as an alternative standard because that

option would achieve emission reductions equivalent to, or greater than, the proposed standard for NSPS OOOOb.

The affected facility based on EPA's review would continue to be each reciprocating compressor not located at a well site, or an adjacent well site and servicing more than one well site. As discussed above, the EPA is proposing a new definition for a "centralized production facility". The EPA is proposing to define centralized production facilities separately from well sites because the number and size of equipment, particularly reciprocating and centrifugal compressors, is larger than standalone well sites which would not be included in the proposed definition of "centralized production facilities". Thus, the EPA is proposing that reciprocating compressors located at centralized production facilities would be subject to the standards in NSPS in OOOOb, but reciprocating compressors at well sites (standalone well sites) would not.

2. EG OOOOc

The EPA evaluated BSER for the control of methane from existing reciprocating compressors (designated facilities) in all segments in the Crude Oil and Natural Gas source category covered by the proposed NSPS OOOOb and translated the degree of emission limitation achievable through application of the BSER into a proposed presumptive standard for these facilities that essentially mirrors the proposed NSPS OOOOb.

First, based on the same criteria and reasoning as explained above, the EPA is proposing to define the designated facility in the context of existing reciprocating compressors as those that commenced construction on or before **[INSERT DATE OF PUBLICATION OF PROPOSED RULE IN THE FEDERAL REGISTER]**. Based on information available to the EPA, we did not identify any factors specific to existing sources that would indicate that the EPA should alter

this definition as applied to existing sources. Next, the EPA finds that the control measures evaluated for new sources for NSPS OOOOb are appropriate for consideration for existing sources under the EG OOOOc. The EPA finds no reason to evaluate different, or additional, control measures in the context of existing sources because the EPA is unaware of any control measures, or systems of emission reduction, for reciprocating compressors that could be used for existing sources but not for new sources. Next, the methane emission reductions expected to be achieved via application of the control measures identified above to new sources are also expected to be achieved by application of the same control measures to existing sources. The EPA finds no reason to believe that these calculations would differ for existing sources as compared to new sources because the EPA believes that the baseline emissions of an uncontrolled source are the same, or very similar, and the efficiency of the control measures are the same, or very similar, compared to the analysis above. This is also true with respect to the costs, non-air environmental impacts, energy impacts, and technical limitations discussed above for the control options identified.

The EPA has not identified any costs associated with applying these controls at existing sources, such as retrofit costs, that would apply any differently than, or in addition to, those costs assessed above regarding application of the identified controls to new sources. The cost effectiveness values for the proposed presumptive standard of replacement of the rod packing based on an annual monitoring threshold is approximately $230 per ton of methane reduced ($40 per ton if gas savings are considered) for the gathering and boosting segment (including reciprocating compressors located at centralized tank facilities), $110 per ton of methane reduced for the processing segment (net savings if gas savings are considered), $100 per ton of methane

reduced for the transmission segment, and $110 per ton of methane reduced for the storage segment.

In summary, the EPA did not identify any factors specific to existing sources, as opposed to new sources, that would alter the analysis above for the proposed NSPS OOOOb as applied to the designated pollutant (methane) and the designated facilities (reciprocating compressors). As a result, the proposed presumptive standard for existing reciprocating compressors is as follows.

For reciprocating compressors in the gathering and boosting segment (including reciprocating compressors located at centralized tank facilities), processing, and transmission and storage segments, the presumptive standard is replacement of the rod packing based on an annual monitoring threshold. Specifically, the presumptive standard would require an owner or operator of a reciprocating compressor designated facility to monitor the rod packing flow rate annually. When the measured leak rate exceeds 2 scfm (in pressurized mode), the standard would require replacement of the rod packing. As an alternative, the presumptive standard would be routing rod packing emissions to a process via a closed vent system under negative pressure.

F. Proposed Standards for Centrifugal Compressors

1. NSPS OOOOb

a. Background

The 2012 NSPS OOOO and the 2016 NSPS OOOOa applied to each wet seal compressor not located at a well site, or an adjacent well site and servicing more than one well site. The 2016 NSPS OOOOa required methane and VOC emissions be reduced from each centrifugal compressor wet seal fluid degassing system by 95.0 percent. Compliance with this requirement allowed routing of emission from the wet seal fluid degassing system to a control device or to a

process. Dry seal compressors were not subject to requirements under the 2016 NSPS OOOOa.

In determining BSER for wet seal compressors in 2016, the EPA determined that the previous determination for NSPS OOOO conducted in 2011/2012 still represented BSER for the control of VOC in 2016. In addition, the EPA determined that analogous control of methane represented BSER. In the 2012 determinations, the EPA conducted analyses of the cost and emission reductions of (1) requiring the conversion of a wet seal system to a dry seal system, and (2) routing to a control device or process. The 2011 NSPS OOOO rule proposed an equipment standard that would have required the use of dry seals to limit the VOC emissions from new centrifugal compressors. At that time, the EPA solicited comments on the emission reduction potential, cost, and any technical limitations for the option of routing the gas back to a low-pressure fuel stream to be combusted as fuel gas. In addition, in 2011, the EPA solicited comments on whether there are situations or applications where a wet seal is the only option, because a dry seal system is infeasible or otherwise inappropriate. The EPA received information indicating that the integration of a centrifugal compressor into an operation may require a certain compressor size or design that is not available in a dry seal model, and in the case of capture of emissions with routing to a process, there may not be down-stream equipment capable of handling a low-pressure fuel source. In the final 2012 NSPS OOOO rule, the EPA made the determination that the replacement of wet seals with dry seals and routing to a process was not technically feasible or practical for some centrifugal compressors, and also that the costs per ton of emissions reduced were reasonable for routing emissions to a control device or process. No other more stringent control options were evaluated at that time. During the development of the 2016 NSPS OOOOa rule, the EPA reviewed available information on control options for wet

seal compressors and did not identify any new information to indicate that this has changed.

For this review, the EPA also focused on these control options. BSER was evaluated for wet-seal centrifugal compressors at gathering and boosting stations (considered to be representative of emissions from centrifugal compressors at centralized production facilities) in the production segment, at natural gas processing plants, and at sites in the transmission and storage segment. During the development of the 2012 NSPS OOOO and 2016 NSPS OOOOa rulemakings, our data indicated that there were no centrifugal compressors located at well sites. Since the 2012 NSPS OOOO and 2016 NSPS OOOOa rulemakings, we have not received information that would change our understanding that there are no centrifugal compressors in use at well sites.

However, as discussed in section XI.L (Centralized Production Facilities) of this preamble, the EPA believes the definition of "well site" in NSPS OOOOa may cause confusion regarding whether centrifugal compressors located at centralized production facilities are also exempt from the standards. The EPA is proposing a new definition for a "centralized production facility". The EPA is proposing to define centralized production facilities separately from well sites because the number and size of equipment, particularly reciprocating and centrifugal compressors, is larger than standalone well sites which would not be included in the proposed definition of "centralized production facilities". This proposal is necessary in the context of centrifugal compressors to distinguish between these compressors at centralized production facilities where the EPA has determined that the standard should apply, and compressors at standalone well sites where the EPA has determined that the standard should not apply. In our current analysis, described below, we consider the centrifugal compressor gathering and boosting

segment emission factor as being representative of centrifugal compressor emissions located at centralized production facilities. As such, the EPA is proposing that centrifugal compressors located at centralized production facilities would be subject to the standards in NSPS OOOOb and the EG in OOOOc, but centrifugal compressors at well sites (standalone well sites) would not.

In addition to the requirement to reduce methane and VOC emissions from each centrifugal compressor wet seal fluid degassing system by 95.0 percent, the 2016 NSPS OOOOa requires compressor components to be monitored as fugitive emissions components and leaks found are to be repaired under the fugitive emissions monitoring requirements of 40 CFR 60.5397a. The monitoring frequency depends on source (*i.e.*, well sites, compressor stations) and sector segment. These fugitive emissions components were not considered part of the centrifugal compressor affected facility.

Based on the EPA's review of NSPS OOOOa, we are proposing that BSER continues to be that methane and VOC emissions be reduced from each centrifugal compressor wet seal fluid degassing system by 95.0 percent.

b. Description

Centrifugal compressors use a rotating disk or impeller to increase the velocity of the natural gas where it is directed to a divergent duct section that converts the velocity energy to pressure energy. These compressors are primarily used for continuous, stationary transport of natural gas in the processing and transmission systems. Some centrifugal compressors use wet (meaning oil) seals around the rotating shaft to prevent natural gas from escaping where the compressor shaft exits the compressor casing. The wet seals use oil which is circulated at high

pressure to form a barrier against compressed natural gas leakage. The circulated oil entrains and adsorbs some compressed natural gas that may be released to the atmosphere during the seal oil recirculation process. Off gassing of entrained natural gas from wet seal centrifugal compressors is not suitable for sale and is either released to the atmosphere, flared, or routed back to a process.

Some centrifugal compressors utilize dry seal systems. Dry seal systems minimize leakage by using the opposing force created by hydrodynamic grooves and springs. The hydrodynamic grooves are etched into the surface of the rotating ring affixed to the compressor shaft. When the compressor is not rotating, the stationary ring in the seal housing is pressed against the rotating ring by springs. When the compressor shaft rotates at high speed, compressed natural gas has only one pathway to leak down the shaft, and that is between the rotating and stationary rings. This natural gas is pumped between the grooves in the rotating and stationary rings. The opposing force of high-pressure natural gas pumped between the rings and springs trying to push the rings together creates a very thin gap between the rings through which little natural gas can leak. While the compressor is operating, the rings are not in contact with each other and, therefore, do not wear or need lubrication. O-rings seal the stationary rings in the seal case. Historically, the EPA has considered dry seal centrifugal compressors to be inherently low-emitting and has never required control of emissions from dry seal compressors. The EPA has received feedback[286], however, that there are some wet seal compressor system designs that are also low emitting when compared to dry seal compressors and is soliciting comment on lower emitting wet seal compressor system designs and dry seal compressor emissions in this proposed

[286] Conference Call. Prepared by Tora Consulting. December 19, 2018.

action.

The 2021 U.S. GHGI estimates over 166,700 metric tpy of methane emissions in 2019 from compressors from natural gas systems. For the natural gas processing and transmission segments, wet seal compressor methane emissions are estimated to be about 78,700 metric tons and dry seal compressor methane estimated emissions are estimated to be about 88,000 metric tons.[287] The wet seal and dry seal compressor methane emission estimates reflect the increasing prevalence of the use of dry seals over wet seals and emissions control requirements that require the control of emissions from wet seal compressors. The methane emissions from centrifugal compressors represent 3 percent of the total methane emissions from natural gas systems in the Oil and Natural Gas Industry sector.

c. Affected Facility

For purposes of the NSPS, the centrifugal compressor affected facility is a single centrifugal compressor using wet seals. A centrifugal compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under the proposed rule for NSPS OOOOb. As discussed above, the EPA is proposing that the affected facility includes centrifugal compressors located at centralized production facilities and the affected facility exception for "a well site, or an adjacent well site servicing more than one well site" applies to standalone well sites and not centralized production facilities.

d. 2021 BSER Analysis

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[287] U.S. Environmental Protection Agency. Inventory of U.S. Greenhouse Gas Emissions and Sinks (1990-2019). Published in 2021. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019

The methodology we used for estimating emissions from compressors is consistent with the methodology developed for the 2012 NSPS OOOO BSER analysis, which was also used to support the 2016 NSPS OOOOa BSER.[288] The wet-seal centrifugal compressor methane uncontrolled emission factors are based on the volumetric emission factors used for the GHGI, which were converted to a mass emission rate using a density of 41.63 pounds of methane per thousand cubic feet. The VOC emissions were calculated using the ratio of 0.278 pounds VOC per pound of methane for the production and processing segments, and 0.0277 pounds VOC per pound of methane for the transmission and storage segment. The resulting baseline uncontrolled emissions per centrifugal compressor are 157 tpy methane (43.5 tpy VOC) from wet-seal compressors at gathering and boosting sites, 211 tpy methane (58.7 tpy VOC) from wet-seal compressors at natural gas processing plants, 157 tpy methane (4.3 tpy VOC) from wet-seal compressors at transmission compressor stations, and 117 (3.24 tpy VOC) from wet-seal compressors at storage facilities. Since the emission factors for dry seal compressors are approximately lower than wet seal compressors,[289] the EPA considered requiring dry seals as a replacement to wet seals as a control option in 2011. The EPA proposed dry seals as a replacement to wet seals to control VOC emissions at that time. Based on comments received on the proposal that dry seal compressors were not feasible in all instances based on costs and technical reasons, the EPA did not finalize the proposal that dry seal compressors represented BSER. Instead, the EPA separately evaluated the control options for wet seal compressors (77 FR 49499-49500, 49523, August 16, 2012). In the 2015 NSPS OOOOa proposed rule, the EPA

[288] 2011 NSPS OOOO TSD, section 6.2.2; 2016 NSPS OOOOa TSD, section 7.2.2.
[289] 2011 NSPS OOOO TSD, Table 6-2, pg. 6-4; 2016 NSPS OOOOa TSD, Table 7-2, pg. 104.

maintained that available information since the 2012 NSPS OOOO rule continued to show that dry seal compressors cannot be use in all circumstances. The EPA has not identified any new information since that time that indicates that dry seal compressors as a replacement for wet seal compressors is technically feasible in all circumstances. Thus, we did not evaluate the replacement of a wet seal system with a dry seal system as BSER for controlling emissions from wet seal systems for the NSPS OOOOb proposal.

In addition to soliciting comment and information on lower-emitting wet seal compressor designs (that emit less than dry seal compressors), the EPA is soliciting information on dry seal compressor emissions. Feedback received (noted above) on lower emitting wet seal compressor designs included concern that lower emitting wet seal systems were being replaced by higher emitting (but still low emitting) dry seal systems because they were not subject to the NSPS. Given that the trend has been that wet seal compressor systems are increasingly being replaced by dry seal compressor systems, the EPA solicits comments on dry seal compressor emissions and whether/and to what degree operational or malfunctioning conditions (*e.g.*, low seal gas pressure, contamination of the seal gas, lack of supply of separation gas, mechanical failure) have the potential to impact methane and VOC emissions. The EPA also solicits comment on whether owners and operators implement standard operating procedures to identify and correct operational or malfunction conditions that have the potential to increase emissions from dry seal systems. Finally, the EPA solicits comments on whether we should consider evaluating BSER and developing NSPS standards for dry seal compressors.

The control options to reduce emissions from centrifugal compressors evaluated include control techniques that reduce emissions from leaking of natural gas from wet seal compressors

by capturing leaking gas and route it either to (1) a control device (combustion device), or (2) to the process. We evaluated the costs and impacts of both of these options.

Combustion devices are commonly used in the Crude Oil and Natural Gas Industry to combust methane and VOC emission streams. Combustors are used to control VOC and methane emissions in many industrial settings, since the combustor can normally handle fluctuations in concentration, flow rate, heating value and inert species content.[290] A combustion device generally achieves 95 percent reduction of methane and VOC when operated according to the manufacturer instructions. For this analysis, we assumed that the entrained natural gas from the seal oil that is removed in the degassing process would be directed to a combustion device that achieves a 95 percent reduction of methane and VOC emissions. This option was determined to be BSER under the 2011 NSPS OOOO and 2016 NSPS OOOOa rules. The combustion of the recovered gas creates secondary emissions of hydrocarbons (NOx, CO_2, and CO emissions). Routing the captured gas from the centrifugal compressor wet seal degassing system to a combustion device has associated capital and operating costs.

The capital and annual costs for the installation of a combustion device (an enclosed flare for the analysis) were calculated using the methodology in the EPA Control Cost Manual.[291] The capital costs of a flare and the equipment (closed vent system) necessary to route emissions to the flare are based on costs from the 2011 NSPS OOOO TSD and 2016 NSPS OOOOa TSD. These costs were updated to 2019 dollars. The updated capital costs of $80,930 were annualized

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[290] U.S. Environmental Protection Agency. AP 42, Fifth Edition, Volume I, *Chapter 13.5 Industrial Flares*. Office of Air Quality Planning & Standards. 1991.
[291] U.S. Environmental Protection Agency. *OAQPS Control Cost Manual: Sixth Edition* (EPA 452/B-02-001). Research Triangle Park, NC.

at 7 percent based on an equipment life of 10 years. The total annualized capital costs were estimated to be $11,520. The annual operating costs are also based on the 2011 NSPS OOOO TSD and 2016 NSPS OOOOa TSD. These costs were updated to 2019 dollars. The 2019 annual operating costs were estimated to be $117,160. The combined annualized capital and operating costs per compressor per year is an estimated $128,680. There is no cost savings estimated for this option because the recovered natural gas is combusted. The costs presented for gathering and boosting segment centrifugal compressors represent the estimated costs assumed for centrifugal compressors located at centralized production facilities.

Using the single pollutant approach, where all the costs are assigned to the reduction of one pollutant, the cost effectiveness of routing emissions from a wet seal system to a new flare for methane emissions is $870 per ton of methane reduced for the transmission segment and gathering and boosting, $640 per ton of methane reduced for the processing segment, and $1,160 per ton of methane reduced for the storage segment. Using the multipollutant approach, where half the cost of control is assigned to the methane reduction and half to the VOC reduction, the cost effectiveness of routing emissions from a wet seal system to a new flare for methane emissions is $430 per ton of methane reduced for the transmission segment and gathering and boosting, $320 per ton of methane reduced for the processing segment, and $580 per ton of methane reduced for the storage segment.

Using the single-pollutant approach, where all the costs are assigned to the reduction of one pollutant, the cost effectiveness of routing emissions from a wet seal system to a new flare for VOC emissions is $3,100 per ton of VOC reduced for gathering and boosting, $2,300 per ton of VOC reduced for the processing segment, $31,200 per ton of VOC reduced for the

transmission segment, and $41,800 per ton of VOC reduced for the storage segment. Using the multipollutant approach, where half the cost of control is assigned to the methane reduction and half to the VOC reduction, the cost effectiveness of routing emissions from a wet seal system to a new flare for VOC emissions is $1,600 per ton of VOC reduced for gathering and boosting, $1,200 per ton of VOC reduced for the processing segment, $15,600 per ton of VOC reduced for the transmission segment, and $20,900 per ton of VOC reduced for the storage segment.

In addition to an owner or operator having the option to capture emissions and routing to a new combustion control device, a less costly option that may be available could be for owners and operators to capture and route emissions to a combustion control device installed for another source (*e.g.*, a control device that is already on site to control emissions from another emissions source). The costs, which are provided in the NSPS OOOOb and EG TSD for this rulemaking, would be for the ductwork to capture the emissions and route them to the control device. The analysis assumes that the combustion control device on site achieves a 95 percent reduction in emissions of methane and VOC.

Another option for reducing methane and VOC emissions from the compressor wet seal fluid degassing system is to route the captured emissions back to the compressor suction or fuel system, or other beneficial use (referred to collectively as routing to a process). Routing to a process would entail routing emissions via a closed vent system to any enclosed portion of a process unit (*e.g.*, compressor or fuel gas system) where the emissions are predominantly recycled, consumed in the same manner as a material that fulfills the same function in the process, transformed by chemical reaction into materials that are not regulated materials, incorporated into a product, or recovered. Emissions that are routed to a process are assumed to

result in the same or greater emission reductions as would have been achieved had the emissions been routed through a closed vent system to a combustion device.[292] For purposes of this analysis, we assumed that routing methane and VOC emissions from a wet seal fluid degassing system to a process reduces VOC emissions greater than or equal to a combustion device (*i.e.*, greater than or equal to 95 percent). There are no secondary impacts with the option to control emissions from centrifugal wet seals by capturing gas and routing to the process.

The capital cost of a system to route the seal oil degassing system to a process is estimated to be $26,210 ($2,019),[293] The estimated costs include an intermediate pressure degassing drum, new piping, gas demister/filter, and a pressure regulator for the fuel line. The annual costs were estimated to be $2,880 (without savings) assuming a 15-year equipment life at 7 percent interest. Because the natural gas is not lost or combusted, the value of the natural gas represents a savings to owners and operators in the production (gathering and boosting) and processing segments. Savings were estimated using a natural gas price of $3.13 per Mcf, which resulted in annual savings of $27,000 per year at gathering and boosting stations and $36,400 per year at processing plants. The annual cost savings are much greater than the annual costs, which results in an overall savings when they are considered.

Using the single pollutant approach, where all the costs are assigned to the reduction of one pollutant, the cost effectiveness (without natural gas savings) of routing emissions from a wet seal system to a process for methane emissions is approximately $19 per ton of methane

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[292] U.S. Environmental Protection Agency. Control Techniques Guidelines for the Oil and Natural Gas Industry. Office of Air Quality Planning and Standards, Sector Policies and Programs Division. October 2016. EPA-453/B-16-001. (2016 CTG). pgs. 5-19 to 5-20.
[293] 2011 NSPS OOOO TSD, pg. 114; 2016 CTG, pg.5-20.

reduced for the transmission segment and gathering and boosting, $14 per ton of methane reduced for the processing segment, and $26 per ton of methane reduced for the storage segment. Using the multipollutant approach, where half the cost of control is assigned to the methane reduction and half to the VOC reduction, the cost effectiveness (without natural gas savings) of routing emissions from a wet seal system to a process for methane emissions is approximately $10 per ton of methane reduced for the transmission segment and gathering and boosting, $7 per ton of methane reduced for the processing segment, and $13 per ton of methane reduced for the storage segment. As noted above, there is an overall net savings if the value of the natural gas recovered is considered.

Using the single pollutant approach, where all the costs are assigned to the reduction of one pollutant, the cost effectiveness (without natural gas savings) of routing emissions from a wet seal system to a process for VOC emissions is approximately $70 per ton of VOC reduced for gathering and boosting, $50 per ton of VOC reduced for the processing segment, $700 per ton of VOC reduced for the transmission segment, and $940 per ton of VOC reduced for the storage segment. Using the multipollutant approach, where half the cost of control is assigned to the methane reduction and half to the VOC reduction, the cost effectiveness (without natural gas savings) of routing emissions from a wet seal system to a process for VOC emissions is approximately $35 per ton of VOC reduced for gathering and boosting, $26 per ton of VOC reduced for the processing segment, $350 per ton of VOC reduced for the transmission segment, and $470 per ton of VOC reduced for the storage segment. As noted above, there is an overall net savings if the value of the natural gas recovered is considered.

The cost effectiveness of both options (routing emissions to a combustion device or to a

process) are reasonable for methane for all of the evaluated segments, using both the single pollutant and multipollutant approaches. The cost effectiveness of routing emissions to a process are also reasonable for VOC for all of the evaluated segments, using both the single pollutant and multipollutant approaches. For routing emissions to a combustion device, the cost effectiveness is reasonable for the gathering and boosting and processing segments using the single pollutant and multipollutant approaches. Based on the consideration of the costs in relation to the emission reductions of both methane and VOC, the EPA finds that requiring emissions to be reduced from each centrifugal compressor using a wet seal by at least 95 percent (which can be achieved by either option) continues to be reasonable in the gathering and boosting (considered to be representative of emissions/costs from centrifugal compressors at centralized production facilities). processing, transmission and storage segments.

The 2012 NSPS OOOO and the 2016 NSPS OOOOa require emissions be reduced from each centrifugal compressor wet seal fluid degassing system by at least 95.0 percent by routing emissions to a control device or to a process. States have generally adopted/incorporated this NSPS level of control (or a level of control that is substantially similar) in their State regulations for the control of emissions from centrifugal compressor sources using wet seals. Owners and operators have successfully met this standard for almost a decade. These facts further demonstrate the reasonableness of this level of control. In the discussion above, we reviewed two options to reduce emissions from wet seal compressors that are both current regulatory options under the 2016 NSPS OOOOa: (1) Capturing leaking gas and route to a combustion device (flare), or (2) capturing leaking gas and route to the process. Under the 2016 NSPS OOOOa, the level of control determined based on BSER was that methane and VOC emissions be reduced

from each centrifugal compressor wet seal fluid degassing system by 95 percent or greater. The EPA has not identified any other control options or any other Federal, State, or local requirements that would achieve a greater reduction in methane and VOC emissions from centrifugal compressor wet seal systems. Although capturing leaking gas and routing to the process has the advantage of both reducing emissions by at least 95 percent or greater and capturing the natural gas (resulting in a natural gas savings), the EPA has received feedback in the development of the 2012 NSPS OOOO rule that this option may not be a viable option in situations where there may not be down-stream equipment capable of handling a low-pressure fuel source. During the development of the 2016 NSPS OOOOa rule, the EPA reaffirmed that information since the development of the 2012 NSPS OOOO rule continues to show that capturing leaking gas and routing to the process cannot be used in all circumstances. No new information has been identified since the development of the 2016 NSPS OOOOa rule to indicate that capturing leaking gas and routing to the process can be achieved in all circumstances (80 FR 56619, September 18, 2015). Thus, by establishing a 95 percent methane and VOC emissions control level as BSER, an owner or operator has the option of routing emissions to a process where it is a viable option, or to a combustion device where routing to a process is not a viable option. If an owner or operator chooses to route to a process to meet the 95 percent level of control, there are no secondary impacts. If an owner or operator chooses to route to a combustion device to meet the 95 percent level of control, the combustion of the recovered gas creates secondary emissions of hydrocarbons (NOx, CO_2, and CO emissions).

The costs, emission reductions, and cost effectiveness values were presented above for collecting the wet seal compressor emissions and routing them to both a combustion device and

to a process to achieve at least a 95 percent control. The EPA considers the cost effectiveness of both of these control options reasonable across all segments evaluated (*i.e.*, the gathering and boosting portion of production, processing, transmission, storage) for the reduction of methane emissions under the single pollutant approach and multipollutant approach. As discussed above, in our current analysis, we consider the centrifugal compressor gathering and boosting segment emission factor as being representative of centrifugal compressor emissions located at centralized production facilities. Thus, the cost analysis performed for the gathering and boosting segment represents the estimated costs of evaluated options for centrifugal compressors with wet seals located at centralized storage facilities.

In light of the above, we determined that reducing methane and VOC emissions from each centrifugal compressor wet seal fluid degassing system by 95 percent or greater continues to represent BSER for NSPS OOOOb for this proposal. The affected facility based on EPA's review would continue be each wet seal compressor not located at a well site, or an adjacent well site and servicing more than one well site. As discussed above, the EPA is proposing a new definition for a "centralized production facility". The EPA is proposing to define centralized production facilities separately from well sites because the number and size of equipment, particularly reciprocating and centrifugal compressors, is larger than standalone well sites which would not be included in the proposed definition of "centralized production facilities". Thus, the EPA is proposing that centrifugal compressors located at centralized production facilities would be subject to the standards in the NSPS in OOOOb, but centrifugal compressors at well sites (standalone well sites) would not.

2. EG OOOOc

The EPA evaluated BSER for the control of methane from existing centrifugal compressors using wet seals (not located at a well site, or an adjacent well site and servicing more than one well site) (designated facilities) in all segments in the Crude Oil and Natural Gas source category covered by the proposed NSPS OOOOb and translated the degree of emission limitation achievable through application of the BSER into a proposed presumptive standard for these facilities that essentially mirrors the proposed NSPS OOOOb.

First, based on the same criteria and reasoning as explained above, the EPA is proposing to define the designated facility in the context of existing centrifugal compressors using wet seals (not located at a well site, or an adjacent well site and servicing more than one well site) as those that commenced construction on or before **[INSERT DATE OF PUBLICATION OF PROPOSED RULE IN THE FEDERAL REGISTER]**. Based on information available to the EPA, we did not identify any factors specific to existing sources that would indicate that the EPA should alter this definition as applied to existing sources. Next, the EPA finds that the control measures evaluated for new sources for NSPS OOOOb are appropriate for consideration for existing sources under the EG OOOOc. The EPA finds no reason to evaluate different, or additional, control measures in the context of existing sources because the EPA is unaware of any control measures, or systems of emission reduction, for centrifugal compressors that could be used for existing sources but not for new sources. Next, the methane emission reductions expected to be achieved via application of the control measures identified above to new sources are also expected to be achieved by application of the same control measures to existing sources. The EPA finds no reason to believe that these calculations would differ for existing sources as compared to new sources because the EPA believes that the baseline emissions of an

uncontrolled source are the same, or very similar, and the efficiency of the control measures are the same, or very similar, compared to the analysis above. This is also true with respect to the costs, non-air environmental impacts, energy impacts, and technical limitations discussed above for the control options identified.

The EPA has not identified any costs associated with applying these controls at existing sources, such as retrofit costs, that would apply any differently than, or in addition to, those costs assessed above regarding application of the identified controls to new sources. The cost effectiveness values for the proposed presumptive standard of reducing methane emissions from each centrifugal compressor wet seal fluid degassing system by 95 percent or greater are based on the cost effectiveness of routing emissions from a wet seal system to a flare or to a process. The cost effectiveness of routing emissions from a wet seal system to a new flare for methane emissions is $870 per ton of methane reduced for the transmission segment and gathering and boosting, $640 per ton of methane reduced for the processing segment, and $1,160 per ton of methane reduced for the storage segment. The cost effectiveness (without natural gas savings) of routing emissions from a wet seal system to a process for methane emissions is approximately $19 per ton of methane reduced for the transmission segment and gathering and boosting, $14 per ton of methane reduced for the processing segment, and $26 per ton of methane reduced for the storage segment.

In summary, the EPA did not identify any factors specific to existing sources, as opposed to new sources, that would alter the analysis above for the proposed NSPS OOOOb as applied to the designated pollutant (methane) and the designated facilities (centrifugal compressors using wet seals). As a result, the proposed presumptive standard for existing centrifugal compressors

using wet seals is as follows.

For centrifugal compressors using wet seals in the gathering and boosting segment (including centrifugal compressors using wet seals located at centralized tank facilities), processing, and transmission and storage segments, the presumptive standard is to reduce methane emissions by at least 95 percent. An owner or operator can meet this presumptive standard by routing methane emissions to a control device or process that reduces emissions by at least 95 percent. As discussed previously, the EPA is proposing a new definition for a "centralized production facility". The EPA is proposing to define centralized production facilities separately from well sites because the number and size of equipment, particularly reciprocating and centrifugal compressors, is larger than standalone well sites which would not be included in the proposed definition of "centralized production facilities". Thus, the EPA is proposing that centrifugal compressors located at centralized production facilities would be subject to the standards in the EG in OOOOc, but centrifugal compressors at well sites (standalone well sites) would not.

G. Proposed Standards for Pneumatic Pumps

1. NSPS OOOOb

a. Background

In the 2016 NSPS OOOOa, the EPA established GHG (in the form of limitations on methane emissions) and VOC standards for natural gas-driven diaphragm pneumatic pumps located at well sites. This standard required that natural gas emissions be reduced by 95.0 percent by routing to an existing control device if: (1) A control device was onsite, (2) the control device could achieve a 95.0 percent reduction, and (3) it was technically feasible to route the emissions

to the control device. The standard did not require the installation of a control device solely for the purpose of complying with the 95.0 percent reduction for the emissions from pneumatic pumps. It also allowed the option of routing emissions to a process. At natural gas processing plants, the EPA established a standard that required a natural gas emission rate of zero (*i.e.*, that prohibited methane and VOC emissions from pneumatic pumps).

As a result of the review of these requirements and the previous BSER determination, the EPA is proposing methane and VOC standards in NSPS OOOOb for natural gas-driven pneumatic pumps located in all segments of the source category. Specifically, the EPA is proposing that each natural gas driven pneumatic pump is an affected facility. The EPA is proposing that methane and VOC emissions from natural gas-driven diaphragm and piston pumps at well sites and all other sites in the production segment be reduced by 95.0 percent or routed to a process, provided that there is an existing control device onsite or it is technically feasible to route the emissions to a process. For natural gas driven pneumatic pumps at natural gas transmission stations and natural gas storage facilities, the same requirement applies, but only to diaphragm pumps. The EPA is proposing to retain the technical infeasibility provisions of NSPS OOOOa for purposes of NSPS OOOOb. If there is a control device onsite,[294] the owner or operator is not required to route emissions to that control device if it is not technically feasible to do so, even for new construction sites which the EPA had previously referred to as "greenfield" sites. The EPA is also proposing to retain in NSPS OOOOb the exception to the 95.0 percent reduction requirement if there is a control device onsite that it is technically feasible

[294] For the same reasons discussed in section X.B.2, the EPA is proposing that boilers and process heaters are not control devises for purposes of controlling emissions from pneumatic pumps.

to route to that cannot achieve that level of reduction but can achieve a lower level of reductions. In those situations, the emissions from the pump are still to be routed to the control device and controlled at the level that the device can achieve. The EPA is also proposing a prohibition on methane and VOC emissions from pneumatic pumps (diaphragm and piston pumps) at natural gas processing plants. While zero emissions pneumatic pumps would not technically be affected facilities because they are not driven by natural gas, owners and operators should maintain documentation if they would like to be able to demonstrate to permit writers or enforcement officials that there are no methane or VOC emissions from the pumps and that these pumps are not affected facilities subject to the rule.

This BSER for reducing methane and VOC from pneumatic pumps are the same as those for the 2016 NSPS OOOOa, except that (1) the EPA determined that the NSPS OOOOa levels of control also represent BSER for diaphragm pumps at all sites in the production segment (including gathering and boosting stations), and for all transmission and storage sites, and (2) the EPA determined that the NSPS OOOOa levels of control also represent BSER for piston pumps (in addition to diaphragm pumps) in the production segment and at natural gas processing plants.

As discussed below, a primary reason that the EPA is unable to conclude that requiring a natural gas emission rate of zero for production and transmission and storage facilities is BSER at this time is because proven technologies that eliminate natural gas emissions rely on electricity to function. In contrast to pneumatic controllers, our review of information that has become available since the promulgation of the 2016 NSPS OOOOa standards, including State-level regulations for pneumatic pumps, does not demonstrate that zero emission technology for pneumatic pumps would be feasible at sites that lack access to onsite power. The EPA is

specifically soliciting comments on the possibility of subcategorizing production and natural gas transmission and storage sites into those sites that have access to onsite power and those that do not, and then determining BSER separately for each subcategory. Further, the EPA is soliciting comment on how, if at all, the proposed NSPS OOOOb standards for pneumatic controllers might factor into how the EPA ought to evaluate the possibility of requiring a natural gas emission rate of zero for pneumatic pumps in the production and transmission and storage segments. For example, if a site installs a solar-powered system to operate their controllers, then could that same system provide power to the pumps such that all pumps at the site could have zero emissions of natural gas?

b. Description

A pneumatic pump is a positive displacement reciprocating unit generally used by the Oil and Natural Gas Industry for one of four purposes: (1) Hot oil circulation for heat tracing/freeze protection, (2) chemical injection, (3) moving bulk liquids, and (4) glycol circulation in dehydrators. There are two basic types of pneumatic pumps used in the Oil and Natural Gas Industry, diaphragm pumps and piston pumps. Pumps used for heat tracing/freeze protection circulate hot glycol or other heat-transfer fluids in tubing covered with insulation to prevent freezing in pipelines, vessels and tanks. These heat tracing/freeze protection pumps are usually diaphragm pumps. Chemical injection pumps are designed to inject precise amounts of chemical into a process stream to regulate operations of a plant and protect the equipment. Typical chemicals injected in an oil or gas field are biocides, demulsifiers, clarifiers, corrosion inhibitors, scale inhibitors, hydrate inhibitors, paraffin dewaxers, surfactants, oxygen scavengers, and H_2S scavengers. These chemicals are normally injected at the wellhead and into gathering lines or at

production separation facilities. Since the injection rates are typically small, the pumps are also small. They are often attached to barrels containing the chemical being injected. These chemical injection pumps are primarily piston pumps, although they can be small diaphragm pumps. Examples of the use of pneumatic pumps to transfer bulk liquids at oil and natural gas production sites include pumping motor oil or pumping out sumps. Pumps used for these purposes ae typically diaphragm pumps.

Glycol dehydrator pumps recover energy from the high-pressure rich glycol/gas mixture leaving the absorber and use that energy to pump the low-pressure lean glycol back into the absorber. Glycol dehydrator pumps are controlled under the oil and gas NESHAPs (40 CFR 63, subparts HH and HHH), are not included as affected facilities for the 2016 NSPS OOOOa and were not included in the review for proposed NSPS OOOOb.

Both diaphragm and piston pumps are positive displacement reciprocating pumps, meaning they use contracting and expanding cavities to move fluids. These pumps work by allowing a fluid (*e.g.*, the heat transfer fluid, demulsifier, corrosion inhibitor, etc) to flow into an enclosed cavity from a low-pressure source, trapping the fluid, and then forcing it out into a high-pressure receiver by decreasing the volume of the cavity. The piston and diaphragm pumps have two major components, a driver side and a motive side, which operate in the same manner but with different reciprocating mechanisms. Pressurized gas provides energy to the driver side of the pump, which operates a piston or flexible diaphragm to draw fluid into the pump. The motive side of the pump delivers the energy to the fluid being moved in order to discharge the fluid from the pump. The natural gas leaving the exhaust port of the pump is either directly discharged into the atmosphere or is recovered and used as a fuel gas or stripping gas.

Diaphragm pumps work by flexing the diaphragm out of the displacement chamber, and piston pumps typically include plunger pumps with a large piston on the gas end and a smaller piston on the liquid end to enable a high discharge pressure with a varied but much lower pneumatic supply gas pressure.

As noted above, energy is supplied to the driver side of the pump to operate the piston or diaphragm. Commonly, this energy is provided by pressurized gas. This gas can be compressed air, or "instrument air," provided by an electrically powered air compressor. In many situations across all segments of this industry, electricity is not available, and this energy is provided by pressurized natural gas (*i.e.*, "natural gas-driven pneumatic pumps"). This energy can also be directly provided by electricity.

Natural gas-driven pneumatic pumps emit methane and VOC as part of their normal operation. These emissions occur when the gas used in the pump stroke is exhausted to enable liquid filling of the liquid cavity of the pump. Emissions are a function of the amount of fluid pumped, the pressure of the pneumatic supply gas, the number of pressure ratios between the pneumatic supply gas pressure and the fluid discharge pressure, and the mechanical inefficiency of the pump.

The 2021 U.S. GHGI estimates almost 215,000 metric tpy of methane emissions from pneumatic pumps in the oil and natural gas production segment in 2019. Specifically, this includes almost 113,000 metric tpy from natural gas production, 75,000 from petroleum production, and 26,000 from gathering and boosting compressor stations. These emissions make up 5 percent of all methane emissions in the GHGI for the combined gas and oil production segment, and 2 percent of all methane emissions for gathering and boosting. The overall total,

which represents 3 percent of the total methane emissions from this industry, does not include emissions from the processing, transmission, and storage segments which the EPA is now proposing to regulate under NSPS OOOOb.

c. 2021 BSER Analysis

BSER was evaluated for all segments of the industry. The 2015 NSPS OOOOa proposal included methane and VOC standards for pneumatic pumps in the production and transmission and storage segments. However, the EPA did not finalize regulations for pneumatic pumps at gathering and boosting stations in the final 2016 NSPS OOOOa due to lack of data on the prevalence of the use of pneumatic pumps at gathering and boosting stations. Since that time, GHGRP subpart W has required that emissions from natural gas-driven pneumatic pumps be reported from gathering and boosting stations. As reported above, the 2021 GHGI estimates over 26,000 metric tpy of methane emissions from these pumps in the gathering and boosting segment in 2019. Similarly, the EPA did not include pneumatic pumps in the transmission and storage segment in the final 2016 NSPS OOOOa because we did not have a reliable source of information indicating the prevalence of pneumatic pumps or their emission rates in the transmission and storage segment. While the GHGI does not include emissions from pneumatic pumps in the transmission and storage segment, and the GHGRP does not require the reporting of emissions from these pumps in this segment, State rules (notably the California rule and the proposed New Mexico rule) do include requirements for natural gas driven pneumatic pumps at transmission and storage facilities. The EPA is soliciting comment on whether natural gas driven pneumatic pumps are used in the natural gas transmission and storage segment and to what extent.

In 2015, the EPA identified several options for reducing methane and VOC emissions from natural gas-driven pumps in the production and natural gas transmission and storage segments: Replace natural gas-driven pumps with instrument air pumps, replace natural gas-driven pumps with solar-powered direct current pumps (solar pumps), replace natural gas-driven pumps with electric pumps, route natural gas-driven pump emissions to a control device, and route natural gas-driven pump emissions to a process. The only option identified in 2015 and analyzed at natural gas processing plants was the use of instrument air. The EPA re-evaluated that information as well as new information including updated GHGI and GHGRP information, as well as information from more recent State regulations. No additional options were identified at this time. Therefore, for this analysis for the NSPS, the EPA re-evaluated these options as BSER. In the discussion below, the options to require technology that would eliminate methane and VOC emissions by requiring the use of a non-natural gas driven pumps are discussed, followed by a discussion of routing natural gas driven pumps to a control device.

With the exception of the evaluation of instrument air systems, the BSER analysis for pneumatic pumps was conducted on an individual pump basis. Due to the differences in the level of emissions, we conducted the BSER analysis separately for natural gas-driven diaphragm pneumatic pumps and natural gas-driven piston pneumatic pumps for the production and transmission and storage segments. The emission factor for diaphragm pneumatic pumps is 3.46 tpy of methane, while it is only 0.38 tpy of methane for piston pumps. The corresponding VOC emission factors are 0.96 tpy for the production segment and 0.096 tpy for the transmission and storage segment for diaphragm pumps, and 0.11 and 0.01 tpy for piston pumps, for production and transmission and storage segment, respectively.

For instrument air systems, the BSER analysis was conducted using model plants that included combinations of diaphragm and piston pumps. For example, the smallest model plant included two diaphragm pumps and two piston pumps. Therefore, the cost effectiveness calculated for these instrument air systems represents the cost to eliminate emissions from both types of pumps. Since instrument air was the only option evaluated for natural gas processing plants, the BSER determination was made for all pumps at the plants (as opposed to separate determinations for diaphragm and piston pumps).

Zero Emissions Options

For this analysis, we first evaluated the options that would eliminate methane and VOC emissions from pneumatic pumps, specifically instrument/compressed air systems, electric pumps, and solar-powered pumps.

Instrument air systems require a compressor, power source, dehydrator, and volume tank. No alterations are needed to the pump itself to convert from using natural gas to instrument air. However, they can only be utilized in locations with sufficient electrical power. Instrument air systems are more economical and, therefore, more common at facilities with a high concentration of pneumatic devices and where an operator can ensure the system is properly functioning. Electric pumps provide the same functionality as gas-driven pumps and are only restricted by the availability of a source of electricity.

Solar-powered pumps are a type of electric pump, except that the power is provided by solar-charged direct current (DC). Solar-powered pumps can be used at remote sites where a source of electricity is not available, and they have been shown to be able to handle a range of throughputs up to 100 gallons per day with maximum injection pressure around 3,000 pounds

per square inch gauge (psig).

Production and Transmission and Storage Segments. For the production and transmission and storage segments, we evaluated the costs and impacts of these "zero-emissions" options (See Chapter 9 of the NSPS OOOOb and EG TSD for this rulemaking). We found that the cost-effectiveness of these options, for both diaphragm and piston pumps, were generally within the ranges that the EPA considers reasonable. However, for instrument air systems and electric pumps, our analysis assumes that electricity is available onsite. As noted above, in 2015, the EPA determined that a zero-emission standard for pumps in the production and transmission and storage segments was infeasible because (1) electricity is not available at all sites and (2) solar pumps are not technically feasible in all situations for which piston pumps and diaphragm pumps are needed. 80 FR 56625-56626. While we specifically requested comment on this determination in 2015, nothing was submitted at that time that caused a reversal in this decision. At this time, we are unclear as to whether these limitations have been overcome and whether zero-emission pneumatic pumps are technically feasible for all pneumatic pumps throughout the production and transmission and storage segments. Therefore, at this time, we are unable to conclude that this zero-emission option represents BSER in this proposal, but we are soliciting comment on this issue to better understand whether a zero-emission option is now technically feasible.

As explained in Section XII.C.1.e, the EPA believes that similar previously identified technical limitations have been overcome in the context of pneumatic controllers. Further, a few States do prohibit emissions from pneumatic pumps throughout the Crude Oil and Natural Gas Industry. California prohibits the venting of natural gas to the atmosphere from pneumatic pumps through the use of compressed air or electricity, or by collecting all potentially vented natural gas

with the use of a vapor collection system that undergoes periodic leak detection and repair. While California requires this, the fact that other States (*e.g.*, Colorado, Wyoming) do not require zero emissions from pneumatic pumps at all locations leads us to be uncertain as to whether it is technically feasible at this time. Canadian Provinces also regulate emissions from natural gas-driven pneumatic pumps. In British Columbia, pneumatic pumps installed after January 1, 2021, must not emit natural gas, and in Alberta, vent gas from pneumatic pumps installed after January 2, 2022, must be prevented. In addition, New Mexico has proposed a regulation that requires zero-emitting pumps, but only at production and transmission and storage sites that have access to electricity.

The EPA is soliciting comment on the basis for our proposed determination: That because electricity is not available at all sites and that there are applications at these sites where solar-powered pumps may not be feasible the Agency is uncertain as to whether the zero-emission options represent BSER. Also, as noted above, we are soliciting comment on an approach where the EPA would propose to subcategorize pneumatic pumps located in the production and transmission and storage sites based on availability of electricity and develop separate standards for each subcategory.

Natural gas processing plants. Natural gas processing plants are known to have a source of electrical power. Therefore, instrument air and electric pumps are technically feasible options at these facilities.

As the next step in the BSER determination, we evaluated capital and annual costs of compressed air systems for the natural gas processing plants. While electric pumps are an option at natural gas processing plants, we assumed that natural gas processing plants will elect to

always use instrument air and an impacts analysis for electric pumps was not conducted.

The capital costs for an instrument air system were estimated to range from $4,500 to $39,500. The annual costs include the capital recovery cost (calculated at a 7 percent interest rate for 10 years), labor costs for operations and maintenance, and electricity costs. These are estimated to range from $11,300 to $81,350. Because gas emissions are avoided as compared to the use of natural gas-driven pumps, the use of an instrument air system will have natural gas savings realized from the gas not released. The EPA estimates that each diaphragm pump replaced will save 201 Mcf per year of natural gas from being emitted and each piston pump will save of 22 Mcf per year in the processing segment. The estimated value of the natural gas saved, based on $3.13 per Mcf, would range from $1,400 to $35,000 per year per plant. The annual costs, including these savings, ranges from $9,900 to $46,500. More information on this cost analysis is available in the NSPS OOOOb and EG TSD for this proposal.

The resulting cost effectiveness, under the single pollutant approach where all the costs are assigned to the reduction of one pollutant, for the application of instrument air to achieve a 100 percent emission reduction at natural gas processing plants ranges from $420 to $1,470 per ton of methane eliminated. For VOC, these cost effectiveness values ranged from $1,520 to $5,290 per ton of VOC eliminated. Considering savings, these cost effectiveness values range from $240 to $1,300 per ton of methane eliminated and $870 to $4,600 per ton of VOC eliminated. Under the multipollutant approach where half the cost of control is assigned to the methane reduction and half to the VOC reduction, the cost effectiveness ranges from $210 to $730 per ton of methane eliminated and $760 to $2,640 per ton of VOC eliminated. Considering savings, the cost effectiveness values range from $120 to $650 per ton of methane eliminated and

from $440 to $2,320 per ton of VOC eliminated. These values are well within the range of what the EPA considers to be reasonable for methane and VOC using both the single pollutant and multipollutant approaches. As discussed above, the evaluation for instrument air systems is based on a combination of diaphragm and piston pumps. Therefore, this determination of reasonableness applies to both types of pumps at natural gas processing plants.

The 2016 NSPS OOOOa requires a natural gas emission rate of zero for pneumatic pumps at natural gas processing plants. Natural gas processing plants have successfully met this standard. Further, as discussed above several State agencies have rules that include this zero-emission requirement. This is a demonstration of the reasonableness of a natural gas emission rate of zero for pneumatic pumps at natural gas processing plants.

Secondary impacts from the use of instrument air systems are indirect, variable, and dependent on the electrical supply used to power the compressor. These impacts are expected to be minimal, and no other secondary impacts are expected.

In light of the above, we find that the BSER for reducing methane and VOC emissions from natural gas-driven piston and diaphragm pumps at gas processing plants is a natural gas emission rate of zero. This option results in a 100 percent reduction of emissions for both methane and VOC. Therefore, for NSPS OOOOb, we are proposing to require a natural gas emission rate of zero for all pneumatic pumps at natural gas processing plants.

Routing to a Control Device or VRU Options

Above we stated our determination that the EPA is unable to conclude that this zero-emission option represents BSER in this proposal for pumps in the production and transmission and storage segments. Therefore, we evaluated the use of control devices to reduce methane and

VOC emissions. This BSER analysis was conducted on an individual pump basis and diaphragm and piston pumps were evaluated separately.

Combustors (*e.g.,* enclosed combustion devices, thermal oxidizers and flares that use a high-temperature oxidation process) can be used to control emissions from natural gas-driven pumps. Combustors are used to control VOCs in many industrial settings, since the combustor can normally handle fluctuations in concentration, flow rate, heating value, and inert species content. The types of combustors installed in the Crude Oil and Natural Gas Industry can achieve at least a 95 percent control efficiency on a continuous basis. It is noted that combustion devices can be designed to meet 98 percent control efficiencies, and can control, on average, emissions by 98 percent or more in practice when properly operated. However, combustion devices that are designed to meet a 98 percent control efficiency may not continuously meet this efficiency in practice in the oil and gas industry due to factors such as variability of field conditions.

A related option for controlling emissions from pneumatic pumps is to route vapors from the pump to a process, such as back to the inlet line of a separator, to a sales gas line, or to some other line carrying hydrocarbon fluids for beneficial use, such as use as a fuel. Use of a VRU has the potential to reduce the VOC and methane emissions from natural gas-driven pneumatic pumps by 100 percent if all vapor is recovered. However, the effectiveness of the gas capture system and downtime for maintenance would reduce capture efficiency and therefore, we estimate that routing emissions from a natural gas-driven pump to a VRU and to a process can reduce the gas emitted by approximately 95 percent, while at the same time, capturing the gas for beneficial use.

Based on a 95 percent reduction, the reduction in emissions in the production segment

would be 3.29 tpy of methane and 0.91 tpy of VOC per diaphragm pump, and 0.36 tpy methane and 0.10 tpy VOC per piston pump. In the transmission and storage segment, the reduction in emissions would be 3.29 tpy of methane and 0.09 tpy of VOC per diaphragm pump, and 0.36 tpy of methane and 0.01 ton per year of VOC per piston pump.

Installation of a new combustion device or VRU. Costs for the installation of a new combustion device and a new VRU were evaluated. Installing a new combustion device has associated capital costs and operating costs. Based on the analysis conducted for the 2012 NSPS for a combustion device to control emissions from storage vessels, the capital cost for installing a new combustion device was $32,300 in 2008 dollars. We updated this to $38,500 to reflect 2019 dollars. Based on the life expectancy for a combustion device at 10 years, we estimate the annualized capital cost of installing a new combustion device to be $5,500 in 2019 dollars, using a 7 percent discount rate. The 2016 NSPS OOOOa TSD indicates the annual operating costs associated with a new combustion device were $17,000 in 2012 dollars, which we updated to $19,100 in 2019 dollars. Therefore, the total annual costs for a new combustion device are $24,600. Because the gas captured is combusted there are no gas savings associated with the use of a combustion device.

Installing a new VRU would also have both capital costs and maintenance costs. We based the costs of a VRU on the analysis conducted for the 2012 NSPS for control of emissions from storage vessels, which is representative of the costs that would be incurred for a VRU used to reduce emissions from natural gas-driven pneumatic pumps. The capital cost and installation costs for a new VRU are estimated to be $116,900 (in 2019 dollars) and the annual operation and maintenance costs estimated to be $11,200 (in 2019 dollars). The total annualized cost of a new

VRU is estimated to be $27,800, including the operation and maintenance cost and the annualized capital costs based on a 7 percent discount rate and 10-year equipment life.

Because there is potential for beneficial use of gas recovered through the VRU, the savings that would be realized for 95 percent of the gas that would have emitted and lost were estimated. The gas saved would equate to 191 Mcf per year from a diaphragm pump and 21 Mcf per year from a piston pump. This results in estimated annual savings of $600 per diaphragm pump and $65 per piston pump in the production segment. The resulting annual costs, considering these savings, are $27,200 per diaphragm pump and $27,700 per piston pump in the production segment. Transmission and storage facilities do not own the natural gas; therefore, savings from reducing the amount of natural gas emitted/lost was not applied for this segment. More information on these cost analyses is available in the NSPS OOOOb and EG TSD for this proposal.

The resulting cost effectiveness estimates for application of a new control device to reduce emissions from natural gas-driven pumps in the production segment by 95 percent, or the use of a VRU to route emissions back to a process, are discussed below under both the single pollutant approach, where all the costs are assigned to the reduction of one pollutant, and the multipollutant approach, where half the cost of control is assigned to the methane reduction and half to the VOC reduction. The results are presented separately for diaphragm and piston pumps. These values assume that the control device or VRU is installed solely for the purpose of controlling the emissions from a single natural gas-driven pneumatic pump, and only the emission reductions from a single pump are considered.

For diaphragm pumps in the production segment using the single pollutant approach, the

cost effectiveness is estimated to be $7,500 per ton of methane reduced using a new combustion device, and $8,500 using a new VRU ($8,300 with savings). For VOC, these cost effectiveness values are $26,900 per ton of VOC reduced using a new combustion device, and $30,400 using a new VRU ($29,800 with savings). These values are outside of the range considered reasonable by the EPA for both methane and VOC.

For diaphragm pumps in the production segment using the multipollutant approach, the cost effectiveness is estimated to be $3,750 per ton of methane reduced using a new combustion device, and $4,250 using a new VRU ($4,150 with savings). For VOC, these cost effectiveness values are $13,450 per ton of VOC reduced using a new combustion device, and $15,200 using a new VRU ($14,900 with savings). These values are outside of the range considered reasonable by the EPA for both methane and VOC.

For piston pumps in the production segment using the single pollutant approach, the cost effectiveness is estimated to be $68,100 per ton of methane reduced using a combustion device, and $77,000 using a VRU ($76,800 with savings). For VOC, these cost effectiveness values are $244,800 per ton of VOC reduced using a combustion device, and $277,000 using a VRU ($276,400 with savings). These values are outside of the range considered reasonable by the EPA for both methane and VOC.

For piston pumps in the production segment using the multipollutant approach, the cost effectiveness is estimated to be $34,000 per ton of methane reduced using a combustion device, and $38,500 using a VRU ($38,400 with savings). For VOC, these cost effectiveness values are $122,400 per ton of VOC reduced using a combustion device, and $138,500 using a VRU ($138,200 with savings). These values are outside of the range considered reasonable by the EPA

for both methane and VOC.

For diaphragm pumps in the transmission and storage segment using the single pollutant approach, the cost effectiveness is estimated to be $7,400 per ton of methane reduced using a new combustion device, and $8,500 using a new VRU. For VOC, these cost effectiveness values are $270,000 per ton of VOC reduced using a new combustion device, and $305,000 using a new VRU. These values are outside of the range considered reasonable by the EPA for both methane and VOC.

For diaphragm pumps in the transmission and storage segment using the multipollutant approach, the cost effectiveness is estimated to be $3,700 per ton of methane reduced using a new combustion device, and $4,200 using a new VRU. For VOC, these cost effectiveness values are $135,000 per ton of VOC reduced using a new combustion device, and $152,600 using a new VRU. These values are outside of the range considered reasonable by the EPA for both methane and VOC.

For piston pumps in the transmission and storage segment using the single pollutant approach, the cost effectiveness is estimated to be $68,000 per ton of methane reduced using a combustion device, and $77,000 using a VRU. For VOC, these cost effectiveness values are $2.5 million per ton of VOC reduced using a combustion device, and $2.8 million using a VRU. These values are outside of the range considered reasonable by the EPA for both methane and VOC.

For piston pumps in the transmission and storage segment using the multipollutant approach, the cost effectiveness is estimated to be $34,000 per ton of methane reduced using a combustion device, and $38,500 using a VRU. For VOC, these cost effectiveness values are $1.2

million per ton of VOC reduced using a combustion device, and $1.4 million using a VRU. These values are outside of the range considered reasonable by the EPA for both methane and VOC.

For diaphragm pumps, we do not consider the costs to be reasonable to install a new control device, or a new VRU to route the emissions to a process, for the production and transmission and storage segments for methane or VOC emission reduction using either the single pollutant or multipollutant approach. Similarly, for piston pumps, we do not consider the costs to be reasonable under any scenario. Therefore, we are unable to conclude that requiring the installation of a new control device, or the installation of a new VRU to route emissions to a process, to achieve 95 percent reduction of methane and VOC emissions from natural gas-driven pumps for the production or transmission segments represents BSER in this proposal.

Routing to an existing combustion device or VRU. In addition to evaluating the installation of a new control device or new VRU installed solely for the purpose of reducing the emissions from a single natural gas-driven pneumatic pump, we evaluated the option of routing the emissions from natural gas-driven pneumatic pumps to an existing control device to achieve a 95 percent reduction in methane and VOC emissions or routing the emissions to an existing VRU and to a process. The emission reduction for this option would be the same as discussed above for a new control device achieving 95 percent control, that is 3.29 tpy of methane and 0.91 tpy of VOC per diaphragm pump, and 0.36 tpy methane and 0.10 tpy VOC per piston pump in the production segment and 3.29 tpy of methane and 0.09 tpy of VOC per diaphragm pump, and 0.36 tpy of methane and 0.01 ton per year of VOC per piston pump in the transmission and storage segment. The resulting cost effectiveness estimates for use of an existing control device

to reduce emissions from natural gas-driven pumps in the production segment by 95 percent, or the use of an existing VRU to route emissions to a process, are discussed below under both the single pollutant approach, where all the costs are assigned to the reduction of one pollutant, and the multipollutant approach, where half the cost of control is assigned to the methane reduction and half to the VOC reduction. The results are presented separately for diaphragm and piston pumps.

We estimated the costs for routing emissions to an existing control device or VRU based on the average of the cost presented in the 2015 proposed NSPS OOOOa and the costs presented by two commenters to the proposal,[295] as documented in the 2016 NSPS OOOOa TSD. This yielded a capital cost estimate of $6,100 in 2019 dollars, for an annualized cost of $900 in 2019 dollars, using the 7 percent discount rate and 10-year equipment life. In the 2016 NSPS OOOOa TSD the EPA assumed there were no incremental operating costs for routing to an existing control device or VRU, so the total annual costs consist only of the $900 capital recovery cost. This assumption is maintained for this analysis. The same savings discussed above for the gas that is recovered by a VRU would be realized when routing to an existing VRU and to a process. These savings are $600 per year per diaphragm pump and $65 per year per piston pump in the production segment. The resulting annual costs for routing to an existing VRU and to process, considering these savings, are $270 per diaphragm pump and $800 per piston pump in the production segment. As noted above, transmission and storage facilities do not own the natural gas; therefore, savings from reducing the amount of natural gas emitted/lost was not applied for this segment.

[295] EPA-HQ-OAR-2010-0505-6884-A1 and EPA-HQ-OAR-2010-0505-6881.

For diaphragm pumps in the production segment using the single pollutant approach, the cost effectiveness is estimated to be $260 per ton of methane reduced using an existing combustion device, and $260 per ton of methane using an existing VRU ($80 with savings). For VOC, these cost effectiveness values are $950 per ton of VOC reduced using an existing combustion device, and $950 using an existing VRU ($300 with savings). For diaphragm pumps in the production segment using the multipollutant approach, the cost effectiveness is estimated to be $130 per ton of methane reduced using an existing combustion device, and $130 using an existing VRU ($40 with savings). For VOC, these cost effectiveness values are $475 per ton of VOC reduced using an existing combustion device, and $475 using an existing VRU ($150 with savings). These values are well within the range of what the EPA considers to be reasonable for methane and VOC using both the single pollutant and multipollutant approaches.

For diaphragm pumps in the transmission and storage segment using the single pollutant approach, the cost effectiveness is estimated to be $260 per ton of methane reduced using an existing combustion device, and $260 using an existing VRU. For VOC, these cost effectiveness values are $9,500 per ton of VOC reduced using an existing combustion device, and $9,500 using an existing VRU. For diaphragm pumps in the transmission and storage segment using the multipollutant approach, the cost effectiveness is estimated to be $130 per ton of methane reduced using an existing combustion device, and $130 using an existing VRU. For VOC, these cost effectiveness values are $4,800 per ton of VOC reduced using an existing combustion device, and $4,800 using an existing VRU. These values are within the range of what the EPA considers to be reasonable.

The 2016 NSPS OOOOa requires that emissions from natural gas driven pneumatic

pumps at well sites achieve a 95 percent reduction in methane and VOC emissions by routing them to a control device if an existing control device is on site. Owners and operators at well sites have successfully met this standard. Further, several State agencies (*e.g.*, California, proposed in New Mexico) have rules that include this requirement, and have extended the requirement to sites throughout the production segment as well as the transmission and storage segment. These factors considered together demonstrate the reasonableness of a requirement that emissions from natural gas driven pneumatic pumps at sites without access to electricity achieve a 95 percent reduction in methane and VOC emissions by routing them to a control device, provided that an existing control device is on site.

There are secondary impacts from the use of a combustion device to control emissions routed from natural gas-driven diaphragm pumps. The combustion of the recovered natural gas creates secondary emissions of hydrocarbons, NOx, CO_2, and CO. The EPA considers the magnitude of these emissions to be reasonable given the significant reduction in methane and VOC emissions that the control would achieve. Details of these impacts are provided in the NSPS OOOOb and EG TSD for this rulemaking. There are no other wastes created or wastewater generated. The secondary impacts from use of a VRU are indirect, variable, and dependent on the electrical supply used to power the VRU. No other secondary impacts are expected.

In light of the above, we find that the BSER for reducing methane and VOC emissions from natural gas-driven diaphragm pumps in the production and transmission and storage segments is to route the emissions to an existing control device that achieves 95 percent control of methane and VOC, or to route the emissions to an existing VRU and to a process. We are,

therefore, proposing to include this requirement in NSPS OOOOb.

For piston pumps in the production segment using the single pollutant approach, the cost effectiveness is estimated to be $2,400 per ton of methane reduced using a combustion device, and $2,400 using a VRU ($2,200 with savings). For VOC, these cost effectiveness values are $8,700 per ton of VOC reduced using a combustion device, and $8,700 using a VRU ($8,000 with savings).

For piston pumps in the production segment using the multipollutant approach, the cost effectiveness is estimated to be $1,200 per ton of methane reduced using a combustion device, and $1,200 using a VRU ($1,100 with savings). For VOC, these cost effectiveness values are $4,350 per ton of VOC reduced using a combustion device, and $4,350 using a VRU ($4,000 with savings).

For piston pumps in the production segment, we do not consider the costs to route emissions from a natural gas-driven pneumatic pump to an existing control device to achieve 95 percent reduction, or to route to an existing VRU and to a process, to be reasonable for methane or VOC using the single pollutant approach. However, the methane and VOC cost effectiveness using the multipollutant method is within the range that the EPA considers reasonable.

There are secondary impacts from the use of a combustion device to control emissions routed from natural gas-driven piston pumps. These impacts are the same as discussed above for diaphragm pumps.

In light of the above, we find that the BSER for reducing methane and VOC emissions from natural gas-driven piston pumps in the production and transmission and storage segments is to route the emissions to an existing control device that achieves 95 percent control of methane

and VOC, or to route the emissions to an existing VRU and to a process. We are, therefore, proposing to include this requirement for piston pumps in NSPS OOOOb.

The EPA notes that State rules for concerning natural gas-driven piston pumps emissions control requirements differ. For example, California specifically includes both diaphragm and piston pumps in the definition of pneumatic pumps, while Colorado specifically excludes piston pumps from control requirements. At this time, the EPA is unable to fully understand the basis for the piston pump State control requirement differences based on the background information for these State rules.

We are specifically seeking comment on the emissions factors used to estimate the baseline emissions from pneumatic pumps, which are from a 1996 EPA/GRI study.[296] The EPA is interested in more recent information regarding emissions from pneumatic pumps.

For piston pumps in the transmission and storage segment using the single pollutant approach, the cost effectiveness is estimated to be $2,400 per ton of methane reduced using a combustion device, and $2,400 using a VRU. For VOC, these cost effectiveness values are $87,000 per ton of VOC reduced using a combustion device, and $87,000 using a VRU.

For piston pumps in the transmission and storage segment using the multipollutant approach, the cost effectiveness is estimated to be $1,200 per ton of methane reduced using a combustion device, and $1,200 using a VRU. For VOC, these cost effectiveness values are $43,500 per ton of VOC reduced using a combustion device, and $43,500 using a VRU.

For piston pumps in the transmission and storage segment, we do not consider the costs

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[296] Gas Research Institute (GRI)/U.S. Environmental Protection Agency. 1996d. *Research and Development, Methane Emissions from the Natural Gas Industry, Volume 13: Chemical Injection Pumps*. June 1996 (EPA-600/R-96-080m).

to be reasonable to route emissions from a natural gas-driven pneumatic pump to an existing control device, or to route to an existing VRU and to a process, for either methane or VOC under the single pollutant approach. Further, we do not find that the cost effectiveness for both methane and VOC to be reasonable under the multipollutant approach. Therefore, we are unable to conclude that requiring the routing of emissions from natural gas-driven piston pumps in the transmission and storage segment to an existing control device to achieve 95 percent reduction of methane and VOC emissions, or the routing of emissions to a VRU and to a process, represents BSER for NSPS OOOOb in this proposal.

2. EG OOOOc

The EPA evaluated BSER for the control of methane from existing pneumatic pumps (designated facilities) in all segments in the Crude Oil and Natural Gas source category covered by the proposed NSPS OOOOb and translated the degree of emission limitation achievable through application of the BSER into a proposed presumptive standard for these facilities that mirrors the proposed NSPS OOOOb, with the exception of the BSER conclusion regarding piston pumps in the production segment.

First, based on the same criteria and reasoning explained above the EPA is proposing to define the designated facility in the context of existing pneumatic pumps as those that commenced construction on or before **[INSERT DATE OF PUBLICATION OF PROPOSED RULE IN THE FEDERAL REGISTER].** Based on information available to the EPA, we did not identify any factors specific to existing sources that would indicate that the EPA should alter this definition as applied to existing sources.

The EPA finds that the controls evaluated for new sources for NSPS OOOOb are

appropriate for consideration for existing sources under the EG OOOOc. The EPA finds no reason to evaluate different, or additional, control measures in the context of existing sources because the EPA is unaware of any control measures, or systems of emission reduction, for pneumatic pumps that could be used for existing sources but not for new sources. Next, the methane emission reductions expected to be achieved via application of the control measures identified above to new sources are also expected to be achieved by application of the same control measures to existing sources. The EPA finds no reason to believe that these calculations would differ for existing sources as compared to new sources because the EPA believes that the baseline emissions of an uncontrolled source are the same, or very similar, and the efficiency of the control measures are the same, or very similar, compared to the analysis above. This is also true with respect to the costs, non-air environmental impacts, energy impacts, and technical limitations discussed above for the control options identified.

The EPA has not identified any costs associated with applying these controls at existing sources, such as retrofit costs, that would apply any differently than, or in addition to, those costs assessed above regarding application of the identified controls to new sources. The cost effectiveness values for the option of zero emissions from pneumatic pumps in the natural gas processing sector range from $420 to $1,470 per ton of methane eliminated ($240 to $1,300 per ton considering savings). These cost effectiveness values are in the range considered reasonable by the EPA. However, as explained above in the context of new sources, at this time we are unclear as to whether the technical limitations associated with this option have been overcome and whether zero-emission pneumatic pumps are technically feasible. Therefore, at this time, we are unable to conclude that this zero-emission option represents BSER in this proposal for the

EG, but we are soliciting comment on this issue to better understand whether a zero-emission option is technically feasible.

For diaphragm pumps in the production segment the cost effectiveness is estimated to be $260 per ton of methane reduced using an existing (on site) combustion device or VRU, and $260 per ton of methane using an existing (on site) VRU ($80 with savings). For diaphragm pumps in the transmission and storage segment the cost effectiveness of is estimated to be $260 per ton of methane reduced using an existing (on site) combustion device, and $260 using an existing (on site) VRU. This cost effectiveness is considered reasonable by the EPA.

For piston pumps in the production segment the cost effectiveness is estimated to be $2,400 per ton of methane reduced using an existing (on site) combustion device or VRU, and $2,400 per ton of methane using an existing (on site) VRU ($2,200 with savings). For piston pumps in the transmission and storage segment the cost effectiveness is estimated to be $2,400 per ton of methane reduced using an existing (on site) combustion device, and $2,400 using an existing (on site) VRU. This cost effectiveness is outside of the range considered reasonable by the EPA. In summary, the EPA did not identify any factors specific to existing sources, as opposed to new sources, that would alter the analysis above for the proposed NSPS OOOOb as applied to the designated pollutant (methane) and the designated facilities (pneumatic pumps). However, the BSER conclusion regarding piston pumps in the production and transmission and storage segments for the EG differs from the conclusion for new sources under the NSPS. As a result, the proposed presumptive standards for existing pneumatic pumps are as follows.

For diaphragm pneumatic pumps in the production and transmission and storage segments, the presumptive standard is routing emissions to an existing (already on site) control

device or existing (already on site) VRU and to a process to achieve 95 percent reduction in methane. For pneumatic pumps (diaphragm and piston) in the natural gas processing sector, the presumptive standard is a natural gas emission rate of zero.

As for new sources, the EPA is specifically soliciting comment on whether the production and transmission storage segments should be subcategorized based on the availability of electricity and BSER determined separately for each subcategory in the EG.

H. Proposed Standards for Equipment Leaks at Natural Gas Processing Plants

1. NSPS OOOOb

a. Background

In the 2012 NSPS OOOO, the EPA established VOC standards for equipment leaks at onshore natural gas processing plants. These standards were based on the Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry (NSPS VVa), which is an EPA Method 21 LDAR program generally requiring monthly monitoring of pumps with a leak definition of 2,000 ppm, quarterly monitoring of valves with a leak definition of 500 ppm, and annual monitoring of connectors with a leak definition of 500 ppm.[297] In the 2016 NSPS OOOOa, the EPA added GHG (methane) to the title of the standards for equipment leaks at onshore natural gas plants but continued to rely on the requirements in NSPS VVa, which limited monitoring and repair (if found leaking) to those equipment components "in VOC service." Based on our review of the current standards, we are proposing to revise the equipment leak standards for onshore natural gas plants to more readily apply to

[297] 40 CFR part 60, subpart VVa includes "skip period" provisions that may alter the cited monitoring frequencies.

equipment components that have the potential to emit methane even though they are not "in VOC service."

b. Technology and LDAR Program Review

The EPA acknowledges that advancements are being made in leak detection, including remote sensing, sensor networks, and OGI. The EPA already provides use of OGI as an alternative work practice at 40 CFR 60.18(g); however, the alternative work practice requires annual EPA Method 21 monitoring as part of the OGI monitoring protocol. Parallel with this proposal, the EPA is proposing Appendix K to part 60 to provide a standard method for OGI leak monitoring. This allows us to consider a wider range of LDAR programs when evaluating the BSER for equipment leaks at onshore natural gas processing plants. To evaluate different LDAR programs, we used a Monte Carlo simulation that simulated initiation of leaks for pumps, valves, and connectors at monthly intervals based on component specific leak frequencies and EPA Method 21 leak size distributions based on historical EPA Method 21 leak data. We randomly assigned a mass emission rate based on the EPA Method 21 leak size assuming a lognormal distribution for the mass emission rate around the EPA Method 21 screening value correlation equation estimates. The simulation runs for five years for each LDAR program to build up leaks that might not be repaired under a given program, and compares the emissions estimated in the fifth year of the simulation for different LDAR programs. The model also records the number of repairs made in the fifth year of the simulation to assess the annual repair costs associated with the LDAR program. More information on the LDAR program Monte Carlo simulation and associated cost analyses is available in the NSPS OOOOb and EG TSD for this proposal.

Based on our model simulation of NSPS OOOOa requirements (Method 21 based LDAR program following the requirements in NSPS VVa), the EPA projects that the program achieves a 91.5 percent emission reduction for the components monitored. This is comparable to the projected control efficiencies of this LDAR program applied to similar industrial processes.[298] However, when considering the components not monitored at the onshore natural gas processing plant because they are not "in VOC service", the overall hydrocarbon control efficiency of the current NSPS OOOOa requirements drops to 73.2 percent. Thus, significant emission reductions can be achieved by extending the current provisions to include all components that have the potential to emit methane.

Based on our model simulation of an OGI-based LDAR program, we found that bimonthly OGI monitoring of all equipment components (with potential VOC or methane emissions) using devices capable of identifying mass leaks at 30 g/hr and at 15 g/hr would achieve emission reductions of 88.5 percent and 92.2 percent, respectively. Based on the requirements in Appendix K that the instrument be able to detect a methane leak of 17 g/hr, these results suggest that bimonthly OGI monitoring following Appendix K will achieve comparable emission reductions as the current NSPS OOOOa requirements for the equipment components subject to the monitoring requirements.

c. Control Options and 2021 BSER Analysis

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[298] EPA, October 2007. "*Leak Detection and Repair – A Best Practices Guide*." Office of Enforcement and Compliance Assurance. EPA-305-D-07-001. See "*Table 4.1 – Control effectiveness for an LDAR program at a chemical process unit and a refinery.*"

The EPA then evaluated various LDAR programs for their control efficiency, cost and cost effectiveness for a small and a large model natural gas processing plant. These "small" and "large" model plants were based on the number of components at each facility in various monitoring summaries for onshore natural gas processing plants.[299] We considered the (option 1) current NSPS OOOOa standards expanded to components that also have the potential to emit methane regardless of the VOC content of the stream, (option 2) bimonthly OGI following Appendix K for all components (VOC or methane), and (options 3 and 4) a hybrid approach following the current alternative work practice (regular OGI with annual EPA Method 21). For option 3 we evaluated requiring quarterly OGI with an annual EPA Method 21 survey at 10,000 ppm. For option 4 we evaluated requiring bimonthly OGI with an annual EPA Method 21 survey at 10,000 ppm. These control options and their associated costs are summarized in Tables 18 and 19 for the small and large model plants, respectively.

TABLE 18. SUMMARY OF CONTROL OPTIONS AND COSTS FOR SMALL MODEL PLANTS

Control Option	Emissions Reduction (tpy)		Capital Cost ($)	Annual Cost ($/yr)	CE[a] ($/ton VOC)	CE[a] ($/ton Methane)	Incremental ($/ton VOC)	Incremental ($/ton Methane)
	VOC	Methane						
Methane and VOC Service								
1	12.34	56.95	$17,700	$114,100	$9,200	$2,000	--	--
2	12.61	58.19	$1,500	$62,800	$5,000	$1,100	-$189,100	-$41,300
3	12.64	58.33	$19,200	$84,500	$6,700	$1,400	$696,200	$151,100
4	12.76	58.92	$19,200	$95,500	$7,500	$1,600	$87,000	$18,800

[a] Cost effectiveness (CE) compared to no monitoring.

[299] See Section 10.4 of Chapter 10 "Equipment Leaks from Natural Gas Processing Plants" in the TSD located at Docket ID No. EPA-HQ-OAR-2021-0317.

TABLE 19. SUMMARY OF CONTROL OPTIONS AND COSTS FOR LARGE MODEL PLANTS

Control Option	Emissions Reduction (tpy)		Capital Cost ($)	Annual Cost ($/yr)	CE[a] ($/ton VOC)	CE[a] ($/ton Methane)	Incremental ($/ton VOC)	Incremental ($/ton Methane)
	VOC	Methane						
Methane and VOC Service								
1	25.59	118.27	$36,200	$229,000	$9,000	$1,900	--	--
2	26.11	120.81	$3,000	$123,500	$4,700	$1,000	-$200,000	-$43,100
3	26.17	121.10	$39,200	$170,500	$6,500	$1,400	$760,000	$165,200
4	26.44	122.31	$39,200	$191,300	$7,200	$1,600	$79,500	$17,100

[a] Cost effectiveness (CE) compared to no monitoring.

We further assumed that all facilities outsource their equipment leak surveys. The first year "capital" costs of implementing an EPA Method 21 program (identifying components required to be monitored and developing a data system to track the proper frequency to monitor each component) are summarized in Tables 18 and 19. Additionally, these tables summarize the annualized costs of conducting a complete EPA Method 21 monitoring survey of all equipment (those in VOC service or contacting methane), which includes the annual costs of conducting required surveys and making the necessary repairs as well as annualized first year "capital" costs. The first-year startup costs for OGI surveys are small, estimated to be $750 for small plants and $1,500 for large plants. Because OGI surveys can be conducted much more quickly, the annualized cost of conducting bimonthly OGI surveys is approximately half the annualized cost of EPA Method 21 surveys through NSPS VVa. Both EPA Method 21 and OGI LDAR programs reduce loss of product. Therefore, the costs of the LDAR programs are offset to some degree to the emissions reduced. When evaluating LDAR programs that consider all components

(both VOC and methane), the annual value of the product not lost due to reduced emissions is approximately $14,000/yr.

Based on our analysis, the resulting cost effectiveness is reasonable for all of the options when assigning all costs to the reduction of methane. When assigning all costs to VOC reduction, however, only the bimonthly OGI option is considered reasonable at $5,000/ton VOC reduced for small plants and $4,700/ton VOC reduced at large plants. The EPA next considered the incremental cost-effectiveness between the four options to determine which option represents the BSER for equipment leaks at onshore natural gas processing plants. All four options achieve similar emission reductions, as discussed in the previous section. Bimonthly OGI (option 2) reduces an additional 2 tpy of methane at a cost savings. Adding annual EPA Method 21 to bimonthly OGI monitoring (option 4) reduces an additional 1.5 tpy methane for large model gas plant but at significant cost well above any costs the EPA would consider appropriate, at approximately $45,000/ton methane reduced (comparing option 4 with option 2). Therefore, the EPA does not consider it reasonable to require the additional of annual EPA Method 21.

Based on the discussion above, we consider a bimonthly OGI LDAR program following Appendix K that includes all equipment components that have the potential to emit VOC or methane to be BSER for new sources. Therefore, we are proposing this LDAR requirement for new sources under NSPS OOOOb. Because an EPA Method 21 monitoring program based on the requirements of NSPS VVa when applied to all equipment components that have the potential to emit VOC or methane is projected to achieve similar emission reductions, we are proposing that this EPA Method 21-based LDAR program may be used as an alternative to bimonthly OGI surveys.

In the development of the 2012 NSPS OOOO, we found that NSPS VVa provisions for PRDs, open-ended valves or lines, and closed vent systems and equipment designated with no detectable emissions were BSER. Available information since then continues to support this conclusion. Therefore, we are proposing to retain the current requirements in the 2016 NSPS OOOOa (which incorporates by reference specific provisions NSPS VVa) for PRDs, open-ended valves or lines, and closed vent systems and equipment designated with no detectable emissions, except expanding the applicability to sources that have the potential to emit methane. The EPA is soliciting information that would support the use of the proposed bimonthly OGI monitoring requirement for these equipment components in place of the NSPS VVa annual EPA Method 21 monitoring.

The EPA requests comments on ways to streamline approval of alternative LDAR programs using remote sensing techniques, sensor networks, or other alternatives for equipment leaks at onshore natural gas processing plants. Based on our Monte Carlo equipment leak model that assumes well-implemented LDAR programs with no delayed repair, both an EPA Method 21 based program following NSPS VVa and a bimonthly OGI monitoring program following Appendix K are projected to achieve a 91-percent emission reduction effectiveness. We request comment on whether providing such an emission reduction target and equipment leak modeling tool to simulate LDAR under similar "ideal" program implementation conditions may facilitate future equivalency determinations.

2. EG OOOOc

The application of an LDAR program at an existing source is the same as at a new source because there is no need to retrofit equipment at the site to achieve compliance with the work

practice standard. The cost effectiveness for implementing a bimonthly OGI LDAR program for all equipment components that have the potential to emit methane is approximately $850/ton methane reduced. As explained above, the cost effectiveness of this OGI monitoring option is within the range of costs we believe to be reasonable for methane reductions. Therefore, we consider a bimonthly OGI LDAR program following Appendix K that includes all equipment components that have the potential to emit methane to be BSER for existing sources.

I. Proposed Standards for Well Completions

1. NSPS OOOOb

a. Background

Pursuant to CAA section 111(b)(1)(B), the EPA reviewed the current standards in NSPS OOOOa for well completions and proposes to determine that they continue to reflect the BSER for reducing methane and VOC emissions during oil and natural gas well completions following hydraulic fracturing and refracturing. Accordingly, we are not proposing revisions to these standards. Provided below are a description of the affected facilities, the current standards, and a summary of our review.

Natural gas and oil wells all must be "completed" after initial drilling in preparation for production. Well completion activities not only will vary across formations but can vary between wells in the same formation. Over time, completion and recompletion activities may change due to the evolution of well characteristics and technology advancement. Well completion activities include multiple steps after the well bore hole has reached the target depth. Developmental wells are drilled within known boundaries of a proven oil or gas field and are located near existing well sites where well parameters are already recorded and necessary surface equipment is in

place. When drilling occurs in areas of new or unknown potential, well parameters such as gas composition, flow rate, and temperature from the formation need to be ascertained before surface facilities required for production can be adequately sized and brought on site. In this instance, exploratory (also referred to as "wildcat") wells and field boundary delineation wells typically either vent or combust the flowback gas.

One completion step for improving oil and gas production is to fracture the reservoir rock with very high-pressure fluid, typically a water emulsion with a proppant (generally sand) that "props open" the fractures after fluid pressure is reduced. Natural gas emissions are a result of the backflow of the fracture fluids and reservoir gas at high pressure and velocity necessary to clean and lift excess proppant to the surface. Natural gas from the completion backflow escapes to the atmosphere during the reclamation of water, sand, and hydrocarbon liquids during the collection of the multi-phase mixture directed to a surface impoundment. As the fracture fluids are depleted, the backflow eventually contains a higher volume of natural gas from the formation. Due to the specific additional equipment and resources involved and the nature of the backflow of the fracture fluids, completions involving hydraulic fracturing have higher costs and vent substantially more natural gas than completions not involving hydraulic fracturing.

During its lifetime, wells may need supplementary maintenance, referred to as recompletions (these are also referred to as workovers). Recompletions are remedial operations required to maintain production or minimize the decline in production. Examples of the variety of recompletion activities include completion of a new producing zone, re-fracture of a previously fractured zone, removal of paraffin buildup, replacing rod

breaks or tubing tears in the wellbore, and addressing a malfunctioning downhole pump. During a recompletion, portable equipment is conveyed back to the well site temporarily and some recompletions require the use of a service rig. As with well completions, recompletions are highly specialized activities, requiring special equipment, and are usually performed by well service contractors specializing in well maintenance. Any flowback event during a recompletion, such as after a hydraulic fracture, will result in emissions to the atmosphere unless the flowback gas is captured.

When hydraulic re-fracturing (recompletions) is performed, the emissions are essentially the same as new well completions involving hydraulic fracture, except that surface gas collection equipment will already be present at the wellhead after the initial fracture. The flowback velocity during re-fracturing will typically be too high for the normal wellhead equipment (separator, dehydrator, lease meter), while the production separator is not typically designed for separating sand.

Flowback emissions are a result of free gas being produced by the well during well cleanup event, when the well also happens to be producing liquids (mostly water) and sand. The high rate flowback, with intermittent slugs of water and sand along with free gas, is directed to an impoundment or vessels until the well is fully cleaned up, where the free gas vents to the atmosphere while the water and sand remain in the impoundment or vessels. Therefore, nearly all of the flowback emissions originate from the recompletion process but are vented as the flowback enters the impoundment or vessels. Minimal amounts of emissions are caused by the fluid (mostly water) held in the impoundment or vessels since very little gas is dissolved in the fluid when it enters the impoundment or vessels.

The 2021 GHGI estimates approximately 34,000 metric tpy of methane emissions from hydraulically fractured completion/workover natural gas well events and approximately 12,000 metric tpy of methane emissions from hydraulically fractured completion/workover oil well events in 2019.

b. Affected Facility

Each affected facility is a single well that conducts a well completion operation following hydraulic fracturing or refracturing.

c. Current NSPS Requirements

The current NSPS for natural gas and oil well completions and recompletions are the same. For well completions of hydraulically fractured (or refractured) wells, the EPA identified two subcategories of hydraulically fractured wells for which well completions are conducted: (1) Non-wildcat and non-delineation wells (subcategory 1 wells); and (2) wildcat and delineation wells and low-pressure wells (subcategory 2 wells). A wildcat well, also referred to as an exploratory well, is a well drilled outside known fields or is the first well drilled in an oil or gas field where no other oil and gas production exists. A delineation well is a well drilled to determine the boundary of a field or producing reservoir.

In the 2016 NSPS OOOOa rule, the EPA finalized operational standards for non-wildcat and non-delineation wells (subcategory 1 wells) that required a combination of REC and combustion. Because RECs are not feasible for every well at all times during completion or recompletion activities due to variability of produced gas pressure and/or inert gas concentrations, the rule allows for wellhead owners and operators to continue to reduce emissions when RECs are not feasible due to well characteristics (e.g., wellhead pressure or inert

gas concentrations) by using a completion combustion device. For wildcat and delineation wells and low-pressure wells (subcategory 2 wells), the EPA finalized an operational standard that required either (1) routing all flowback directly to a completion combustion device with a continuous pilot flame (which can include a pit flare) or, at the option of the operator, (2) routing the flowback to a well completion vessel and sending the flowback to a separator as soon as a separator will function and then directing the separated gas to a completion combustion device with a continuous pilot flame. For option 2, any gas in the flowback prior to the point when the separator will function was not subject to control. For both options (1) and (2), combustion is not required in conditions that may result in a fire hazard or explosion, or where high heat emissions from a completion combustion device may negatively impact tundra, permafrost, or waterways. Under the 2016 NSPS OOOOa rule, oil wells with a gas-to-oil ratio less than 300 scf of gas per stock tank barrel of oil produced are affected facilities but have no requirements other than to maintain records of the low GOR certification and a claim signed by the certifying official.

As discussed in section X.B.1 of this preamble, in the 2020 Technical Rule, the EPA made certain amendments (*e.g.*, related to the use of a separator, amended definition of flowback, amended recordkeeping and reporting requirements) to the VOC standards for well completions in the 2016 NSPS OOOOa, and is proposing to apply the same amendments to the methane standards for well completions in the 2016 NSPS OOOOa.

d. 2021 BSER Analysis

The two techniques considered under the previous BSER analyses that have been proven to reduce emissions from production segment well completions and recompletions include REC and completion combustion. REC is an approach that not only reduces emissions but delivers

natural gas product to the sales meter that would typically be vented. The second technique, completion combustion, destroys the organic compounds. No other emissions control techniques were identified as being required under other rules (Federal, State, or local rules) that would exceed the level of control required under the 2016 NSPS OOOOa rule. Therefore, no other technology control requirements were evaluated in this review.

Reduced emission completions, also referred to as "green" or "flareless" completions, use specially designed equipment at the well site to capture and treat gas so it can be directed to the sales line. This process prevents some natural gas from venting and results in additional economic benefit from the sale of captured gas and, if present, gas condensate. However, as the EPA has previously acknowledged, there are some limitations that may exist for performing RECs based on technical barriers. These limitations continue to exist. Three main limitations for performing a REC include the proximity of pipelines to the well, the pressure of the produced gas, and the inert gas concentration. These limitations are discussed below.

For exploratory wells (in particular), no nearby sales line may exist. The lack of a nearby sales line incurs higher capital outlay risk for exploration and production companies and/or pipeline companies constructing lines in exploratory fields. The EPA is soliciting comment on how "access to a sales line" and a "sales line" should be defined.

During the completion/recompletion process, the pressure of flowback fluids may not be sufficient to overcome the gathering line backpressure. In this case, combustion of flowback gas is one option, either for the duration of the flowback or until a point during flowback when the pressure increases to flow to the sales line. Another potential compressor application is to boost pressure of the flowback gas after it exits the separator. This technique is experimental because

of the difficulty operating a compressor where there is a widely fluctuating flowback rate.

Lastly, if the concentration of inert gas, such as nitrogen or CO_2, in the flowback gas exceeds sales line concentration limits, venting to the atmosphere or to a combustion device of the flowback may be necessary for the duration of flowback or until the gas energy content increases to allow flow to the sales line. Further, since the energy content of the flowback gas may not be high enough to sustain a flame due to the presence of the inert gases, combustion of the flowback stream would require a continuous ignition source with its own separate fuel supply.

Where a REC can be conducted, the achievable emission reductions vary according to reservoir characteristics and other parameters including length of completion, number of fractured zones, pressure, gas composition, and fracturing technology/technique. Based on several experiences presented at Natural Gas STAR technology transfer workshops, this analysis assumes 90 percent of flowback gas can be recovered during a REC.[300] Gas that cannot be recovered during a REC can be directed to a completion combustion device in order to achieve an estimated 95 percent reduction in overall emissions.

Completion combustion devices commonly found on drilling sites are generally crude and portable, often installed horizontally due to the liquids that accompany the flowback gas. These flares can be as simple as a pipe with a basic ignition mechanism and discharge over a pit near the wellhead. However, the flow directed to a completion combustion device may or may not be combustible depending on the inert gas composition of flowback gas, which would

[300] Memorandum to Bruce Moore, U.S. EPA from ICF Consulting. *Percent of Emissions Recovered by Reduced Emission Completions*. May 2011.

require a continuous ignition source. Sometimes referred to as pit flares, these types of combustion devices do not employ an actual control device and are not capable of being tested or monitored for efficiency. They do provide a means of minimizing vented gas and is preferable to venting.

The efficiency of completion combustion devices, or exploration and production flares, can be expected to achieve 90 percent, on average, over the duration of the completion or recompletion.[301] If the energy content of natural gas is low, then the combustion mechanism can be extinguished by the flowback gas. Therefore, it is more reliable to install an igniter fueled by a consistent and continuous ignition source. Because of the exposed flame, open pit flaring can present a fire hazard or other undesirable impacts in some situations (*e.g.*, dry, windy conditions and proximity to residences). As a result, owners and operators may not be able to combust unrecoverable gas safely in every case.

Noise and heat are the two adverse impacts of completion combustion device operations. In addition, combustion and partial combustion of many pollutants also create secondary pollutants including NO_x, CO, sulfur oxides (SO_x), CO_2, and smoke/particulates. The degree of combustion depends on the rate and extent of fuel mixing with air and the temperature maintained by the flame. Most hydrocarbons with carbon-to-hydrogen ratios greater than 0.33 are likely to smoke. The high methane content of the gas stream routed to the completion combustion device, it suggests that there should not be smoke except in specific circumstances (*e.g.*, energized fractures). The stream to be combusted may also contain liquids

[301] 77 FR 48889-48890, March 22, 2013 (Approval and Promulgation of Federal Implementation Plan for Oil and Natural Gas Well Production Facilities; Fort Berthold Indian Reservation (Mandan, Hidatsa, and Arikara Nation), North Dakota; Rule).

and solids that will also affect the potential for smoke.

The previous BSER analyses cost effectiveness per ton of methane and VOC emissions reduced per completion event evaluated for REC, completion combustion, and REC and completion combustion were updated to 2019 dollars. The results of this updated analysis are provided below, and details are provided in the NSPS OOOOb and EG TSD for this rulemaking.

The updated capital cost for performing a REC for a well completion or recompletion lasting 3 days is estimated to be $15,174 (2019 dollars). Monetary savings associated with additional gas captured to the sales line is estimated based on a natural gas price of $3.13 per Mcf. It was assumed that all gas captured would be included as sales gas. The updated capital and cost for wells including completion combustion devices resulted in an estimated average completion combustion device cost of approximately of $4,198 per well completion (2019 dollars). For both REC and completion combustion devices, the capital costs are one-time events, and annual costs were conservatively assumed to be equal to the capital costs. The EPA also evaluated the costs that would be associated with using a combination of a REC and completion combustion device. The annual costs would be a combined estimated capital and annual cost of $19,371 (2019 dollars). As a result of updating capital/annual costs to reflect 2019 dollars and decreasing the control efficiency assumed for completion combustion from 95 percent to 90 percent, the cost effectiveness estimates are slightly higher, but substantially similar to previous cost effectiveness BSER analysis control option estimates for natural gas well and oil well completions and recompletions.

For gas wells, under the single pollutant approach where all the costs are assigned to the reduction of methane emissions and zero to reduction of VOC, the cost effectiveness estimates

were approximately $1,180 per ton of methane reduced for REC ($990 with natural gas savings), $330 for completion combustion, and $1,420 for a combination of REC and completion combustion ($1,250 with natural gas savings). If all costs were assigned to VOC reduction and zero to methane reduction, the cost effectiveness estimates were approximately $4,230 per ton of VOC removed for REC ($3,570 with natural gas savings), $1,170 for completion combustion, and $5,110 for a combination of REC and completion combustion ($4,490 with natural gas savings). Under the multipollutant approach where half the cost of control is assigned to the methane reduction and half to the VOC reduction, these estimates are approximately $590 per ton of methane reduced for REC ($500 with natural gas savings), $160 for completion combustion, and $710 for a combination of REC and completion combustion ($630 with natural gas savings). For VOC, the cost effectiveness estimates were approximately $2,100 per ton of VOC removed for REC ($1,790 with natural gas savings), $590 for completion combustion, and $2,600 for a combination of REC and completion combustion ($2,250 with natural gas savings).

For oil wells, under the single pollutant approach where all the costs are assigned to the reduction of methane emissions and zero to reduction of VOC emissions, the cost effectiveness values were approximately $1,620 per ton of methane reduced for REC ($1,440 with natural gas savings), $450 for completion combustion, and $1,960 for a combination of REC and completion combustion ($1,790 with natural gas savings). Where all costs were assigned to reducing VOC emissions and zero to reducing methane emissions, the cost effectiveness estimates were approximately $5,840 per ton of VOC removed for REC ($5,190 with natural gas savings), $1,620 for completion combustion, and $7,070 for a combination of REC and completion combustion ($6,450 with natural gas savings). Under the multipollutant approach where half the

cost of control is assigned to the methane reduction and half to the VOC reduction, these estimates are approximately $810 per ton of methane reduced for REC ($720 with natural gas savings), $230 for completion combustion, and approximately $980 for a combination of REC and completion combustion ($900 with natural gas savings). For VOC, the cost effectiveness estimates were approximately $2,920 per ton of VOC removed for REC ($2,600 with natural gas savings), $810 for completion combustion, and $3,530 for a combination of REC and completion combustion ($3,220 with natural gas savings).

As noted above, the current NSPS OOOOa requirements consist of a combination of REC and completion combustion for hydraulically fractured natural gas and oil well completions. These techniques have been employed by the oil and gas industry since 2012 for natural gas well completions and 2016 for oil well completions. The EPA concludes that the cost effectiveness of REC, completion combustion, or a combination, for natural gas and oil wells are within the range that the EPA considers to be reasonable when considering both methane and VOC cost effectiveness. Since there are multiple scenarios where the cost effectiveness of the control measures is reasonable for natural gas and oil wells (including the cost effectiveness of VOC for REC and combined REC and completion combustion), we conclude that the overall cost effectiveness is reasonable.

There are secondary impacts from the use of a completion combustion device, as the combustion of the gas creates secondary emissions of hydrocarbons, NOx, CO_2, and CO. The EPA considers the magnitude of these emissions to be reasonable given the significant reduction in methane and VOC emissions that the control would achieve. Details of these impacts are provided in the NSPS OOOOb and EG TSD for this rulemaking. There are no other wastes

created or wastewater generated from either REC or completion combustion.

In light of the above, we determined that the current standards, which consist of a combination of REC and combustion, continue to represent the BSER for reducing methane and VOC emissions from well completions of hydraulically fractured or refractured oil and natural gas wells. We therefore propose to retain these standards in the proposed NSPS OOOOb.

As discussed in section XII.I.1.c, in the 2020 Technical Rule, the EPA made certain amendments to the VOC standards for well completions in the 2016 NSPS OOOOa. For the same reasons provided in the 2020 Technical Rule and discussed in section X.B.1 of this preamble for including these amendments for methane in NSPS OOOOa, the EPA is proposing to include these methane and VOC amendments for well completions in the NSPS OOOOb rule.

2. EG OOOOc

A well completion operation following hydraulic fracturing or refracturing is a "modification," as defined in CAA section 111(a), as each such well completion operation involves a physical change to a well that results in an increase in emissions; accordingly, each such operation would trigger the applicability of the NSPS. Therefore, there are no "existing" well completion operations of hydraulically fractured or refractured oil or natural gas wells. In light of the above, there are no proposed presumptive standards for such operations in this action.

J. Proposed Standards for Oil Wells with Associated Gas

1. NSPS OOOOb

a. Background

Wells in some formations and shale basins are drilled primarily for oil production. Although the wells are drilled for oil, the wells may produce an associated, pressurized natural

gas stream. The natural gas is either naturally occurring in a discrete gaseous phase within the liquid hydrocarbon or is released from the liquid hydrocarbons by separation. In many areas, a natural gas gathering infrastructure may be at capacity or unavailable. In such cases, if there is not another beneficial use of the gas at the site (*e.g.*, as fuel) the collected natural gas is either flared or vented directly to the atmosphere.

Emissions from associated gas venting and flaring are not regulated by either the 2012 NSPS OOOO or the NSPS OOOOa. The EPA did not evaluate BSER for associated gas production in either rulemaking. For this rulemaking, the EPA is proposing that methane and VOC emissions resulting from associated gas production be reduced by at least 95 percent.

b. Definition of Affected Facility

The EPA is proposing the definition of an oil well associated gas affected facility as an oil well that produces associated gas.

c. Description

In 2019, according to the EIA, the number of onshore gas producing oil wells in the U.S.[302] was 334,342 and the volume of vented and flared natural gas in 2019 was 523,066 million cubic feet.[303] According to the 2021 GHGI, in 2019 venting of associated gas emitted 42,051 metric tons of CH_4 and 1,291 metric tons of CO_2 and flaring of associated gas emitted

[302] *https://www.eia.gov/dnav/ng/ng_prod_oilwells_s1_a.htm*. The number of onshore gas producing oil wells was derived from the "U.S. Natural Gas Number of Oil Wells" subtracting "Federal Offshore--Gulf of Mexico" wells [336,732 – 2,390 = 334,342 wells]

[303] *https://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_VGV_mmcf_a.htm*. The volume of vented and flared natural gas was derived from "U.S. Natural Gas Vented and Flared" subtracting "Alaska--State Offshore" and "California--State Offshore" and "Federal Offshore--Gulf of Mexico" and "Louisiana--State Offshore" and "Texas--State Offshore" [538,479 – 825 - 0 – 14,461 – 45 – 82 = 523,066]

81,797 metric tons of CH_4 and 25,355,892 metric tons of CO_2.

For the 2019 reporting year in GHGRP subpart W, there were a total of 2,500 wells that reported emissions from the venting of associated gas emissions. The total emissions from these wells were just over 33,900 metric tons of methane (848,000 metric tons CO_2e). Over 90 percent of these methane emissions were reported in three basins – Gulf Coast, Williston, and Permian. Examining this information by State shows that almost half of the venting wells and over 64 percent of the methane emissions from the venting of associated gas occurs in Texas. Texas and North Dakota account for almost 90 percent of the reported methane emissions from vented associated gas oil wells. The average methane emissions from the venting of associated gas in 2019 was 13.6 metric tpy per venting well. The average per State ranges from 0.03 tpy per venting well in California to over 340 tpy per venting well in North Dakota.

The 2019 GHGRP subpart W data also show that there were over 38,000 wells reporting that they flared associated gas, with over 21 million metric tons of CO_2 emissions and over 68,000 metric tons of methane emissions. As with the venting emissions, the majority of the wells flaring associated gas (over 93 percent) were in the Gulf Coast, Williston, and Permian basins. Approximately 96 percent of the CO_2 and methane emissions were reported in these three basins. The majority of the wells flaring associated gas (over 72 percent) and emissions (over 87 percent) were from wells in Texas and North Dakota.

d. Control Options

For new and existing sources (oil wells), options to mitigate emissions from associated gas in order of environmental and resource conservation benefit include:

- Capturing the associated gas from the separator and routing into a gas gathering flow line

or collection system;

- Beneficially using the associated gas (*e.g.,* onsite use, natural gas liquid processing, electrical power generation, gas to liquid);
- Reinjecting for enhanced oil recovery; and
- Flaring with legally and practicably enforceable limits.

Typically, State oil and gas regulatory agencies (or, on certain public and Tribal lands, the BLM) regulate venting and flaring of associated gas from oil wells to ensure oil and natural gas resources are conserved and utilized in a manner consistent with their respective statutes. State oil and gas regulatory agencies typically encourage, and in some cases require, capture (conservation) over flaring, then flaring over venting. In addition, these State regulators have adopted a variety of approaches for regulating venting and flaring of associated gas from oil wells. Some require technical and economic feasibility analyses for continuing flaring beyond a certain time (*e.g.,* one year). Some require gas capture plans to track and incrementally increase the percentage of gas captured (rather than flared) over prescribed timelines and some of these include provisions to curtail production in the event of not meeting gas capture goals. Many State oil and gas regulations recognize that there are times when gas capture may not be feasible, such as when there is no gas gathering pipeline to tie into, the gas gathering pipeline may be at capacity, or a compressor station or gas processing plant downstream may be off-line, thus closing in the gas gathering pipeline. Venting is allowed by some State and regulatory agencies in certain circumstances such as emergency or upset conditions, during production evaluation, and well purging or productivity tests. In cases where venting is allowed, these rules typically

require reporting of the volume of gas flared and vented (and sometimes a gas analysis), while some States combine flaring and venting information together in publicly accessible well data.

Where flares are allowed, these State oil and gas regulations typically do not include monitoring, recordkeeping and reporting on the performance of the flare and would not be recognized as providing legally and practicably enforceable limits for CAA purposes. Some State environmental regulators address associated gas with a regulation stipulating flaring over venting that includes monitoring, recordkeeping and reporting provisions, while others regulate flaring over venting without monitoring requirements.

The EPA is interested in information on, and the feasibility, of options to utilize associated gas in some useful manner in situations where a sales line is not available. In addition to use as fuel, such options could include conversion technologies where methane is converted into hydrogen or other added value chemicals. The EPA is interested in information on these, as well as other, technologies.

e. 2021 BSER Analysis

In performing the BSER analysis for emissions from associated gas oil wells, we recognize there are similarities between the control options available for associated gas and those available for emissions from oil well completions. We are soliciting comment on these similarities. For both flowback emissions during oil well completions and associated gas production, if the infrastructure exists to allow the routing of the gas to a sales line (*e.g.,* "into a gas flow line or collection system"), owners and operators will almost always choose that option given the economic benefits of being able to sell the gas. For example, in the 2019 GHGRP subpart W data, applicable facilities reported over 1.2 trillion scf of associated gas was routed to

sales lines. This represents only a subset of the total volume of associated gas sent to a sales line, as GHGRP subpart W does not require reporting of this volume in subbasins where the company is not also reporting venting or flaring associated gas.

The environmental benefit of routing all associated gas to a sales line is significant, as there are no methane and VOC emissions. The EPA assumes that in situations where gas sales line infrastructure is available, there is minimal cost to owners and operators to route the associated gas to the sales line. While situations at well sites can differ, which would impact this cost, the EPA believes that in every situation the value of the natural gas captured and sold would outweigh these minimal costs of routing the gas to the sales line, thus resulting in overall savings. Given the prevalence of this practice, the environmental benefit, and the economic benefits to owners and operators, the EPA concludes that BSER is routing associated gas from oil wells to a sales line. The EPA seeks comment on this proposed BSER determination, including comment on how to define whether an oil well producing associated gas has access to a sales line for purposes of this BSER and what factors (such as proximity to an existing sales line) should bear on that determination.

NSPS OOOOa also includes other compliance options that achieve a 100 percent reduction in emissions from recovered flowback gas. These are "re-inject the recovered gas into the well or another well, use the recovered gas as an onsite fuel source, or use the recovered gas for another useful purpose that a purchased fuel or raw material would serve." 40 CFR 60 60.5375a(a)(1)(ii). The EPA believes that, for associated gas from oil wells, the options of using the gas as an onsite fuel source or for another useful purpose are also viable alternatives to routing to a sales line. However, a significant difference exists between the short-term and

relatively small volume of gas recovered during the limited duration of completion flowback versus the consistent flow of recovered gas from ongoing production from the well. Because of this difference, the EPA does not have information that supports re-injecting the associated gas into the well or another well as a viable emissions control alternative. Therefore, the EPA is specifically requesting comment on whether NSPS OOOOb should include re-injecting associated gas as an alternative to routing the gas to a sales line.

The format of the well completion provisions in NSPS OOOOa recognize that routing the recovered gas to a gas flow line or collection system, re-injecting the recovered gas, or using the recovered gas fuel or for another purpose may not be technically feasible. In these situations, owners and operators are required to route the flowback emissions to a completion combustion device.

Similarly, the EPA recognizes that there are associated gas oil wells where there is no access to a gas sales line. Therefore, as an aspect of BSER in these situations, the EPA evaluated the flaring of the associated gas as an option to control emissions for situations where access to a sales line is not available.

As discussed previously, the average annual methane emissions from the venting of associated gas reported in GHGRP subpart W for 2019 is 13.6 metric tpy (14.9 tpy) per venting well. Using a representative gas composition for the production segment, the estimated VOC emissions would be 4.15 tpy per well. We conducted the BSER analysis using this emissions level as a representative well.

The installation and proper operation of a flare can achieve 95 percent and greater reduction in methane and VOC emissions. To be conservative, a 95 percent emission reduction

was used for the BSER analysis. Therefore, the resulting emission reductions are 14.2 tpy methane and 3.9 tpy VOC.

The capital cost of a flare is estimated to be $5,719. This was based on a 2011 Natural Gas Star Pro Fact Sheet and updated to 2019 dollars. The resulting capital recovery, assuming a 7 percent interest rate and 15-year equipment life, was $628. The Natural Gas Star Pro report estimated the cost of the natural gas needed for the pilot was $1,800 per year. For this cost analysis, we assumed that this cost was not warranted since the associated gas could be used to fuel the pilot. We are soliciting comments on this cost estimate.

The EPA stresses that 95 percent or greater emission reduction is achievable if the flare is properly operated and maintained. In order to ensure that this occurs, the EPA proposes to apply the requirements in section 60.18 of the part 60 General Provisions to oil wells flaring associated gas. In order to account for the cost of the compliance with these requirements, we assumed that the associated cost would be 25 percent of the total annual costs, or an additional $160. This results in a total estimated annual cost of $785. We are soliciting comment on the estimated costs associated with compliance with the section 60.18 monitoring, reporting, and recordkeeping costs for flares used to control emissions of vented associated gas emissions, and whether those requirements would ensure the flare is achieving the proposed emission reduction of 95 percent or greater.

Based on these annual costs and the emission reductions cited above, the cost effectiveness, using the single pollutant method, is $55 per ton of methane reduction and $200 per ton of VOC reduction. Using the multipollutant approach, the cost effectiveness is $30 per ton of methane and $100 per ton of VOC. These cost effectiveness values are well within the

range considered reasonable by the EPA.

As discussed above, while flares significantly reduce the methane and VOC emissions, there are CO, CO_2, and NO_x emissions resulting from the combustion of the associated gas. We estimate that for the representative well, the annual emissions resulting from the flaring of the associated gas would be 50 tpy CO_2, 0.1 tpy CO, and 0.03 tpy NOx. While these secondary impacts are not negligible, the EPA notes that emissions from flaring represents over an 80 percent reduction in CO_2e emissions as compared to venting.

Based on our analysis, we find that the BSER for reducing methane and VOC emissions from associated gas venting at well sites is routing of the associated gas from oil wells to a sales line. In the event that access to a sales line is not available, we are proposing that the gas can be used as an onsite fuel source, used for another useful purpose that a purchased fuel or raw material would serve, or routed to a flare or other control device that achieves at least a 95 percent reduction in emissions of methane and VOC.

We are requesting comment on the affected facility definition and the overall format of the proposed requirements. The EPA is proposing that an associated gas oil well affected facility be each oil well that produces associated gas. The EPA is soliciting comments on how to define "associated gas" or an "oil well that produces associated gas." The proposed NSPS OOOOb would require that all associated gas be routed to a sales line. In the event that access to a sales line is not available, the proposed NSPS OOOOb would require that the gas can be used as an onsite fuel source, used for another useful purpose that a purchased fuel or raw material would serve, or routed to a flare or other control device that achieves at least a 95 percent reduction in emissions of methane and VOC.

Under this proposal, every oil well that produces associated gas would be an affected facility and therefore, subject to the rule. For those wells where the associated gas is routed to a sales line, the only requirement would be to certify that this is occurring. Wells that use the associated gas as a fuel or for another purpose would be required to document how it is used. If the associated gas is routed to a flare, all of the proposed monitoring, recordkeeping, and reporting requirements would apply.

As an alternative, the EPA is soliciting comments on defining the affected facility as each oil well that produces associated gas and does not route the gas to a sales line. This would significantly reduce the number of affected facilities, although the burden for owners and operators that route the gas to a sales line would be similar. While they would not be required under NSPS OOOOb to maintain documentation that the gas is routed to a sales line, they would still need to maintain documentation to prove that the well was not an affected facility. Under this alternative, the proposed rule would require that the gas be used as an onsite fuel source, used for another useful purpose that a purchased fuel or raw material would serve, or routed to a flare or other control device that achieves at least a 95 percent reduction in emissions of methane and VOC. The EPA's concern with this alternative is that while we believe that most owners and operators would route the gas to a sales line if there is access, it would not specifically require routing the gas to a sales line. We expect that the cost of a flare, along with the associated monitoring, reporting, and recordkeeping costs, will provide additional incentive for owners and operators to connect to an available sales line. We are requesting comment on how, under this alternative approach, to incentivize owners and operators even more to capture or beneficially use associated gas. The EPA is specifically requesting comment on whether the proposed

requirements will incentivize the sale or productive use of captured gas, and if not, other methods that the EPA could use to incentivize or require the sale or productive use instead of flaring.

2. EG OOOOc

The EPA evaluated BSER for the control of methane from existing associated gas oil wells that do not route the gas to a sales line or to a process for another beneficial use (designated facilities) and translated the degree of emission limitation achievable through application of the BSER into a proposed presumptive standard for these facilities that essentially mirrors the proposed NSPS OOOOb.

First, based on the same criteria and reasoning as explained above, the EPA is proposing to define the designated facilities in the context of those that commenced construction on or before **[INSERT DATE OF PUBLICATION IN FEDERAL REGISTER].** Based on information available to the EPA, we did not identify any factors specific to existing sources that would indicate that the EPA should change these definitions as applied to existing sources. As such, for purposes of the emission guidelines, the definition of a designated facility in terms of associated gas oil wells as existing oil wells with associated gas that do not route the gas to a sales line or to a process for another beneficial use.

Next, the EPA finds that the control options evaluated for new sources for NSPS OOOOb are appropriate for consideration in the context of existing sources under the EG OOOOc. The EPA finds no reason to evaluate different, or additional, control measures in the context of existing sources because the EPA is unaware of any control measures, or systems of emission reduction, for the venting of associated gas that could be used for existing sources but not for

new sources.

Next, the methane emission reductions expected to be achieved via application of the control measures identified above for new sources are also expected to be achieved by application of the same control measures to existing sources. The EPA finds no reason to believe that these calculations would differ for existing sources as compared to new sources because the EPA believes that the baseline emissions of an uncontrolled source are the same, or very similar, and the efficiency of the control measures are the same, or very similar, compared to the analysis above. This is also true with respect to the costs, non-air environmental impacts, energy impacts, and technical limitations discussed above for the control options identified.

The information presented above regarding the costs related to new sources and the NSPS are also applicable for existing sources. The EPA considers these cost effectiveness values to be reasonable. Since none of the other factors are different for existing sources when compared to the information from discussed above for new sources, the EPA concludes that BSER for existing sources and the proposed presumptive standard for EG OOOOc to be the requirement to route associated gas to a flare or other control device that achieves at least 95 percent control.

Related to control option of flaring with legally and practicably enforceable limits at existing oil wells specifically, enhancing monitoring and performance requirements for flares at existing oil wells may be an important emissions reduction measure. For those operators who have already installed monitoring capability on their existing flares, the additional investment may be minimal to cover reporting of performance. For those existing oil wells where operators do not have flare monitoring installed, the EPA solicits comment both on the flare performance

monitoring technology available and the cost of procuring, installing, operating and maintaining such technology. This could include, but is not limited to, digital pilot light monitors, combustion temperature, gas flow meters, gas chromatography (GC) units, and passive remote monitoring of combustion efficiencies at the flare tip. Similar technologies have been used for flares controlling landfill gas, including automated notifications of flare failure. Additional discussion of control devices, including flares, is included in section XIII.D of this preamble.

K. Proposed Standards for Sweetening Units

Sulfur dioxide (SO_2) standards for onshore sweetening units were first promulgated in 1985 and codified in 40 CFR part 60, subpart LLL (NSPS LLL). In 2012, the EPA reviewed the NSPS for the oil and natural gas sector, and the resulting 2012 NSPS OOOO rule incorporated provisions of NSPS LLL with minor revisions to adapt the NSPS LLL language to NSPS OOOO (77 FR 49489). The incorporated provisions required sweetening unit affected facilities to reduce SO_2 emissions via sulfur recovery. The EPA also increased the SO_2 emission reduction standard from the subpart LLL requirement for units with a sulfur production rate of at least 5 long tons per day (LT/D) from 99.8 percent to 99.9 percent. This change was based on the reanalysis of the original data used in the NSPS LLL BSER analysis.

In 2016, the EPA finalized the NSPS OOOOa rule – which established standards for both methane and VOCs for certain equipment, process and activities across the oil and natural gas sector. The final 2016 NSPS OOOOa rule reaffirmed and included the SO_2 emission reduction requirements as specified in the 2012 NSPS OOOO rule (81 FR 35824).

The EPA then amended the 2016 NSPS OOOOa rule in 2020 to correct an affected facility definition applicability error in the rule as it pertains to sweetening units. The 2016 NSPS

OOOOa rule erroneously limited the applicability of the SO_2 standards to sweetening units located at onshore natural gas processing plants. This limitation was not included in NSPS LLL, and no reason was identified as to "why the extraction of natural gas liquids relates in any way to the SO_2 standards such that the standards should only apply to sweetening units located at onshore natural gas processing plants engaged in extraction or fractionation activities" (85 FR 57398). Therefore, the 2020 NSPS OOOOa final rule amendments corrected the affected facility description applicability error to correctly define affected facilities as any onshore sweetening unit that processes natural gas produced from either onshore or offshore wells at 40 CFR 60.5365a(g).

A sweetening unit refers to a process device that removes H_2S and/or CO_2 from the sour natural gas stream (40 CFR 60.5430a) – *i.e.*, sweetening units convert H_2S in acid gases (*i.e.*, H_2S and CO_2) that are separated from natural gas by a sweetening process, like amine gas treatment, into elemental sulfur in the Claus process. These units can operate anywhere within the production and processing segments of the oil and natural gas source category, including as stand-alone processing facilities that do not extract or fractionate natural gas liquids from field gas (85 FR 57408, September 15, 2020)).

An estimated 6,900 tons of SO_2 emissions were reported under the National Emissions Inventory (NEI) for Year 2017[304] for Source Classification Code 31000201 (Industrial Processes Oil and Gas Production, Natural Gas Production, Gas Sweetening: Amine Process) and SCC 31000208 (Industrial Processes, Oil and Gas Production, Natural Gas Production, Sulfur Recovery Units).

[304] 2017 National Emissions Inventory (NEI) Data | US EPA

Pursuant to CAA section 111(b)(1)(B), the EPA reviewed the current standards in NSPS OOOOa (including the 2020 revisions) for sweetening units and proposes to determine that they continue to reflect the BSER for reducing SO_2 emissions. The EPA has not identified any greater emissions control level than what is currently required under NSPS OOOOa for sweetening unit affected facilities. Therefore, the EPA is proposing to retain/include the current NSPS OOOOa requirements for sweetening units for the control of SO_2 emissions from sweetening unit affected facilities in NSPS OOOOb. The proposed NSPS OOOOb maintains the requirement that each sweetening unit that processes natural gas produced from either onshore or offshore wells is an affected facility; as well as each sweetening unit that processes natural gas followed by a sulfur recovery unit. Units with a sulfur production rate of at least 5 long tons per day must reduce SO_2 emissions by 99.9 percent. Compliance with the standard is determined based on initial performance tests and daily reduction efficiency measurements. For affected facilities that have a design capacity less than 2 LT/D of H_2S in the acid gas (expressed as sulfur), recordkeeping and reporting requirements are required; however, emissions control requirements are not required. Facilities that produce acid gas that is entirely re-injected into oil/gas-bearing strata or that is otherwise not released to the atmosphere are also not subject to emissions control requirements.

XIII. Solicitations for Comment on Additional Emission Sources and Definitions

The EPA is considering including additional sources as affected facilities under the proposed NSPS OOOOb and the proposed EG OOOOc. Specifically, the EPA is evaluating the potential for establishing standards applicable to abandoned and unplugged wells, pipeline pigging and related blowdown activities, and tank truck loading operations. While the EPA has assessed these sources based on currently available information, we have determined that we

need additional information to evaluate BSER and propose NSPS and EG for these emissions sources. As described below, the EPA is soliciting information to assist in this effort.

The EPA is also assessing whether proposed standards that would require 95 percent reduction based on a combustion control device as the BSER (*e.g.,* standards for storage vessels, centrifugal compressors, pneumatic pumps, and associated gas that cannot be routed to a sales line or consumed for a useful purpose) could be further strengthened, including the potential for additional monitoring and associated recordkeeping and reporting requirements, to ensure proper design and operation of combustion control devices.

While we are not proposing NSPS nor EG for these emissions sources (*i.e.,* abandoned wells, pigging operations, or tank truck loading) or updates to ensure proper design and operation of combustion control devices in this action, the EPA is soliciting comment and information that would better inform the EPA as we continue to evaluate options for these sources. Should the EPA receive information through the public comment process that would help the Agency evaluate BSER for these emission sources, the EPA could consider NSPS and EG for these sources through a supplemental proposal. In this section we summarize the available information that we have evaluated regarding emissions, control options, and where specific States may have existing requirements, and we solicit specific comments. In the case of combustion control devices, we solicit comment on the current standard of 95 percent reduction and what additional monitoring, recordkeeping, and reporting may be appropriate to ensure compliance. We also generally solicit comment and information on the following topics associated with these emission sources.

The EPA solicits comment on the control options discussed below and how these controls

may be broadly applied across different basins or geographic areas. The EPA solicits comment on what equipment is onsite during these emission events. The EPA solicits comment on the technical feasibility of control options and any instances where it is not technically feasible to minimize emissions from these sources including, but not limited to, any retrofit concerns for existing sources. The EPA solicits comment on any practices owners and operators already implement as part of voluntary efforts or State requirements to minimize emissions from these sources. The EPA solicits comment on methods/approaches for estimating baseline emissions from these sources, estimating cost of control, and efficiency of control options. Finally, the EPA solicits comment on the cost of maintaining records and submitting reports for these emissions sources, including the types of records that are appropriate to maintain and report.

A. Abandoned Wells

The EPA is soliciting comment for potential NSPS and EG to address issues with emissions from abandoned, or non-producing oil and natural gas wells that are not plugged or are plugged ineffectively. Should the EPA receive information through the public comment process that would help the Agency evaluate BSER, the EPA may propose NSPS and EG through a supplemental proposal.

The EPA broadly characterizes abandoned wells as oil or natural gas wells that have been taken out of production, which may include a wide range of non-producing wells. This includes wells that State governments classify as idle, inactive, dormant, or shut-in, but not plugged. The classification varies from State to State, and State governments may allow these wells to be dormant, without plugging, for varying time periods that may last several years. It also includes wells with no production for many years—sometimes more than a decade-- and no responsible

operator. These wells are commonly referred to as orphaned, deserted, or long-term idle. Finally, this includes wells that have been abandoned for long periods, known as legacy wells. State governments have varied definitions of temporarily idled, orphaned, or non-producing wells.

It is the EPA's understanding that since non-producing oil and natural gas wells generally are not staffed and are seldom monitored, many have fallen into disrepair. The EPA recognizes that some States and NGOs also have elevated concerns about the potential number of low-production wells that could be abandoned in the near future as they reach the end of their productive lives. The 2021 GHGI estimates that in 2019 the U.S. population of abandoned wells (including orphaned wells and other non-producing wells) is around 3.4 million (about 2.7 million abandoned oil wells and 0.6 million abandoned natural gas wells).[305] These non-producing wells often have methane, CO_2, and VOC emissions. The most recent studies of emissions from abandoned wells focus on methane emissions, which are larger than the CO_2 or VOC emissions from such wells.[306] The GHGI estimates that abandoned oil wells emitted 209 kt of methane and 4 kt of CO_2 in 2019. While emissions of both pollutants from abandoned oil wells decreased by 10 percent from 1990, the total population of these wells increased 28 percent. The GHGI estimates that abandoned gas wells emitted 55 kt of methane and 2 kt of CO_2 in 2019. While emissions of both pollutants increased from abandoned gas wells by 38 percent from 1990, the total population of such wells increased 84 percent.

The large populations of abandoned unplugged wells are likely due to various

[305] The GHGI separates non-producing oil and gas wells into those that are unplugged and plugged. The abandoned wells identified in the GHGI include those that have been taken out of production temporarily, but can return to production, as well as orphan wells.
[306] See TSD at Docket ID No. EPA-HQ-OAR-2021-0317.

circumstances. For instance, some operators declare bankruptcy before wells are plugged, and for many, bonding requirements represent only a fraction of the actual costs to plug the well and restore the well site. Wells are also abandoned or idled when changing oil or natural gas prices make them unprofitable to continue production.

The EPA recognizes that many oil and natural gas producing States require the plugging of non-producing oil and natural gas wells, and subsequent restoration of the well site. However, the large number of abandoned, unplugged wells nationwide suggests that Federal standards may be warranted. Many oil and gas producing States specify the time in which wells may remain in idle status without State approval. At the end of that time, States generally require tests of well integrity before giving approval for additional time in this idle status.

In its 2018 survey of idled and abandoned wells, the IOGCC documented State definitions and requirements for idled wells, as well as the management plans for those wells.[307] There is variation in how States define these idle wells, ranging from no definitions to specific definitions for documented and undocumented orphaned and abandoned wells. Further, there is great variability in the allowance for the length of time a well may remain in idle status with or without approval, with some States limiting that time to a few months while other States allow idled status indefinitely. While some States require strict management plans of idled wells, others do not. Finally, some States provide funds for plugging, remediating, and reclaiming orphan wells, and others do not. These funds are supported by civil penalties, settlements, forfeited bonds, and State appropriations. The IOGCC's survey found that 28 States and Canadian provinces have wells approved to remain in idle status, with most having between 100

[307] See IOGCC Report located at Docket ID No. EPA-HQ-OAR-2021-0317.

and 10,000 approved idle wells. Most States and provinces maintain inventories of documented orphan wells and prioritize orphan wells for plugging according to risk. States and provinces reported from zero to 13,266 documented orphan wells, with about half reporting fewer than 100 orphan wells.

The IOGCC's 2018 survey also collected estimates from some States on the number of undocumented orphan wells, including those for which no permits or other records exist. Most of these wells were drilled before there was any regulatory oversight. Ten States reported no undocumented orphan wells. Nine other States did not provide an estimate. Eleven States provided an estimate ranging from fewer than 10 to 100,000 or more undocumented orphan wells. Most of the States surveyed by the IOGCC had established funds dedicated to plugging orphan wells. Money for these funds comes primarily from taxes, fees, or other assessments on the oil and gas industry.

The EPA has identified the following potential strategies to reduce air emissions from these sources. The first strategy is to employ practices and procedures to ensure proper well closure. Under this strategy, the EPA could focus on well closure requirements aimed at preventing future abandonment of unplugged wells and halt the growth of this unplugged population. Given that all wells eventually reach their end of life, this strategy could be applied to both new and existing wells. Under the NSPS, for example, the EPA could require owners or operators to submit a closure plan describing when and how the well would be closed and to demonstrate whether the owner or operator has the financial capacity to continue to demonstrate compliance with the rules until the well is closed and to carry out any required closure procedures per the rule. This demonstration could require some financial assurance or bonding if

the Agency determines the financial capacity of the owner or operator to continue to assure compliance with the rule is in doubt. The EPA also could require reporting any transfer of well ownership, along with a copy of the well closure requirements, to the EPA and/or the applicable State when transferring ownership. The Agency might also consider a requirement to temporarily close the well to the atmosphere with a swedge and valve or packer or other approved method once a well is temporarily abandoned or shut in. As one example, this is a requirement under Colorado law for all wells that are designated as shut in or temporarily abandoned.[308]

The primary purpose of detailing financial capacity as part of a compliance plan, and to potentially require some financial assurance bonding, is to ensure that State governments have adequate resources to plug oil and gas wells when the owner or operator is unwilling or unable to do so. The IOGCC notes that States typically have requirements for both single-well or blanket financial assurance. In the IOGCC's 2018 survey, 35 States reported information on the types of financial assurance accepted in their jurisdictions, with most accepting more than one type. The IOGCC noted that the amounts and criteria for bonding vary considerably among the States. Single-well bond amounts range from $1,500 to $500,000 per well; blanket bonds (covering multiple wells) vary from $7,500 to $30,000,000, the IOGCC said. In some States, bond amounts are based on well depth; in others, bond amounts are based on case-by-case evaluations; and in several, bond amounts may be increased if determined necessary.

That study identified the following types of financial assurance, including cash deposit of a payment given as a guarantee that an obligation will be met, certificate of deposit of a financial

[308] Code of Colorado Regulations, Oil and Gas Conservation Commission, 2 CCR 404-1, paragraph b, "Temporary Abandonment," p. 80.

instrument certifying that the face amount is on deposit with the issuing bank to be redeemed for cash by the State if required, financial statements of a report of basic accounting data that depicts a firm's financial history and activities, letter of credit, irrevocable letter of credit where payment is guaranteed if stipulated conditions are met, security interest giving the right to take property or a portion of property offered as security, and surety or performance bonds as a contract by which one party agrees to make payment on the default or debt of another party. Other forms of financial assurance include certificates of insurance, consolidated financial funds, escrow accounts, and liens. The amounts and criteria for financial assurance vary considerably among the States and provinces.

Another strategy under consideration is to require fugitive emissions monitoring at a specified frequency for the duration of time the well is idled and unplugged. The EPA's understanding, however, is that most idled and non-producing well sites would be classified as wellhead only sites, which the EPA is proposing to exclude from fugitive emissions monitoring for both new and existing well sites (see section XI.A).

The EPA is aware that other Federal agencies have information on, and experience with, abandoned wells, such as the U.S. Forest Service, National Park Service, U.S. Fish and Wildlife Service, and the BLM. On Federal and Tribal mineral estate, the BLM coordinates with the surface management agency when remediating abandoned wells to mitigate the potential risks those wells may pose. The EPA may be informed by the methods employed by the BLM to monitor and remediate abandoned wells on Federal lands, as well as by draft legislative initiatives that may expand the scope of the BLM's efforts. The EPA understands that one such initiative, the "Revive Economic Growth and Reclaim Orphaned Wells (REGROW) Act," could

amend the Energy Policy Act of 2005 to require the BLM to establish a new program to plug, remediate, and reclaim orphaned oil and gas wells and surrounding land, and to provide funds to State and Tribal governments for this purpose.[309]

The EPA is soliciting additional information that would support a determination of the BSER to address emissions from abandoned, idled, and non-producing wells. The specific information of interest includes updates to the number of abandoned, orphaned, or temporarily idled wells in the U.S., which could be State-specific or basin-specific; fugitive emission estimates for the wells; and costs of mitigation measures, including effective closure requirements and proper plugging practices, financial assurance mechanisms, and requiring fugitive emissions monitoring while in idled and unplugged status. The EPA is also soliciting information on mechanisms to disincentivize operator delay in permanently abandoning wells and/or transfer of late-life assets to companies that may not be well-positioned to fund proper closure. The EPA also solicits information at the State level, on the length of time that wells remain temporarily idled before they must be inspected by State governments. Further, we are seeking information about what would be included in well closure requirements, including what closure requirements are appropriate and any recordkeeping and reporting associated with those requirements, as well as whether it is appropriate to close the well to the atmosphere once it is designated as shut in or temporarily abandoned. The EPA also solicits information on whether

[309] S. 1076, "To amend the Energy Policy Act of 2005 to require the Secretary of the Interior to establish a program to plug, remediate, and reclaim orphaned oil and gas wells and surrounding land, to provide funds to State and Tribal governments to plug, remediate, and reclaim orphaned oil and gas wells and surrounding land, and for other purposes," 117th Congress, 1st Session, as introduced on April 12, 2021, available at https://www.congress.gov/117/bills/s1076/BILLS-117s1076is.xml.

compliance assurance for well closure requirements will necessitate certain forms of financial assurance on the part of well owners and operators. The EPA solicits comment on effective plugging, such as criteria or guidelines are necessary for sufficient plugging and post-plugging follow up monitoring necessary over a certain time period. Finally, the EPA solicits comments on the cost of monitoring idled or abandoned wells or monitoring techniques that might lower the costs of such monitoring.

B. Pigging Operations and Related Blowdown Activities

The EPA is soliciting comment for potential NSPS and EG under consideration that include addressing emissions from pipeline pigging and related blowdown activities. Should the EPA receive information through the public comment process that would help the Agency evaluate BSER, the EPA may propose NSPS and EG through a supplemental proposal.

Raw natural gas is transported from production wells to natural gas processing plants through networks of gathering pipelines. After natural gas processing, pipeline networks in the transmission and storage segment transport the gas to downstream customers. Raw natural gas is frequently saturated with hydrocarbons and may contain other components such as water, carbon dioxide, and hydrogen sulfide, especially upstream of the natural gas processing plant. Liquid condensates can accumulate in low elevation segments of the gathering pipelines, impeding the flow of natural gas. To maintain gas flow and operational integrity of the gathering pipelines, operators mechanically push these condensates out of the low elevations and down the pipeline by an operation called "pigging," which involves first inserting a device called a pig[310]into a pig

[310] Pigs are typically spherical, barrel- or bullet-shaped objects slightly smaller than the diameter of the pipeline.

launcher upstream of the pipeline segment where condensates have accumulated. The natural gas flowing through the pipeline then pushes the pig through the pipeline, allowing the pig to sweep along the accumulated condensates. The pig is removed from the pipeline segment when it is caught in a pig receiver. Pigging operations are also conducted using "smart" pigs that are equipped with sensors to collect data about the pipeline's structural characteristics and integrity for safety and maintenance purposes.

Before a pig can be inserted or removed through the hatch of a pig launcher or a pig receiver, the pipeline gas in the launcher or receiver barrel must be removed. It is common practice to vent the gas directly to the atmosphere where gas capture or control are not used. This gas is under the same pressure as the pipeline and contains methane, ethane, and VOCs including HAP such as benzene, toluene, ethylbenzene, and xylene. Emissions can also result from the volatilization of collected condensate liquid when the pig barrel is depressurized.

Pig launchers and receivers can be installed within larger facilities, such as at a compressor station or natural gas processing plant, or can be "stand-alone" sites, where the only equipment at a particular location is related to pigging operations. Additionally, sections of pipeline or equipment that are separate from the pig launcher or receiver may need to be evacuated of gas for reasons other than pigging, such as routine maintenance or inspection activities. Emissions from blowdowns can be calculated by accounting for the volume of the section of pipeline or equipment being evacuated, composition of that gas being vented, pressure of the gas vented, frequency of the blowdown activity, and inclusion of emissions from any volatile liquids present in the pipeline section or equipment being vented.

The EPA is aware of some State and local governments have regulations in place that

address blowdown activities, including pigging. These include limits on the amount of emissions from pigging operations, required use of add-on controls, and implementation of best management practices.[311] Estimating emissions from pigging operations is fairly straightforward if all variables (*e.g.,* volume, pressure, and composition of gas) are known. However, the wide range of variables, which are applied in different combinations and are dependent on the frequency of blowdown events, can make it challenging to estimate total nationwide emissions from pigging and related blowdown activities. For example, in 2019, six of the eight operators reporting to GHGRP subpart W in the Uinta Basin reported a collective 7,299 blowdown events due to pigging that met the threshold for reporting under GHGRP subpart W, but the attribution of emissions from each individual pigging event is undetermined at this time.[312] Data reported in 2019 under GHGRP subpart W include 472,995 total individual blowdown events from 1,212 facilities for a combined 307,630 metric tons of methane emitted, including 79,746 events at pig launchers or receivers for a combined total of 19,066 metric tons of methane, however, these data only include emissions from blowdown equipment with a unique physical volume greater than 50 cubic feet and occurring at a facility with total emissions greater than 25,000 metric tons CO_2 Eq.[313] The EPA is also aware of a single operator in the Marcellus Shale region that operates around 400 pig launchers and receivers which collectively emit approximately 1,335 metric tons of methane annually, but the total annual emissions from each launcher or receiver varies widely, due to variations in the inputs used to calculate emissions from an individual pigging

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[311] See TSD located at Docket ID No. EPA-HQ-OAR-2021-0317.
[312] EPA (2020) Greenhouse Gas Reporting Program. U.S. Environmental Protection Agency. Data reported as of September 26, 2020.
[313] Id.

event.[314]The EPA is seeking comment on the availability of nationwide data sets or methodologies to better identify the total inventory of pig launchers and receivers, and, if no such data set or proxy exists, comment on the most defensible method of calculating total emissions from pigging and related blowdown activities.

The EPA has identified the following potential control options that can reduce emissions from pipeline pig launchers and receivers: (1) Reducing the frequency that the pig launcher or receiver must be evacuated of gas; (2) eliminating or reducing the volume of gas vented during blowdowns; (3) using add-on controls that are applied to blowdown emissions; or (4) a combination of these strategies. The EPA has identified the following systems as potential control strategies to evaluate further.

First, pig ball valves are a design alternative to conventional pig launcher and receiver systems that have a smaller sized barrel (or chamber) that launches and receives the pig, thus resulting in reduced emissions from pigging operations. A conventional pig launcher or receiver system can be retrofitted by replacing the conventional launcher and receiver barrels with special ball valves used to insert and remove the pig directly from the main pipeline. By replacing the large volume barrel with the much smaller volume ball valve, the volume of gas vented during each pigging operation can be reduced by as much as 80 to 95 percent, with a corresponding reduction in emissions and other risks associated with pipeline pigging operations. The net cost of a pig ball valve compared to a traditional launcher/receiver should consider not only the cost of the valve and its installation, but also the savings realized from the prevention of large quantities of vented gas and personnel time spent blowing down a larger

[314] See Appendix A to the TSD located at Docket ID No. EPA-HQ-OAR-2021-0317.

launcher/receiver. These costs and savings will vary according to site-specific dimensions, gas composition, and pigging frequency. The EPA understands that not every dimension of pipeline and pig launcher or receiver can use a pig ball valve and seeks further comment on specific circumstances where such equipment is appropriate, potential challenges to using a pig ball valve or retrofitting a launcher or receiver to accommodate a pig ball valve, and specific costs of installing or retrofitting a launcher or receiver compared to a conventional full-barrel launcher or receiver.

Second, multi-pig launcher systems are a design alternative to conventional launcher/receiver systems and reduce pigging emissions by reducing the frequency that launchers and receivers must be opened to the atmosphere and vented prior to pig insertion and removal. The launcher barrel is designed to hold multiple spherical pigs, which are each held in place by gates or pins prior to release. Emission reductions are approximately proportional to the reduction in frequency of opening the launcher and receiver hatch. For example, if a pig launcher holds six pigs, which are loaded all at once, the frequency of venting of the pig barrel is reduced to one-sixth of what it would have been if each pig were loaded individually. The EPA understands that multi-pig launchers and receivers are most appropriate for large diameter pipelines where the footprint of the launcher or receiver site is large enough to accommodate such a system. The EPA seeks comment on specific circumstances where such equipment is appropriate, and requests information on emission reductions and specific costs and savings of installing or retrofitting and operating a multi-pig launcher or receiver compared to a conventional single-pig launcher or receiver.

Next, there are several liquids management technologies that focus on reducing emissions

from the liquid condensate that is collected during pigging operations. The first technology relates to the design of condensate drains on receiver barrels. Drains can be installed in the bottom of receiver barrels and pig ball valves to ensure that all condensate is drained from the system prior to depressurization. These drains generally route the condensate back into the main pipelines, to onsite storage tanks, or to onsite processes via enclosed piping and can be retrofitted to existing systems. Recovering condensate prevents emissions that would occur when the liquids volatilize during depressurization of the pig receiver. The EPA seeks comment on different configurations of condensate drains, how the recovered condensate is routed and managed, limitations on using this technology, and data showing the amount of condensate recovered and associated emissions prevented.

The second liquids management technology is a pig ramp on a receiver barrel. A pig ramp[315]is a simple device that can be installed inside a receiver barrel to allow liquids trapped in front of the pig to be captured and to allow liquids clinging to the pig itself to drain before the pig is pulled from the chamber. Pig ramps are typically used in conjunction with condensate drains. The pig ramp promotes the flow of liquid through the barrel and into the drain line by elevating the pig on a rack-like apparatus within the receiver barrel, thereby preventing the pig from creating blockages in the receiver. By promoting the flow of liquid to a location within the receiver or pipeline where the liquids can be captured and drained prior to depressurization, pig ramps reduce the amount of condensed VOCs that would otherwise volatilize during depressurization and removal of the pig from the receiver, thereby reducing emissions. The EPA

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315 *https://www.mplx.com/content/documents/mplx/markwest/Launcher%20Receiver%20Design%20Detail.pdf*

seeks comment on the successful installation and use of pig ramps as well as information on cost, emission reductions, and concerns or challenges that may make the use of pig ramps inappropriate.

The third liquids management technology involves enhanced liquids containment. If recovered condensate cannot be routed back to the pipeline or to controlled storage vessels, covering containers that collect liquids remaining in a receiver barrel after depressurization with a fitted impermeable material will reduce emissions from evaporation. However, whether or not this strategy will ultimately reduce emissions depends on how the recovered condensate is actually managed. The EPA seeks comment on how recovered condensate can be managed to ensure that emissions from the volatilization of the liquids is minimized, thereby achieving emissions reductions.

Lastly, the EPA has identified several additional control options that can be employed to reduce emissions. First, an owner or operator could install "jumper lines" that allow routing high pressure systems to lower pressure systems. The depressurization emissions from high pressure launchers and receivers can be reduced by routing the high-pressure gases to a lower pressure system before venting the remaining gases to the atmosphere or to control equipment. Routing to a lower pressure system is achieved with a depressurization line (or jumper line) exiting the top of the barrel, or exiting the top of the pig ball valve, and connecting to nearby low-pressure lines on site. Compressor stations and gas plants have low pressure lines on the site that typically can receive these depressurized gases and recycle them through the process. Similarly, launchers and receivers along high pressure pipelines are occasionally located near low pressure pipelines that can receive depressurized gases exiting the barrel or pig ball valve. The EPA seeks comment on

the universe of sites where jumper lines are feasible to install, as well as information on cost, emission reductions, and comment on implementation successes and challenges.

Second, owners and operators can route low-pressure systems into a fuel gas system or VRU. Gases that remain in high pressure barrels after venting to low pressure systems, and gases in low pressure barrels, can be recovered during depressurization by discharging the gases to very low-pressure systems at the site (*e.g.,* 10-15 psig). Two examples of very low-pressure systems at compressor stations are a fuel gas system and a condensate tank VRU. Applying such an approach can reduce the gas pressure in the barrels to the pressure of the very low-pressure system, with a corresponding reduction in depressurization emissions. The feasibility of this option is contingent upon the presence of such equipment already onsite. The EPA seeks comment on the universe of sites where routing gas to low-pressure systems is feasible, as well as information on cost, emission reductions, and comment on implementation successes and challenges.

Third, owners and operators can utilize barrel pump-down systems. In barrel pump-down systems, small fixed or portable compressors are used to pump vapors in the receiver or a launcher barrel back into the main pipeline prior to venting and opening the barrel hatch. In barrel pump-down systems, the inlet of a gas compressor is connected to the receiver or launcher depressurization line, and the compressor discharge is connected into the main pipeline. Vapors exiting the depressurization line are pulled into the compression system and recovered back into the pipeline at system pressure. These control systems can recover greater than 99 percent of the depressurization vapors from pig launchers and receivers. The EPA seeks comment on the universe of sites where barrel pump-down systems are feasible, as well as information on cost,

emission reductions, and comment on implementation successes and challenges.

Finally, owners and operators could route depressurization gases to combustion devices to control emissions from pigging operations. Depressurization gases from barrels and pig ball valves can be routed through the depressurization line to onsite combustion devices. Well-designed and operated combustion devices can achieve vapor destruction efficiencies as high as 95 to 98 percent. Combustion devices can be used in conjunction with engineering solutions discussed above that first reduce accumulation of or recover as much natural gas and condensate as possible, before destroying the remaining vapors in the combustion device. An example would be to route high pressure systems to low pressure lines and drain barrel condensate, then route the remaining vapors to a combustion device. The EPA understands that large, high-capacity combustion devices are typically available at compressor stations and processing plants and can be used to control pigging gases while meeting the other flaring needs of the facility. There are also numerous low-capacity combustion devices available for serving remote launcher/receiver sites. The EPA seeks comment on the universe of sites where routing depressurization gases from pigging operations to a combustion device is feasible, as well as information on cost, emission reductions, and comment on implementation successes and challenges.

In addition to those methods already identified above for reducing emissions from pigging and related blowdown activities, the EPA is seeking comment on other existing technologies and work practices to reduce the need for blowdown events or reduce emissions from blowdown events when they occur. The EPA is specifically interested in the costs of such technologies or work practices and any variables impacting cost, the control efficiency of the technology or work practice and variables affecting efficiency, and any technological or

logistical limitations to implementing the technology or work practice.

While blowdown emissions due to pigging are the primary area where the EPA seeks comment, the EPA is aware that planned blowdowns occur for many reasons, typically related to maintenance or inspection activities. Planned blowdowns may occur at facilities such as a gas processing plant, compressor station, well pad, or stand-alone pig launcher and receiver station, but may also occur at locations other than these facilities, including along pipelines. Under GHGRP subpart W, blowdown vent stack equipment or event types are grouped into the following seven categories: Facility piping (*i.e.,* piping within the facility boundary), pipeline venting (*i.e.,* physical volumes associated with pipelines vented within the facility boundary), compressors, scrubbers/strainers, pig launchers and receivers, emergency shutdowns (this category includes emergency shutdown blowdown emissions regardless of equipment type), and all other equipment with a physical volume greater than or equal to 50 cubic feet.[316] The EPA seeks comment on any substantive differences between pigging blowdowns and other types of planned blowdowns. Further, the EPA is soliciting comment on how to define an affected facility that includes these blowdown activities, and specific limitations (*e.g.,* technical or logistical) to including non-pigging-related types of blowdowns as part of affected facilities. In particular, the EPA is considering whether the pipeline itself could be defined as an affected facility for purposes of regulating blowdowns. In this scenario, the owner or operator of the pipeline would be responsible for complying with any requirements in place for blowdown activities that occur anywhere along the pipeline. The EPA is soliciting comment on any potential concerns this type of approach would raise for owners and operators, particularly where

[316] 40 CFR 98.233(i)(2)

pipelines cross State boundaries or at the location where pipeline ownership may change from the upstream owner to a different downstream owner.

C. Tank Truck Loading

The EPA is considering including emission standards and EG for tank truck loading operations; however, additional information is needed to evaluate BSER and propose NSPS or EG for this emissions source. The EPA is therefore soliciting comment on adding tank truck loading operations as an affected facility in both the NSPS and EG. Depending on the information received through the public comment process, the EPA may propose NSPS and EG for this source through a supplemental proposal. In this section we summarize the available information we have reviewed for this emissions source and potential control options.

Tank truck loading operations result in emissions when organic vapors in empty tank trucks are displaced to the atmosphere as crude oil, condensate, intermediate hydrocarbon liquids, or produced water from storage vessels is loaded into the tank trucks.[317] Tank truck loading emissions are the primary source of evaporative emissions from tank trucks. It is the EPA's understanding that these vapors are a composite of vapors formed in the empty tank truck by evaporation of residual materials from previous loads, vapors transferred to the tank truck in vapor balance systems as materials are being unloaded, and vapors generated in the tank truck as new material is being loaded. Further, the quantity of evaporative losses from loading operations is, therefore, a function of the parameters such as the physical and chemical characteristics of the crude oil, condensate, intermediate hydrocarbon liquids, or produced water; the method of

[317] Section 5.2.2.1.1 of the AP-42 Section 5.2: Transportation and Marketing of Petroleum Liquids *https://www.epa.gov/sites/default/files/2020-09/documents/5.2_transportation_and_marketing_of_petroleum_liquids.pdf.*

unloading the crude oil, condensate, intermediate hydrocarbon liquids, or produced water from the storage vessel into the tank truck; and the operations to transport the empty tank truck off-site. The composition of evaporative losses includes VOC, methane, and some HAP.

According to the 2017 NEI, VOC emissions from tank truck loading operations were approximately 72,448 tpy, of which over 70,990 tpy were emitted in the crude oil and natural gas production segment, with the balance of approximately 1,457 tpy emitted from the natural gas processing segment. According to the Oklahoma loading losses guidance, [318] a loading loss vapor VOC content of 85 percent by weight (*i.e.*, 15 percent by weight methane and ethane) may be assumed at wellhead facilities. Condensate and crude oil being loaded at a facility other than a wellhead facility may assume a vapor VOC content of 100 percent. Applying these compositions to the emissions in the 2017 NEI results in approximately 12,528 tpy methane at well sites and 1,457 tpy methane from other segments.

According to EIA, the contiguous continental states area comprising of 48 States have a six year daily average condensate production (API gravity greater than or equal to 50) [319] of 911,000 bbls/day.[320] Emissions per barrel of liquids loaded into tank trucks may be estimated at 0.43lb VOC/bbl. It is the EPA's understanding that most sites use tank trucks with a capacity of approximately 130 bbl. The EPA solicits comment on whether API gravity greater than or equal to 50 is the appropriate gravity of condensate to use.

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[318] See *https://www.deq.ok.gov/wp-content/uploads/deqmainresources/LoadingLossesGuidance_08-2019.pdf*
[319] See https://glossary.oilfield.slb.com/en/terms/c/condensate
[320] See *http://www.eia.gov/dnav/pet/pet_crd_api_adc_mbblpd_m.htm* and TSD located at Docket ID No. EPA-OAR-HQ-2021-0317.

The EPA understands that there are three options generally in use for controlling emissions during the tank truck loading process. The first control option is vapor balancing which is used to route the vapors displaced during material loading from the tank truck back to the storage vessel. Vapor balancing requires a vapor capture line to connect the tank truck to the storage vessel or manifold system of a tank battery. Because vapor balancing is a closed system, the only anticipated emissions from this control option would be fugitive in nature. However, emissions may occur from the tank truck if it is not properly maintained to DOT specifications, or when the tank truck is cleaned or reloaded without control off-site. Vapor balancing does not have any secondary air impacts or energy requirements. We estimate the capital cost associated with a vapor balancing loading arm (equipment associated with a capture line to connect the tank truck to the storage vessel) at about $5000 per arm based on limited available information.

The second control option is use of a closed vent system operating with a reduction efficiency of 95 to 99 percent. A vapor capture system is used and routed to a vapor recovery device (VRD) or VRU which uses refrigeration, absorption, adsorption, and/or compression. The recovered liquid product is piped back to storage. Alternatively, the vapors may be collected via a vapor capture system and routed to an on-site thermal oxidizer or flare. It is possible to route emissions from this closed vent system to an existing control device located on-site for another purpose. The EPA recognizes that this option may have secondary impacts dependent on the type of control chosen (*e.g.*, VRU, VRD, or combustion device).

Finally, the third option is to directly pipe liquids downstream. By directly piping liquids downstream, no emissions from tank truck loading are released to the atmosphere. We are not aware of any secondary impacts or energy costs associated with this option. However, the EPA is

also unsure if this option is technically feasible for every site. It is our understanding that this option requires access to pipelines that can transport the crude oil and/or condensate to downstream locations, and availability of pipelines or capacity to move these liquids in existing pipelines may present an issue with requiring this option for all sites.

In addition to these three control options, the EPA has also identified work practices related to the method of loading which are important and play a role in minimizing air emissions. Practices such as submerged fill and bottom loading help reduce emissions when the fill pipe opening is below the liquid surface level which reduces liquid turbulence and results in much lower vapor generation than encountered during splash (top) loading. We estimate the capital costs of submerged fill loading arms are approximately $1,500 per arm based on limited available data at this time.

The EPA is soliciting comment on the three control options and work practices presented in this section to control or reduce emissions resulting from the tank truck loading process. We solicit comment on other control options or other work practice standards similar to those used in other sectors such as petroleum refineries and how appropriate those options may be for the Crude Oil and Natural Gas source category. We solicit comment on how widely used the control measure and work practices are, any feasibility challenges, and estimates of baseline emissions and cost information associated with these control options and work practices. The EPA is aware of several State regulations that have established standards for this emissions source.[321] Finally, the EPA solicits comment on any practices owners and operators already implement as part of voluntary efforts or State requirements to minimize emissions from these sources.

[321] See TSD located at Docket ID No. EPA-OAR-HQ-2021-0317.

D. Control Device Efficiency and Operation

As discussed above in sections XI.B, F, and G and XII.B, F, and G, the EPA is proposing to retain the 95 percent reduction performance standard for storage vessels, wet seal centrifugal compressors, and pneumatic pumps based on our analysis showing that a combustion control device remains the BSER for these affected facilities and can reliably achieve this performance standard. This 95 percent reduction is generally achieved by capturing the emissions in a closed vent system that routes those emission to either a control device or back to the process. Under the 2016 NSPS OOOOa, as amended by the 2020 Technical Rule with further amendments proposed in this action, closed vent systems must be designed and operated with no detectable emissions, which is defined as either no emissions detected greater than 500 ppm above background with EPA Method 21, no emissions detected with OGI, or no audible, visual, or olfactory emissions detected. Thus, for a closed vent system, the assumed control efficiency is 100 percent. Therefore, any control device used must be designed and operated to achieve at least 95 percent reduction of emissions to comply with the standard. Examples of control devices include flares, thermal oxidizers, catalytic oxidizers, enclosed combustion devices, carbon adsorption systems, condensers, and VRUs. However, there are various data sources available that suggest combustion control devices, which we have again identified as the BSER for these affected facilities, can achieve a continuous destruction efficiency of 98 percent.[322]

Therefore, the EPA is soliciting comment on potentially proposing a change in the

[322] *Oil and Natural Gas Sector: Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution. Background Supplemental Technical Support Document for the Final New Source Performance Standards*; EPA-HQ-OAR-2010-0505-7631, pp. 19-20.

standards for wet seal centrifugal compressors, storage vessels, and pneumatic pumps that would require 98 percent reduction of methane and VOC emissions from these affected facilities. It is the EPA's understanding that combustion control devices, such as flares and enclosed combustion devices, may achieve at least 98 percent control of all organic compounds. Further, as noted in AP-42 Chapter 13.5, properly operated flares achieve at least 98 percent destruction efficiency in the flare plume in normal operating conditions.[323] However, the EPA has received some data[324] relevant to the use of these controls at oil and gas facilities that indicates air-assisted and steam-assisted flares have been found operating outside of the conditions necessary to achieve at least 98 percent control efficiency on a continuous basis. Therefore, the EPA is soliciting comment and information that would help us better understand the cost, feasibility, and emission reduction benefits associated with establishing a 98 percent control efficiency requirement for flares in the Crude Oil and Natural Gas source category, including information on the level of performance being achieved in practice by flares in the field, what conditions or factors contribute to malfunctions or poor performance at these flares, and what measures the EPA could or should require in order to ensure that flares perform at a 98 percent level of control.

The EPA also requests comment on whether additional measures to ensure proper performance of flares would be appropriate to ensure that flares meet the current 95 percent

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[323] https://www.epa.gov/sites/default/files/2020-10/documents/13.5_industrial_flares.pdf
[324] "*Intermittency of Large Methane Emitters in the Permian Basin*" Daniel H. Cusworth, et al. Environmental Science & Technology Letters 2021 8 (7), 567-573 DOI: 10.1021/acs.estlett.1c00173; and Irakulis-Loitxate, I., Guanter, L., Liu, Y. N., Varon, D. J., Maasakkers, J. D., Zhang, Y., Lyon, D., ... & Jacob, D. J. (2021). Satellite-based characterization of methane point sources in the Permian Basin (No. EGU21-15877). Copernicus Meetings.

control requirement. For example, the EPA is soliciting comment on the specific requirements that could be used to demonstrate continuous compliance when using a combustion control device. In its July 8, 2021, report, the Office of Inspector General (OIG)[325] observed that State permitting authorities had difficulty verifying continuous compliance with combustion efficiency requirements for flares and enclosed combustors. The OIG recommended that the EPA explore additional means to verify continuous compliance in NSPS OOOO and NSPS OOOOa that would provide additional tools for State agencies to properly permit and enforce combustion efficiency. In considering this recommendation, the EPA has determined that additional information is necessary to support the development of cost-effective continuous compliance requirements.

The current standards in NSPS OOOO and NSPS OOOOa require owners and operators to perform an initial demonstration of compliance for all control devices used to meet the standards in the rule. Further, NSPS OOOO and NSPS OOOOa require monthly EPA Method 22 observations to demonstrate continuous compliance with visible emission requirements, in addition to monitoring for the presence of a pilot light. When an enclosed combustion device is used, owners and operators may demonstrate initial compliance through field testing or through manufacturer testing. The EPA maintains a list of devices for which manufacturers have demonstrated compliance with the testing requirements, including achieving a destruction efficiency of at least 95 percent. The devices that have demonstrated compliance through manufacturer testing have achieved greater than 98 percent destruction efficiency; however, this

[325] EPA Office of Inspector General Report "*EPA Should Conduct More Oversight of Synthetic-Minor-Source Permitting to Assure Permits Adhere to EPA Guidance*," Report No. 21-P-0175 July 8, 2021

is demonstrated in a testing environment only, and while the testing is designed to challenge the units, the units may not necessarily demonstrate the same destruction efficiency in field applications. The EPA is seeking comment on alternative means to demonstrate continuous compliance with the required control efficiency (whether maintained at 95 percent or increased to 98 percent).

The Petroleum Refinery Sector Standards, 40 CFR part 63, subpart CC, were amended in 2015 (80 FR 75178) to include a series of additional monitoring requirements that ensure flares achieve the required 98 percent control of organic compounds. Previously these flares had been subject to the flare requirements at 40 CFR 60.18 in the part 60 General Provisions. More recently, the updated flare requirements in NESHAP subpart CC have been applied to other source categories in the petrochemical industry, such as ethylene production facilities (40 CFR part 63, subpart YY), to ensure that flares in that source category also achieve the required 98 percent control of organic compounds. These monitoring requirements include continuous monitoring of waste gas flow, composition and/or net heating value of the vent gases being combusted in the flare, assist gas flow, and supplemental gas flow. The data from these monitored parameters are used to ensure the net heat value in the combustion zone is sufficient to achieve good combustion. The monitoring also includes prescriptive requirements for monitoring pilot flames, visible emissions, and maximum permitted velocity. Lastly, where fairly uniform, consistent waste gas compositions are sent to a flare, owners or operators can simplify the monitoring by taking grab samples in lieu of continuously monitoring waste gas composition, and in some instances, engineering calculations can be used to determine flow measurements.

While effective, the EPA seeks comment on how appropriate any such monitoring

requirements and systems would be for the oil and gas production, gathering and boosting, gas processing, or transmission and storage segments subject to the proposed NSPS OOOOb and EG OOOOc. The EPA seeks comment on how to distinguish among flare units where such monitoring is practical, and alternatives where such systems are not practical because they lack continuous, on-site personnel or do not have the supporting infrastructure.

Additionally, the EPA seeks comment on several facets of ongoing compliance, including: (1) Owner or operator experience in determining the proper location of a thermocouple for monitoring the presence of a pilot flame, and how to avoid pilot flame failure; (2) how OGI may be used to identify poor combustion efficiency (*e.g.,* to effectively utilize OGI to qualitatively screen enclosed combustion devices) for additional quantitative testing. As noted in Section XI.A.1 of this preamble, we are proposing that emissions resulting from control devices operating in a manner that is not in full compliance with any Federal rule, State rule, or permit, are also considered fugitive emissions. However, there may be other ways to use OGI beyond seeing these fugitive emissions to determine whether control devices are operating properly. For instance, the EPA is interested in how OGI has been used to evaluate heat signature of gases exiting the top of the stack and/or the presence of any unburned hydrocarbon trailing or advective plumes.

With respect to enclosed combustors, the EPA is seeking information on the development of comprehensive specifications for creating an operating envelope under which a make/model can achieve 98 percent reduction (*i.e.,* parameters that should be identified on enclosed combustion device specification sheets), such as maximum heat load, minimum heat load, minimum inlet pressure of waste gas stream, temperature of combustion zone (and proper

location for temperature monitor), air intake rate, operation and maintenance necessary for optimal combustion. The EPA also seeks information on real-time monitoring of enclosed combustion device inlet waste gas stream pressure aimed at achieving higher combustion efficiency.

The EPA is also soliciting comment on the current use of non-combustion control devices, the practicality of requiring 98 percent reduction through the use of non-combustion control devices, and the monitoring requirements necessary to demonstrate initial and continuous compliance with such control efficiency. NSPS OOOO and NSPS OOOOa require parametric monitoring for condensers, carbon adsorption systems, and similar control devices, to demonstrate continuous compliance. However, the EPA is seeking comment on whether those monitoring requirements are sufficient to assure continuous compliance should the EPA propose a requirement of 98 percent reduction. In addition to monitoring requirements, the EPA is seeking information on what additional records should be maintained and/or reported for demonstrating continuous compliance when non-combustion control devices are used. The EPA is particularly concerned that increasing the level of control from 95 to 98 percent would disincentivize use or potentially force replacement of non-combustion control devices entirely, including those that capture product for reuse in vapor recovery systems. For example, Texas requires additional monitoring and other significant engineering upgrades for a VRU operator to meet a higher control efficiency than 95 percent.[326] Adding to this concern is the potential

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326 See *Vapor Recovery Unit Capture/Control Guidance* located at *https://www.tceq.texas.gov/assets/public/permitting/air/NewSourceReview/oilgas/vapor-rec-unit.pdf*.

increase in overall costs of the rule and potential increase in emissions where facilities replace non-combustion control devices with combustion control devices.

Finally, the EPA is seeking comment on new technologies that would address control efficiency from flares specifically and provide real-time or near real-time measurement of control efficiency. One example would be OGI continuous flame imaging systems that capture flame size and temperature to ensure these parameters are within acceptable ranges. New optical technology is in the early phases of development and deployment. The EPA acknowledges that it may be challenging to analyze costs and reductions without comprehensive data specific to a particular technology, but in the interest of a forward-looking standard, we seek information on potential methods to assure continuous compliance for these control devices.

E. Definition of Hydraulic Fracturing

During pre-proposal outreach, a number of small businesses stated that the NSPS has unintentionally been applied to conventional and vertical wells that engage in hydraulic fracturing. The small business stakeholders contended that these wells have a very different profile from unconventional or horizontal wells in terms of footprint, water usage, chemical usage, equipment used, and flowback period. They recommended that the EPA explicitly exempt these wells from the proposal. We maintain that the original intent of the NSPS was to regulate hydraulically fractured wells, in both conventional and unconventional reservoirs[327], and both vertical and horizontal wells.[328]

NSPS OOOOa defines hydraulic fracturing as "the process of directing pressurized fluids

[327] See Docket ID Item Nos. EPA-HQ-OAR-2010-0505-0445, Chapter 4, p.4-2 and EPA-HQ-OAR-2010-0505-4546, p. 30.
[328] See Docket ID Item No. EPA-HQ-OAR-2010-0505-4546, p. 61.

containing any combination of water, proppant, and any added chemicals to penetrate tight formations, such as shale or coal formations, that subsequently require high rate, extended flowback to expel fracture fluids and solids during completions." The NSPS does not offer numeric thresholds that define "tight formations" or "high rate, extended flowback". When developing the original NSPS OOOO, EPA's analysis assumed hydraulic fracturing is performed in tight sand, shale, and coalbed methane formations which have an in situ permeability (flow rate capability) to gas of less than 0.1 millidarcy.[329] The EPA also assumed the flowback lasted between 3 and 10 days for the average gas well[330], and 3 days for the average oil well.[331] However, in response to a public comment on the 2015 NSPS OOOOa proposal claiming the definition of hydraulic fracturing was too broad, the EPA clarified it intended to "include operations that would increase the flow of hydrocarbons to the wellhead".[332] Similarly, in response to a public comment seeking an exemption for wells that have a flowback period of less than 24 hours, the EPA acknowledged that there is a range of flowback periods, finding that the requested exemption was not warranted.[333]

We are soliciting comment on if numeric thresholds for "tight formations" or "high rate, extended flowback" are appropriate to include in the definition of hydraulic fracturing, and if so, what those numeric thresholds should be. Alternatively, we solicit comment on if it is appropriate to align the NSPS definition with the U.S. Geologic Survey (USGS) definition of

[329] See Docket ID Item No. EPA-HQ-OAR-2010-0505-0445, Chapter 4, p.4-2.
[330] See Docket ID Item No. EPA-HQ-OAR-2010-0505-0445, Chapter 4, p.4-1.
[331] See Docket ID Item No. EPA-HQ-OAR-2010-0505-5021, p.20.
[332] See Docket ID Item No. EPA-HQ-OAR-2010-0505-7632, Chapter 3, p.3-113.
[333] See Docket ID Item No. EPA-HQ-OAR-2010-0505-7632, Chapter 3, p.3-64.

hydraulic fracturing ("the process of injecting water, sand, and/or chemicals into a well to break up underground bedrock to free up oil or gas reserves")[334], which may more accurately capture the EPA's original intent.

XIV. State, Tribal, and Federal Plan Development for Existing Sources

Over the last forty years, under CAA section 111(d), the agency has regulated four pollutants from five source categories (*i.e.*, sulfuric acid plants (acid mist), phosphate fertilizer plants (fluorides), primary aluminum plants (fluorides), kraft pulp plants (total reduced sulfur), and municipal solid waste landfills (landfill gases)).[335] In addition, the agency has regulated additional pollutants under CAA section 111(d) in conjunction with CAA section 129.[336] The Agency has not previously addressed emissions of GHGs (in the form of limitations of methane)

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[334] USGS. Hydraulic Fracturing. *https://www.usgs.gov/mission-areas/water-resources/science/hydraulic-fracturing?qt-science_center_objects=0#qt-science_center_objects*. Accessed September 1, 2021.

[335] See *''Phosphate Fertilizer Plants; Final Guideline Document Availability,''* 42 FR 12022 (March 1, 1977); *''Standards of Performance for New Stationary Sources; Emission Guideline for Sulfuric Acid Mist,''* 42 FR 55,796 (October 18, 1977); *''Kraft Pulp Mills, Notice of Availability of Final Guideline Document,''* 44 FR 29828 (May 22, 1979); *''Primary Aluminum Plants; Availability of Final Guideline Document,''* 45 FR 26,294 (April 17, 1980); "*EG and Compliance Times for Municipal Solid Waste Landfills*," 81 FR 59276 (August 29, 2016). In addition, EPA regulated mercury from coal-fired electric power plants in a 2005 rule that was vacated by the D.C. Circuit, *"Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units; Final Rule,"* 70 FR 28,606 (May 18, 2005) (Clean Air Mercury Rule), vacated by *New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir. 2008). EPA also regulated GHG from fossil fuel-fired electric power plants in a 2015 rule that EPA subsequently repealed and replaced with a 2019 rule that, in turn, was vacated by the D.C. Circuit. *"Carbon Pollution EG for Existing Stationary Sources: Electric Utility Generating Units; Final Rule,"* 80 FR 64,662 (Oct. 23, 2015) (Clean Power Plan), repealed and replaced by *"Repeal of the Clean Power Plan; EG for Greenhouse Gas Emissions From Existing Electric Utility Generating Units; Revisions to EG Implementing Regulations,"* (July 8, 2019) (Affordable Clean Energy Rule), vacated by *Am. Lung Assoc.*

[336] See, *e.g.*, *''Standards of Performance for New Stationary Sources and EG for Existing Sources: Sewage Sludge Incineration Units, Final Rule,''* 76 FR 15372 (March 21, 2011).

from the Crude Oil and Natural Gas source category under CAA section 111(d). However, the EPA has ample experience with this source category from implementing the NSPS for so long, and has examined existing sources in a variety of context including the 2013 Federal Implementation Plan (FIP) for oil and natural gas well production facilities on the Fort Berthold Indian Reservation (78 FR 17836 (Mar. 22, 2013)), the 2016 Oil and Natural Gas Control Techniques Guidelines (81 FR 74798 (Oct. 27, 2016)), and the 2020 proposed FIP for managing emissions from oil and natural gas sources on Indian country lands within the Uintah and Ouray Indian Reservation (85 FR 3492 (Jan. 21, 2020)). The draft EG contained in this proposal draw from, among other sources of information and analysis, all of these experiences combined with information on State laws that regulate existing sources. In this action, the EPA is proposing EG for Sates to follow in developing their plans to reduce emissions of GHGs (in the form of limitations on methane) from designated facilities within the Crude Oil and Natural Gas source category.

A. Overview

While section IV of this preamble provides a general overview of the State planning process triggered by the EPA's finalization of EG under CAA section 111(d), this section explains the EG process and proposed State plan requirements in more detail, and also solicits comment on various issues related to this EG. The EG process is governed by CAA section 111(d) as well as the final EG and the EPA's implementing regulations at 40 CFR Part 60 Subpart Ba.[337] After the EPA establishes the BSER in the final EG, as described in preamble

[337] As previously noted, the D.C. Circuit has vacated certain timing provisions within Subpart Ba. *Am. Lung Assoc. v. EPA*. However, the court did not vacate the applicability provision, and therefore Subpart Ba applies to any EG that EPA finalizes from this proposal.

sections XI and XII, each State that includes a designated facility must develop, adopt, and submit to the EPA its State plan under CAA section 111(d). The EPA then must determine whether to approve or disapprove the plan. If a State does not submit a plan, or if the EPA does not approve a State's plan, then the EPA must establish a Federal plan for the State.

Each of these steps, and more, is discussed in detail in this section which is organized into six parts. First, we discuss the components of the EG. Second, we discuss establishing standards of performance in State plans in response to a finalized EG. Third, we discuss the components of an approvable State plan submission. Fourth, we discuss the timing for State plan submissions and compliance times. Fifth, we discuss the EPA's action on State plans and promulgation of a Federal plan, if needed. Sixth, we discuss the CAA section 111(d) process as it relates to Tribes. While this section describes the requirements of the implementing regulations under 40 CFR 60 subpart Ba, proposes requirements for States in the context of this EG, and solicits comments in the context of this EG, nothing in this proposal is intended to reopen the implementing regulations themselves for comment.

B. Components of EG

As previously described, CAA sections 111(d)(1) and 111(a)(1) collectively establish and define certain roles and responsibilities for the EPA and the States. The EPA addresses its responsibilities by drafting and publishing EG in accordance with 40 CFR 60.22a, which "[contain] information pertinent to control of the designated pollutant from designated facilities." Mirroring language included in CAA section 111(d)(1), the EPA's implementing regulations define a designated pollutant as "any air pollutant, the emissions of which are subject to a standard of performance for new stationary sources, but for which air quality criteria have not

been issued and that is not included on a list published under section 108(a) or section 112(b)(1)(A) of the Act." 40 CFR 60.21a(a). The EPA's implementing regulations also define a designated facility as "any existing facility (see 40 CFR 60.2) which emits a designated pollutant and which would be subject to a standard of performance for that pollutant if the existing facility were an affected facility (see section 60.2)." *Id.* at 60.21a(b). The designated pollutant for purposes of the draft EG included in this proposal is GHGs, but the presumptive standards in the EG are expressed in terms of limitations on methane. A description of each of the designated facilities included in the draft EG can be found above in preamble sections XI and XII.

More specifically, 40 CFR 60.22a(b) lists six components to be included in EG to provide information for development of the State plans triggered by the promulgation of the EG. First, EG must include information regarding the "endangerment of public health or welfare caused, or contributed to, by the designated pollutant." 40 CFR 60.22a(b)(1). Information on the harmful public health and welfare impacts of methane emissions from the oil and natural gas industry are included above in section III of this document. Second, the EG must include a "description of systems of emission reduction which, in the judgment of the Administrator, have been adequately demonstrated." 40 CFR 60.22a(b)(2). The EPA has included such a description above in sections XI and XII of this preamble, and the NSPS OOOOb and EG TSD located at Docket ID No. EPA-HQ-OAR-2021-0317. Third, the EG must include information regarding "the degree of emission limitation" achievable through application of each system, along with information "on the costs, non-air quality health environmental effects, and energy requirements of applying each system to designated facilities." 40 CFR 60.22a(b)(3). The EPA has included

such a description in sections XI and XII of this preamble, and the NSPS OOOOb and EG TSD located at Docket ID No. EPA-HQ-OAR-2021-0317. Fourth, the EG must include information regarding the amount of time that the EPA believes would be normally necessary for designated facilities to design, install, and startup the control systems identified in component number three. See 40 CFR 60.22a(b)(4). The EPA explains how it proposes to address this component below in section XIV.E. Fifth, and likely most helpful to States when developing their plans in response to the final EG, the EG must include information regarding the "degree of emission limitation achievable through the application of the best system of emission reduction" that has been adequately demonstrated, taking into account the same factors as described in component three (cost, non-air quality health and environmental impact and energy requirements), "and the time within which compliance with standards of performance can be achieved." 40 CFR 60.22a(b)(5). The EPA has included such information in sections XI and XII of this preamble and the NSPS OOOOb and EG TSD located at Docket ID No. EPA-HQ-OAR-2021-0317 as well as in section XIV.E of this preamble. In identifying the degree of achievable emission limitation, the EPA may subcategorize, that is to "specify different degrees of emission limitation or compliance times or both for different sizes, types, and classes of designated facilities when costs of control, physical limitations, geographical location, or similar factors make subcategorization appropriate." *Id.* The EPA can choose to exercise that discretion to subcategorize within the draft EG for certain emission points. Sixth, and last, the EG is to include any other information not contemplated by the five other components that the EPA "determines may contribute to the formulation of State plans." This section includes such information and guidance specifically designed to assist States in developing their plans under CAA 111(d) for these draft EG.

C. Establishing Standards of Performance in State Plans

While the EPA has the authority and responsibility to determine the BSER and the degree of limitation achievable through application of the BSER, CAA section 111(d)(1) provides that States shall submit to the EPA plans that establish standards of performance for designated facilities (*i.e.*, existing sources) and provide for implementation and enforcement of such standards. In light of the statutory text, and as reflected in the technical completeness criteria in the EPA's implementing regulations (explained below), State plans implementing the EG should include requirements and detailed information related to two key aspects of implementation: establishing standards of performance for designated facilities and providing measures that implement and enforce such standards.

Establish Standards of Performance for Designated Facilities. As an initial matter, a State must identify existing facilities within its borders that meet the applicability requirements in the final EG and are thereby considered a "designated facility" under the EG.[338] Then, States are required to establish standards of performance for the identified designated facilities. There is a fundamental requirement under CAA section 111(d) that a State's standards of performance reflect the degree of emission limitation achievable through the application of the BSER, which derives from the definition of "standard of performance" in CAA section 111(a)(1). The statute further requires the EPA to permit States, in applying a standard of performance, to consider a source's remaining useful life and other factors. Accordingly, based on both the mandatory and

[338] In accordance with 40 CFR 60.23a(b), states without any designated facilities are directed to submit to the Administrator a letter of negative declaration certifying that there are no designated facilities, as defined by EPA's emissions guidelines, located within the state. No plan is required for states that do not have any designated facilities.

discretionary aspects of CAA section 111(d), a certain level of process is required of State plans: namely, the standards of performance must reflect the degree of emission limitation achievable through application of the BSER, and if the State chooses, the consideration of remaining useful life and other factors in applying a standard of performance to a designated facility.

For this EG the EPA is proposing to translate the degree of emission limitation achievable through application of the BSER (*i.e.,* level of stringency) into presumptive standards of performance that States may use in the development of State plans for specific emission points. The EPA believes that the presumptive standards of performance included in the EG will provide States with the level of stringency that the EPA would require to approve a State plan. Put another way, the EPA is choosing to format this EG such that if a State chooses to adopt the presumptive standards as the standards of performance in their State plan, then the EPA believes that such plan could be approved as meeting the requirements of CAA section 111(d) and the finalized EG, assuming the plan meets all other applicable requirements. In this way, the presumptive standards included in the EG serve a similar purpose as a model rule because they are intended to assist States in developing their plan submissions by providing the States with a starting point for their standards that are based on general industry parameters and assumptions. The EPA believes that providing these presumptive standards of performance will create a streamlined approach for States in developing plans and for the EPA in evaluating State plans. Of course, the EPA cannot pre-determine the outcome of a future rulemaking process, and inclusion of these presumptive standards in this EG does not impact the rulemaking process associated with the EPA's review of, and action on, a State plan submission. In its review of State plans, the EPA will consider the information in the final EG (including what EPA publishes

in the final EG as the presumptive standards), as well as information submitted by the State and the public. The EPA will evaluate the approvability of all plans through individual notice-and-comment rulemaking processes.

As described in sections XI and XII, the EPA is proposing to translate the degree of emission limitation achievable through application of the BSER into presumptive standards for the following designated facilities as shown in Table 20.

TABLE 20: SUMMARY OF PROPOSED EG SUBPART OOOOc PRESUMPTIVE NUMERICAL STANDARDS

Designated Facility	Proposed Presumptive Mass-Based Standards in the Draft Emissions Guidelines for GHGs
Storage Vessels: Tank Battery with PTE of 20 tpy or More of Methane	95 percent control
Pneumatic Controllers: Natural Gas Driven that Vent to the Atmosphere.	VOC and methane emission rate of zero.
Wet Seal Centrifugal Compressors	95 percent control
Pneumatic Pumps: Natural Gas Processing Plants	Zero natural gas emissions from diaphragm and piston pneumatic pumps.
Pneumatic Pumps: Locations Other Than Natural Gas Processing Plants	95 percent control of diaphragm pneumatic pumps if there is an existing control or process on site. 95 percent control not required if (1) routed to an existing control that achieves less than 95 percent or (2) it is technically infeasible to route to the existing control device or process
Associated Gas from Oil Wells	Route associated gas to a sales line. In the event that access to a sales line is not available, the gas can be used as an onsite fuel source, used for another useful purpose that a purchased fuel or raw material would serve, or routed to a flare or other control device that achieves at least 95 percent control.

For these designated facilities, State plans would generally be expected to establish standards of performance that reflect these numerical presumptive standards, if included in the final EG. Further, for these designated facilities, the EPA is proposing to require that the

standards of performance be expressed in the same form as the numerical presumptive standards set forth in Table 20. For example, for storage vessels that are part of a tank battery with a PTE of 20 tpy or more of methane, the EPA is proposing a numerical presumptive standard of 95-percent control. Accordingly, if finalized as proposed, States would be required to submit a plan that includes numerical standards of performance for these designated facilities expressed in the same form as the presumptive standard of 95 percent control. As described in this proposal and the associated supporting materials in the docket, the EPA has extensively and rigorously performed technical analyses in order to determine the appropriate proposed BSER for each set of designated facilities. The form of the numerical expression of the degrees of emission limitation achievable through application of the BSERs, and the associated presumptive standards, are a result of these technical analyses. The EPA believes that requiring States to maintain the same form of numerical standard in their plans will preserve the integrity of the BSERs and avoid analytic issues that are likely to arise if EPA is required to determine whether a different form of numerical standard submitted by a State has the same level of stringency as the final EG. Accordingly, having a uniform form of standard of performance will help streamline the States' development of their plans, as well as the EPA's review of those plans, since there will be fewer variables to evaluate in the development and review of each standard of performance. The EPA solicits comment on its proposal to require State plans to include numerical standards of performance for these designated facilities that are in the same form as the numerical presumptive standards, and whether EPA should additionally allow States to include a different form of numerical standards for these facilities so long as States demonstrate the equivalency of such standards to the level of stringency required under the final EG.

For the following designated facilities, the EPA is proposing to translate the degree of emission limitation achievable through application of the BSER into the presumptive standards shown in Table 21.

TABLE 21: SUMMARY OF PROPOSED EG SUBPART OOOOc PRESUMPTIVE NON-NUMERICAL STANDARDS

Designated Facility	Proposed Presumptive Non-Numerical Standards in the Draft Emissions Guidelines for GHGs
Fugitive Emissions: Well Sites >0 to <3 tpy methane	Perform fugitive emissions survey and repair to demonstrate actual site emissions are reflected in calculation.
Fugitive Emissions: Well Sites ≥3 tpy methane	Quarterly OGI monitoring following Appendix K. (Optional quarterly EPA Method 21 monitoring with 500 ppm defined as a leak). First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.
(Co-proposal) Fugitive Emissions: Well Sites ≥3 to <8 tpy methane	Semiannual OGI monitoring following Appendix K. (Optional semiannual EPA Method 21 monitoring with 500 ppm defined as a leak). First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.
(Co-proposal) Fugitive Emissions: Well Sites ≥8 tpy methane	Quarterly OGI monitoring following Appendix K. (Optional quarterly EPA Method 21 monitoring with 500 ppm defined as a leak). First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.
Fugitive Emissions: Compressor Stations	Quarterly OGI monitoring following Appendix K. (Optional quarterly EPA Method 21 monitoring with 500 ppm defined as a leak). First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.
Fugitive Emissions: Well Sites and Compressor Stations on	Annual OGI monitoring following Appendix K. (Optional annual EPA Method 21 monitoring with 500 ppm defined as a leak). First attempt at repair within 30 days of finding fugitive emissions. Final repair within 30 days of first attempt.

Alaska North Slope.	
Fugitive Emissions: Well Sites and Compressor Stations.	(Optional) Alternative bimonthly screening with advanced measurement technology and annual OGI monitoring following Appendix K.
Pneumatic Controllers: Alaska (at sites where onsite power is not available - continuous bleed natural gas driven)	Natural gas bleed rate no greater than 6 scfh.
Pneumatic Controllers: Alaska (at sites where onsite power is not available - intermittent natural gas driven)	Monitor and repair through fugitives program.
Reciprocating Compressors	Replace the reciprocating compressor rod packing based on annual monitoring (when measured leak rate exceeds 2 scfm) or route emissions to a process.
Equipment Leaks at Gas Plants	Bimonthly OGI LDAR program (NSPS VVa as optional alternative).

The EPA's implementing regulations at 40 CFR 60.24a(b) require that standards of performance shall either be based on allowable rate or limit of emissions, except when the EPA identifies cases in an EG where it would not be feasible to prescribe or enforce a rate or limit. Put another way, 40 CFR 60.24a(b) permits the EPA to identify cases where it is not feasible for States to prescribe or enforce a numerical standard, and in those cases the EPA can include non-numerical emissions limitations such as design, equipment, work practice, or operational

standards, or a combination thereof, in the EG. See also definition of "standard of performance" in 40 CFR 60.21a(f). This authority in the context of the EG is akin to the EPA's authority under CAA section 111(h) to prescribe non-numerical standards where the Administrator determines it is not feasible to prescribe or enforce a numerical standard of performance. Where the EPA finalizes EG that authorize design, equipment, work practice, or operational standard, or a combination thereof, the State "plan shall, to the degree possible, set forth the emission reductions achievable by implementation of such standards, and may permit compliance by the use of equipment determined by the State to be equivalent to that prescribed" by the State plan. See 40 CFR 60.24a(b).

For the designated facilities listed in Table 21 the EPA has determined that it is not feasible to prescribe or enforce a numerical standard. As such, for these designated facilities, the EPA is proposing presumptive standards that are comprised of design, equipment, work practice, and/or operational standards. For these designated facilities, States are generally expected to establish the same non-numerical presumptive standards in Table 21. If States do not incorporate the presumptive standards included in the final EG into their State plan, but instead wish to utilize a different design, equipment, work practice, and/or operational standard for any of the designated facilities listed in Table 21, then the EPA is proposing to require that the State include in its plan a demonstration of how that standard will achieve a reduction in methane emissions at least equivalent to the reduction in methane emissions achieved by application of the presumptive standards included in the final EG. Such a demonstration should take into account, among other factors, the timelines for compliance. The EPA believes that this requirement is consistent with the AMEL provision in CAA section 111(h)(3), which requires a demonstration

that any alternative "will achieve a reduction in emissions . . . at least equivalent to the reduction in emissions" achieved by EPA's standard, and the technical completeness criteria found at 40 CFR 60.27a(g)(3)(iv), which requires that State plans must include a "demonstration that the State plan submittal is projected to achieve emissions performance under the applicable EG."

To the extent that a State determines the presumptive standards in the final EG are not reasonable for a particular designated facility due to remaining useful life and other factors, the statute requires that the EPA's regulations under CAA section 111(d) permit States to consider such factors in applying a standard of performance. As such, the EPA's implementing regulations at 40 CFR 60.24a(e) allow States to consider remaining useful life and other factors to apply a less stringent standard of performance to a designated facility or class of facilities if one or more demonstrations are made. These demonstrations include unreasonable cost of control resulting from plant age, location, or basic process design; physical impossibility of installing necessary control equipment; or other factors specific to the facility (or class of facilities) that make application of a less stringent standard or final compliance time significantly more reasonable. The implementing regulations also clarify that, absent such a demonstration, the State's standards of performance must be "no less stringent than the corresponding" EG. See 40 CFR 60.24a(c).

The EPA intends to provide further clarification on the general process and requirements for accounting for remaining useful life and other factors, including on the reasonableness aspect of the required demonstration, via a rulemaking to amend the implementing regulations in the near future. However, the EPA also recognizes that the oil and natural gas industry is unique such that the general approach to considering remaining useful life and other factors in the

implementing regulations may not be an ideal fit. For example, the sheer number and variety of designated facilities in the oil and natural gas industry could make a source-specific (or even a class-specific) evaluation of remaining useful life and other factors extremely difficult and burdensome for States that want to undertake a demonstration. In addition, the presumptive standards for these designated facilities generally entail fewer major capital expenses compared with other industries for which EPA has previously issued EG under CAA section 111(d), and many of the proposed presumptive standards generally take the form of design, equipment, work practice, or operational standards rather than numerical emission limitations. Further, in proposing the presumptive standards for existing sources, the EPA has deliberately included certain flexibilities (*e.g.,* in cases of technical infeasibility) such that the EPA believes the presumptive standards should be achievable and cost-effective for a wide variety of facilities across the source category. Given these facts, the EPA believes that it would likely be difficult for States to demonstrate that the presumptive standards are not reasonable for the vast majority of designated facilities. The EPA is soliciting comment on these observations, and any other facts and circumstances that are unique to the oil and natural gas industry that could impact the remaining-useful-life-and-other-factors demonstration. The EPA is also soliciting comment as to whether the Agency should include specific provisions regarding the consideration of remaining useful life and other factors in this EG that would supplement or supersede the general provisions in the implementing regulations.

To the extent a State chooses to submit a plan that includes standards of performance that are more stringent than the requirements of the final EG, States have the authority to do so under CAA section 116, and the EPA has the authority to approve such plans and render them

Federally enforceable if all applicable requirements are met. *Union Electric Co. v. EPA*, 427 U.S. 246, (1976). See also 40 CFR 60.24a(f). The EPA acknowledges that in the Affordable Clean Energy (ACE) rule, it previously took the position that *Union Electric* does not control the question of whether CAA section 111(d) State plans may be more stringent than Federal requirements. The ACE rule took this position on the basis that *Union Electric* on its face applies only to CAA section 110, and that it is potentially salient that CAA section 111(d) is predicated on specific technologies whereas CAA section 110 gives States broad latitude in the measures used for attaining the National Ambient Air Quality Standards (NAAQS). 84 FR 32559-61 (July 8, 2019). The EPA no longer takes this position. Upon further evaluation, the EPA believes that because of the structural similarities between CAA sections 110 and 111(d), CAA section 116 as interpreted by *Union Electric* requires the EPA to approve CAA section 111(d) State plans that are more stringent than required by the EG if the plan is otherwise is compliance with all applicable requirements. *See FCC v. Fox Television Stations, Inc.*, 556 U.S. 502 (2009). The D.C. Circuit in *Union Electric* rejected a construction of CAA sections 110 and 116 that measures more stringent than those required to attain the NAAQS cannot be approved into a Federally enforceable State Implementation Plan (SIP) but must be adopted and enforced only as a matter of State law. *Id.* at 263-64. While the BSER and the NAAQS are distinct from one another in that the former is technology-based and the latter is based on ambient air quality, both CAA sections 111(d) and 110 are structurally similar in that States must adopt and submit to the EPA plans which include requirements to meet the objectives of each respective section. Requiring States to enact and enforce two sets of standards, one that is a Federally approved CAA section 111(d) plan and one that is a stricter State plan, runs directly afoul of the court's

holding that there is no basis for interpreting CAA section 116 in such manner. Therefore, the EPA interprets CAA sections 111(d) and 116 as allowing States to include, and the EPA to approve, more stringent standards of performance in State plans. The EPA notes that its authority is constrained to approving measures which comport with applicable statutory and regulatory requirements. For example, CAA section 111(d) only contemplates that State plans include requirements for designated facilities, therefore the EPA believes it does not have the authority to approve and render Federally enforceable measures on other entities.

The EPA is also aware that in the context of regulating the oil and natural gas industry many States have existing programs they may want to leverage for purposes of satisfying their CAA section 111(d) State plan obligations. The EPA anticipates providing information on ways in which State plans can accommodate existing State programs to the extent such programs are at least as stringent as the requirement of the final EG. Consistent with the proposed presumptive standards, the EPA proposes that a State plan which relies on an existing State program must still establish standards of performance that are in the same form as the presumptive standards. The EPA solicits comment on whether States relying on existing programs should be authorized to include a different form of standard in their plans so long as they demonstrate the equivalency of such standards to the level of stringency required under the final EG, and how such equivalency demonstrations can be made in a rigorous and consistent way. The EPA proposes to require that, in situations where a State wishes to rely on State programs (statutes and/or regulations) that pre-date finalization of the EG proposed in this document to satisfy the requirements of CAA section 111(d), the State plan should identify which aspects of the existing State programs are being submitted for approval as Federally enforceable requirements under the plan, and include a

detailed explanation and analysis of how the relied upon existing State programs are at least as stringent as the requirements of the final EG. The EPA notes that the completeness criteria in 40 CFR 60.27a(g) requires a copy of the actual State law/regulation or document submitted for approval and incorporation into the State plan. Put another way, where a State is relying on an existing State program for its plan, a copy of the pre-existing State statute or regulation underpinning the program would be required by this criterion, and would be a critical component of the EPA's evaluation of the approvability of the plan. The EPA also solicits comment on various ways in which existing State programs can be adopted into State plans. Particularly, the EPA is interested in how existing State programs that regulate both designated facilities and sources not considered as designated facilities under this EG could be tailored for a State plan to meet the requirements of CAA section 111(d).

Providing Measures that Implement and Enforce Such Standards. As part of establishing standards of performance, State plans must also include compliance schedules for those standards. See 40 CFR 60.24a(a). Section XIV.E, explains how the EPA is proposing to approach compliance schedules. The EPA's implementing regulations require that, except where the State chooses to account for remaining useful life and other factors, State plans shall require final compliance as expeditiously as practicable, but no later than the compliance times specified in the EG. See 40 CFR 60.24a(c). Where a State applies a less stringent standard of performance because of remaining useful life and other factors, the compliance schedule must appropriately comport with that standard.[339]

[339] 40 CFR 60.24a(d) additionally required state plans to include increments of progress for any compliance schedule that extended more than 24 months after the state plan submittal date.

In addition to establishing standards of performance and compliance schedules, State plans must also include, adequately document, and demonstrate the methods employed to implement and enforce the standards of performance such that the EPA can review and identify measures that assure transparent and verifiable implementation. As part of ensuring that regulatory obligations appropriately meet statutory requirements such as enforceability, the EPA has historically and consistently required that obligations placed on sources be quantifiable, non-duplicative, permanent, verifiable, and enforceable. See 40 CFR 60.27a(g)(3)(vi). In accordance with the EPA's implementing regulations, standards of performance required for designated facilities as part of a State plan to implement the EG proposed here must be non-duplicative, permanent, verifiable, and enforceable. The EPA acknowledges that it may not be feasible to quantify certain non-numerical standards of performance included in the EG. As such, the EPA is proposing that standards of performance for this EG be quantifiable to the extent feasible. A State plan implementing the EG should include information adequate to support a determination by the EPA that the plan meets these requirements. Additionally, States must include appropriate monitoring, reporting, and recordkeeping requirements to ensure that State plans adequately provide for the implementation and enforcement of standards of performance. For designated facilities where the EPA's presumptive standards include associated monitoring, reporting, and/or recordkeeping requirements, the EPA has determined that such requirements are necessary to ensure compliance. Thus, for those designated facilities, the EPA is proposing to

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While the substantive requirement for increments of progress was not challenged and remains effective, the timing aspect of this provision was vacated by the D.C. Circuit. *Am. Lung Assoc.*, 985 F.3d at 991. The EPA intends to address the timing aspect of this provision in the near future.

require that the standards of performance established by States maintain the same monitoring, reporting, and recordkeeping requirements, or equivalent requirements. For example, the EG's presumptive standards for fugitives monitoring at well sites includes requirements for owners and operators to maintain records and submit reports that demonstrate compliance with the monitoring and repair provisions. As such, the EPA is proposing that the portion of the State plan which establishes standards of performance for that designated facility also includes requirements for owners and operators to maintain records and submit reports that demonstrate compliance with the monitoring and repair provisions. Where a State plan adopts standards of performance that differ from the presumptive standards, the plan may accordingly include different monitoring, reporting, and recordkeeping requirements than those in the presumptive standards, but such requirements must be appropriate for the implementation and enforcement of the standards. For components of a State plan that differ from any presumptively approvable aspects of the final EG, the EPA will review the approvability of such components through notice and comment rulemaking.

Emissions Inventories. The implementing regulations at 40 CFR 60.25a contain generally applicable requirements for emission inventories, source surveillance, and reports. State plans must include provisions to meet these requirements as well. Section 60.25a further specifies that such data shall be summarized in the plan, and emission rates of designated pollutants from designated facilities shall be correlated with applicable standards of performance. Typically, the EPA would expect that State plans would present this information on a source-specific or unit-specific level. However, the EPA recognizes that due to the very large number of existing oil and

natural gas sources,[340] and the frequent change of configuration and/or ownership, that it may not be practical to require States to compile this information in the same way that is typically expected for other industries under other EG. Therefore, the EPA is soliciting comment on whether to supersede the requirements of 40 CFR 60.25a(a) for purposes of this EG. The EPA may supersede any requirement in its implementing regulations for CAA section 111(d) if done so explicitly in the EG. See 40 CFR 60.20a(a)(1). Specially, for the reasons explained previously, the EPA believes that in this context it could be difficult for the State plans to include "an inventory of all designated facilities, including emission data for the designated pollutants and information related to emissions as specified in appendix D to this part" as required by the first sentence in 40 CFR 60.25a(a). The EPA understands that States may not have such an inventory of all designated facilities already available and that creating such an inventory could be resource intensive. Likewise, the EPA understands that States may not have site-specific emissions data for each designated facility, and that creating such an inventory could also be very resource intensive. The EPA does not believe that such detailed information is necessary for States to develop standards of performance, and that standards of performance could be developed with a different type of emissions inventory data. Therefore, in order to avoid the potential burden that could be imposed by applying 40 CFR 60.25a(a) as written to this EG, the EPA is soliciting comment on whether the Agency should supersede the requirements of 40 CFR 60.25a(a) for purposes of this EG, and replace that requirement with a different emissions inventory requirement that seeks to represent the same general type of information but allows

[340] In the U.S. the EPA has identified over 15,000 oil and gas owners and operators, around 1 million producing onshore oil and gas wells, about 5,000 gathering and boosting facilities, over 650 natural gas processing facilities, and about 1,400 transmission compression facilities.

States to utilize existing inventories and emissions data. An example of an inventory that could be leveraged, and on which the EPA specifically solicits comment, is the GHGRP. The EPA envisions a superseding requirement that would not impose such a resource intensive burden on States by allowing use of an inventory of GHG emissions data and operational data for designated facilities during the most recent calendar year for which data is available at the time of State plan development and/or submission. The emissions inventory data submitted for this purpose could be derived from the GHGRP, and/or other available existing inventory information available to the State. The EPA recognizes that in this situation the facility definitions used for purposes of compiling the emissions inventory data might not be fully aligned with the designated facilities in the EG, and that it is possible that there could be designated facilities under this EG that are not required to report under the emissions inventory program being relied upon. Further, the EPA recognizes that the GHGRP may include a reporting threshold and/or utilize emission factors in a different manner than the EG. The EPA solicits comment on whether it is appropriate to utilize or supersede 40 CFR 60.25a(a) for purposes of this EG. Specifically, the EPA solicits comment on the practicality of States compiling an inventory for all designated facilities and on what reasonable alternatives may be more practical.

Meaningful Engagement. The fundamental purpose of CAA section 111 is to reduce emissions from certain stationary sources that cause, or significantly contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare. Therefore, a key consideration in the State's development of a State plan pursuant to an EG promulgated under CAA section 111(d) is the potential impact of the proposed plan requirements on public health

and welfare. A robust and meaningful public participation process during State plan development is critical to ensuring that these impacts are fully considered. The EPA is proposing and soliciting comment on requiring States to perform outreach and meaningful engagement with overburdened and underserved communities during the development process of their State plan pursuant EG OOOOc.

States often rely primarily on public hearings as the foundation of their public engagement in their State plan development process because a public hearing is explicitly required pursuant to the applicable regulations. The existing provisions in subpart Ba (40 CFR 60.23a(c)-(f)) detail the public participation requirements associated with the development of a CAA section 111(d) State plan. Per these implementing regulations, States must provide certain notice of and conduct one or more public hearings on their State plan before such plan is adopted and submitted to the EPA for review and action. However, robust and meaningful public involvement in the development of a State plan should go beyond the minimum requirement to hold a public hearing. Meaningful engagement should include ensuring that States share information with and solicit input from stakeholders at critical junctures during plan development, which helps ensure that a plan is adequately addressing the potential impacts to public health and welfare that are the core concern of CAA section 111.

This early engagement is especially important for those stakeholders and communities directly impacted by the GHG emissions from designated facilities within the Crude Oil and Natural Gas source category being addressed in a State plan developed pursuant the EG OOOOc. As reflected in section VI and VII of the preamble, engagement with stakeholders and in particular adjacent communities was key during the development of the proposed NSPS and EG

and will be key in the development of corresponding State plans that achieve the intended emission reductions and provide benefits to these communities. In recognizing that minority and low-income populations often bear an unequal burden of environmental harms and risks, the EPA continues to consider ways to protect them from adverse public health and environmental effects of air pollution emitted from sources within the Oil and Natural Gas Industry that are addressed in this proposed rulemaking. For these reasons, the EPA is proposing to include an additional requirement associated with the adoption and submittal of State plans pursuant to EG OOOOc (in addition to the current requirements of Subpart Ba) by requiring States to meaningfully engage with members of the public, including overburdened and underserved communities, during the plan development process and prior to adoption and submission of the plan to the EPA.

The EPA's authority for proposing to include an additional requirement for meaningful engagement is provided by the authority of both CAA sections 111(d) and 301(a)(1). Under CAA section 111(d), one of the EPA's obligations is to promulgate a process "similar" to that of CAA section 110 under which States submit plans that implement emission reductions consistent with the BSER. CAA section 110(a)(1) requires States to adopt and submit State implementation plans (SIPs) after "reasonable notice and public hearings." The Act does not define what constitutes "reasonable notice" under CAA section 110, and therefore the EPA may reasonably interpret this requirement in promulgating a process under which States submit section 111(d) plans. The EPA proposes to give the "reasonable notice" requirement additional and separate meaning from the "public hearing" requirement. Therefore, in addition to the generally applicable public participation requirements in 40 CFR 60.23a(c)-(f) (which presently only

require public notification of a public hearing), the EPA proposes to promulgate these additional meaningful engagement requirements within the EG OOOOc to ensure that the public has reasonable notice of relevant information and the opportunity to participate in the State plan development throughout the process. Given the public health and welfare objectives of CAA section 111(d) in regulating specific existing sources, the EPA believes it is reasonable to require meaningful engagement as part of the public participation process in order to further these objectives. Additionally, CAA section 301(a)(1) provides that the EPA is authorized to prescribe such regulations "as are necessary to carry out [its] functions under [the CAA]." The proposed meaningful engagement requirements would effectuate the EPA's function under CAA section 111(d) in prescribing a process under which States submit plans to implement the statutory directives of this section.

The proposed meaningful engagement requirements for State plan development would ensure that the process is inclusive, effective, and accessible to all. For this reason, the process must not be disproportionate or favor certain stakeholders. During the development of the State plan pursuant to EG OOOOc, the EPA expects States to identify any underserved or overburdened communities potentially impacted by the State plan. If any communities are identified, States should engage with these communities and develop public participation strategies to overcome linguistic, cultural, institutional, geographic, and other barriers to meaningful participation and ensure meaningful community representation in the process, recognizing diverse constituencies within any particular community. Community participation should occur as early as possible if it is to be meaningful. Meaningful engagement includes targeted outreach to underserved and overburdened communities, sharing information, and

soliciting input on State plan development and on any accompanying assessments. The EPA uses the term "underserved" to mean populations sharing a particular characteristic, as well as geographic communities, that have been systemically denied a full opportunity to participate in aspects of economic, social, and civic life, and the term "overburdened" in referring to minority, low-income, Tribal, and indigenous populations or communities in the U.S. that potentially experience disproportionate environmental harms and risks as a result of greater vulnerability to environmental hazards . This increased vulnerability may be attributable to an accumulation of both negative and lack of positive environmental, health, economic, or social conditions within these populations or communities. This engagement will help ensure that State plans achieve meaningful emission reductions, that overburdened communities partake in the benefits and gains of the State plan, and that these communities are protected from being adversely impacted by the State plan. The EPA recognizes that emissions from designated sources could cross State borders, and therefore may affect underserved and overburdened communities in neighboring States. The EPA is soliciting comment on how meaningful engagement should apply to communities outside of the State that is developing a State plan, for example if a State should coordinate with the neighboring State for outreach or directly contact the affected community.

In sections VI and VII of this preamble the EPA addresses environmental justice considerations, implications, and stakeholder outreach the agency is taking to help ensure vulnerable communities are not disproportionately impacted by this rule. The considerations, analyses, and outreach presented in these preamble sections could help States in designing, planning, and developing their own outreach and engagement plans associated with the development and implementation of their State plans to reduce emissions of GHGs from

designated facilities within the Crude Oil and Natural Gas source category.

To ensure that robust and meaningful public engagement process occurs as the States develop their CAA 111(d) plans, the EPA is also proposing to include a requirement within EG OOOOc for States to demonstrate in their plan submittal how they provided meaningful and timely engagement with all pertinent stakeholders, including, as necessary, industries and small businesses, as well as low-income communities, communities of color, and indigenous populations living near the designated facilities and who may be otherwise potentially affected by the State's plan. The State would be required to describe, in their plan submittal, the engagement they had with their stakeholders, including their overburdened and underserved communities. Additionally, the EPA would evaluate the States' demonstrations regarding meaningful public engagement as part of its completeness evaluation of a State plan submittal. If a State plan submission does not meet the required elements for public participation, including requirements for meaningful engagement, this may be ground for the EPA to find the submission incomplete or to disapprove the plan.

The EPA further notes that the implementing regulations allow a State to request the approval of different State procedures for public participation pursuant 40 CFR 60.23a(h). The EPA proposes to require that such alternate State procedures do not supersede the meaningful engagement requirements being proposed within EG OOOOc, so that a State would still be required to comply with the meaningful participation requirements even if they apply for a different procedure than the other public notice and hearing requirements under 40 CFR 60.23a. As provided in 40 CFR 60.23a(h), the EPA is proposing that States may also apply for, and the EPA may approve, alternate meaningful engagement procedures if, in the judgement of the

Administrator, the procedures, although different from the requirements of within EG OOOOc, in fact provide for adequate notice to and meaningful participation of the public.

D. Components of State Plan Submission

Under CAA section 111(d)(2), the EPA has an obligation to determine whether each State plan is "satisfactory." Therefore, in addition to identifying the components that the EG must include, the EPA's implementing regulations for CAA section 111(d) identify additional components that a State plan must include. Many of these requirements are found in 40 CFR 60.23a, 60.24a, 60.25a, and 60.26a. These provisions include requirements for components such as the following: procedures a State must go through for adopting a plan before submitting it to the EPA; the stringency of standards of performance and compliance timelines; emission inventories, reporting, and recordkeeping; and, the legal authority a State must show in adopting a plan. These requirements are also generally contained in a list of required State plan elements, referred to as the State plan completeness criteria, found at 40 CFR 60.27a(g)(2)-(3). If the EPA determines that a submitted plan does not meet these criteria then the State is treated as not submitting a plan and the EPA has a duty to promulgate a Federal plan for that State. See CAA section 111(d)(2)(A) and 40 CFR 60.27a(g)(1). If the EPA determines a plan submission is complete, such determination does not reflect a judgment on the eventual approvability of the submitted portions of the plan, which instead must be made through notice-and-comment rulemaking. The completeness criteria do not apply to States without any designated facilities because these States are directed to submit to the Administrator a letter of negative declaration certifying that there are no designated facilities, as defined by the EPA's emissions guidelines, located within the State. See 40 CFR 60.23a(b). No plan is required for States that do not have

any designated facilities. Designated facilities located in States that mistakenly submit a letter of negative declaration would be subject to a Federal plan until a State plan regulating those facilities becomes approved by the EPA.

The EPA established nine administrative and six technical criteria for complete State plans under CAA section 111(d). See 40 CFR 60.27a(g)(2)-(3). If a State plan does not include even one of these criteria, then the State plan may be deemed incomplete by the EPA. States that are familiar with the SIP submittal process under CAA section 110 will be familiar with the completeness criteria found in 40 CFR part 51 Appendix V. While the completeness criteria for State plan submittals found at 40 CFR 60.27a(g)(2)-(3) is somewhat similar to the SIP submittal criteria in Appendix V, it is not exactly the same. As such, even States that are familiar with the SIP submittal process under CAA section 110 are strongly encouraged to review the completeness criteria in 40 CFR 60.27a(g)(2)-(3) as well as the other State plan requirements found in 40 CFR 60.23a, 60.24a, 60.25a, and 60.26a early in their planning process.

In short, the administrative completeness criteria require that the State's plan include a formal submittal letter and a copy of the actual State regulations themselves, as well as evidence that the State has legal authority to adopt and implement the plan, actually adopted the plan, followed State procedural laws when adopting the plan, gave public notice of the changes to State law, held public hearing(s) if applicable, and responded to State-level comments. For a detailed description regarding the public hearing requirement, see 40 CFR 60.23a. For a detailed description of what the State plan must include in terms of evidence that the State has legal authority to adopt and implement the plan, see 40 CFR 60.26a. States are strongly encouraged to review the State plan requirements included in 40 CFR 60.23a and 60.26a in conjunction with

the administrative completeness criteria in 40 CFR 60.27a.

The technical criteria require that the State's plan identify the designated facilities, the standards of performance, the geographic scope of the plan, monitoring, recordkeeping and reporting requirements (both for facilities to ensure compliance and for the State to ensure performance of the plan as a whole), and compliance schedules. The technical criteria further require that the State demonstrate that the plan is projected to achieve emission performance under the EG and that each emission standard is quantifiable, non-duplicative, permanent, verifiable, and enforceable. As previously described, it may not be feasible to quantify certain non-numerical standards of performance. The EPA is proposing to require States demonstrate that each standard of performance is quantifiable, as feasible. For a detailed description of the State plan requirements regarding standards of performance, see section XIV.C and 40 CFR 60.24a.

In addition to these technical criteria, 40 CFR 60.25a(a) requires that State plans include certain emissions data for the designated facilities. As explained previously, the EPA is soliciting comment on superseding that requirement for this EG. Further, 60.25a provides a detailed description of what the State plan is required to include in terms of certain compliance monitoring and reporting. States are strongly encouraged to review the State plan requirements included in 40 CFR 60.24a and 60.25a in conjunction with the technical completeness criteria in 40 CFR 60.27a.

E. Timing of State Plan Submissions and Compliance Times

The EPA acknowledges that the D.C. Circuit has vacated certain timing provisions within 40 CFR 60, subpart Ba. *Am. Lung Assoc. v. EPA*, 985 F.3d at 991 (D.C. Cir. 2021). These

provisions include timing requirements for when State plans are due upon publication of a final EG, for EPA's action on a State plan submission, and for EPA's promulgation of a Federal plan. The Agency plans to undertake rulemaking to address the provisions vacated under the court's decision in the near future. At this time, the EPA is soliciting comment on any facts and circumstances that are unique to the oil and natural gas industry that the EPA should consider when proposing a timeline for plan submission applicable to a final EG for this source category. We recognize that the public needs to have an opportunity to review and comment on the new timelines that will address these regulatory gaps, including in particular the timeline for State plan submission, and the Agency is committed to publishing this proposed timeline for comment when available.

In accordance with 40 CFR 60.22a(b)(5), the EPA's EG is to provide information for the development of State plans that includes, among other things, "the time within which compliance with standards of performance can be achieved." The EPA is proposing those compliance times for comment. See 40 CFR 60.25a(c). Each State plan must include compliance schedules that, subject to certain exception, require compliance as expeditiously as practicable but no later than the compliance times included in the relevant EG. *Id.* at 60.24a(a) and (c). States are free to include compliance times in their plans that are earlier than those included in the final EG. *Id.* at 40 CFR 60.24a(f)(2). If a State chooses to include a compliance schedule in their plan that extends for a certain period beyond the date required for submittal of the plan, then "the plan must include legally enforceable increments of progress to achieve compliance for

each designated facility."[341] *Id.* at 40 CFR 60.24a(d). To the extent a State accounts for remaining useful life and other factors in applying a less stringent standard of performance (than required by the EPA in the final EG), the State must also include a compliance deadline that it can demonstrate appropriately correlates with that standard.

The EPA is proposing to require that State plans impose a compliance timeline on designated facilities to require final compliance with the standards of performance as expeditiously as practicable, but no later than two years following the State plan submittal deadline. As explained above, the EPA anticipates proposing a State plan submission deadline in a separate notice. The EPA believes that two years is an appropriate amount of time for designated facilities to ensure compliance based on the EPA's general understanding of the industry and the proposed presumptive standards. However, the EPA recognizes that there are many existing sources in the oil and natural gas industry that would be subject to a State plan if the presumptive standards are finalized in a similar manner as proposed in this document, and that there may be a wide range of configurations that may be present at any given facility. Further, the EPA recognizes that it may be appropriate to require different compliance times for different designated facilities. For example, it may be appropriate to require one compliance schedule for reciprocating compressors and a different compliance schedule for storage vessels. There may not be a one-size-fits-all approach to compliance times that is appropriate for all designated facilities.

Accordingly, the EPA is soliciting comment on whether a two-year compliance schedule

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[341] As previously noted, the timing aspect of this provision was vacated by the D.C. Circuit. *Am. Lung Assoc. v. EPA*, 985 F.3d 914 at 991. The EPA intends to address the timing aspect of this provision in the near future.

is appropriate for all designated facilities, or whether the EG should require a shorter or longer compliance schedule. The EPA is further soliciting comment on whether it would be appropriate to establish different compliance schedules for different designated facilities, and if so, what are the appropriate timelines for each designated facility. The EPA is soliciting comment on this matter to collect information that might inform different compliance timeline(s) that Agency may propose for comment in the future via a supplemental proposal.

F. EPA Action on State Plans and Promulgation of Federal Plans

While CAA section 111(d)(1) authorizes States to develop State plans that establish standards of performance and provides States with certain discretion in determining the appropriate standards, CAA section 111(d)(2) provides the EPA a specific oversight role with respect to such State plans. This latter provision authorizes the EPA to prescribe a Federal plan for a State "in cases where the State fails to submit a satisfactory plan." The States must therefore submit their plans to the EPA, and the EPA must evaluate each State plan to determine whether each plan is "satisfactory." The EPA's implementing regulations for CAA section 111(d) accordingly provide procedural requirements for the EPA to make such a determination. See 40 CFR 60.27a.

Upon receipt of a State plan, the EPA is first required to determine whether the State plan submittal is complete in accordance with the completeness criteria explained above. See 40 CFR 60.27a(g)(1). The EPA would then have a set period of time to act on any State plan that is deemed complete.[342] If the EPA determines that the State plan submission is incomplete, then the

[342] As explained above, the D.C. Circuit vacated the timing provisions regarding EPA's action on a state plan submission, and EPA's promulgation of a Federal plan. *Am. Lung Assoc. v. EPA*, 985

State will be treated as not having made the submission, and the EPA would be required to promulgate a Federal plan for the designated facilities in that State. Likewise, if a State does not make any submission then the EPA is required to promulgate a Federal plan. If the EPA does not make an affirmative determination regarding completeness of the State plan submission within a certain amount of time from receiving the State plan, then the submission is deemed complete by operation of law. *Id.*

If a State has submitted a complete plan, then the EPA is required to evaluate that plan submission for approvability in accordance with the CAA, EPA's implementing regulations, and the applicable EG. The EPA may approve or disapprove the State plan submission in whole or in part. See 40 CFR 60.27a(b). If the EPA approves the State plan submission, then that State plan becomes Federally enforceable. If the EPA disapproves the required State plan submission, in whole or in part, then the EPA is required to promulgate a Federal plan for the designated facilities in that State via a notice-and-comment rulemaking, and with an opportunity for public hearing. See 40 CFR 60.27a(c) and (f). In either scenario that would give rise to the EPA's duty to promulgate a Federal plan (a finding that a State did not submit a complete plan or a disapproval of a State plan), the EPA would not be required to promulgate the Federal plan if the State corrects the deficiency giving rise to the EPA's duty and the EPA approves the State's plan before promulgating the Federal plan. Requirements regarding the content of a Federal plan are included in 40 CFR 60.27a(e).

G. Tribes and The Planning Process Under CAA Section 111(d)

F.3d at 991. The Agency plans to undertake rulemaking to address the provisions vacated under the court's decision in the near future.

Under the Tribal Authority Rule (TAR) adopted by the EPA, Tribes may seek authority to implement a plan under CAA section 111(d) in a manner similar to a State. See 40 CFR part 49, subpart A. Tribes may, but are not required to, seek approval for treatment in a manner similar to a State for purposes of developing a Tribal Implementation Plan (TIP) implementing the EG. If a Tribe obtains approval and submits a TIP, the EPA will generally use similar criteria and follow similar procedures as those described above for State plans when evaluating the TIP submission, and will approve the TIP if appropriate. The EPA is committed to working with eligible Tribes to help them seek authorization and develop plans if they choose. Tribes that choose to develop plans will generally have the same flexibilities available to States in this process. If a Tribe does not seek and obtain the authority from the EPA to establish a TIP, the EPA has the authority to establish a Federal CAA section 111(d) plan for areas of Indian country where designated facilities are located. A Federal plan would apply to all designated facilities located in the areas of Indian country covered by the Federal plan unless and until the EPA approves an applicable TIP applicable to those facilities.

XV. Prevention of Significant Deterioration and Title V Permitting

In this section, the EPA is addressing how regulation of GHGs under CAA section 111 could have implications for other EPA rules and for permits written under the CAA PSD preconstruction permit program and the CAA title V operating permit program. The EPA is proposing to include provisions in the regulations that explicitly address some of these potential implications, consistent with our experience in prior rules regulating GHGs. The EPA included and explained the basis for similar provisions when promulgating 2016 NSPS OOOOa, as well as the 2015 subpart TTTT NSPS for electric utility generating units. See 81 FR 35823, 35871

(June 3, 2016); 80 FR 64509, 64628 (October 23, 2015). The discussion in these prior rule preambles equally applies to the oil and gas sources subject to NSPS OOOOb and EG OOOOc.

In summary, in light of the U.S. Supreme Court's decision in *Utility Air Regulatory Group v. Environmental Protection Agency*, 573 U.S. 302 (2014) (*UARG*), the EPA may not treat GHGs as an air pollutant for purposes of determining whether a source is a major source (or modification thereof) for the purpose of PSD applicability. Certain portions of the EPA's PSD regulations (specifically, the definition of "subject to regulation") effectively ensure that most sources will not trigger PSD solely by virtue of their GHG emissions. *E.g.*, 40 CFR 51.166(b)(48)(iv), 52.21(b)(49)(iv).[343] However, the EPA's PSD regulations (specifically, the definition of "regulated NSR pollutant") provide additional bases for PSD applicability for pollutants that are regulated under CAA section 111. To address this latter component of PSD applicability, the EPA is proposing to add provisions within the subpart OOOOb NSPS and OOOOc EG to help clarify that the promulgation of GHG standards under section 111 will not result in additional sources becoming subject to PSD based solely on GHG emissions, which would be contrary to the holding in *UARG*. These provisions will be similar to those in the 2016 NSPS OOOOa and other section 111 rules that regulate GHGs. *See, e.g.*, 40 CFR 60.5360a(b)(1)-(2), 60.5515(b)(1)-(2).

The EPA understands there are also concerns that if methane were to be subject to regulation as a separate air pollutant from GHGs, sources that emit methane above the PSD thresholds or modifications that increase methane emissions could be subject to the PSD

[343] In 2016, the EPA proposed additional revisions to the PSD and title V regulations that would address these and other concerns. 81 FR 58110 (October 3, 2016).

program. To address this concern and for purposes of clarity, the EPA is proposing to adopt regulatory text within subparts OOOOb NSPS and OOOOc EG to clarify that the air pollutant that is subject to regulation is GHGs, even though the standard is expressed in the form of a limitation on emission of methane. This language will be substantially similar to language found in, for example, the 2016 NSPS OOOOa and other rules. See, *e.g.*, 40 CFR 60.5360a(a), 60.5515(a).

For sources that are subject to the PSD program based on non-GHG emissions, the CAA continues to require that PSD permits satisfy the best available control technology (BACT) requirement for GHGs. Based on the language in the PSD regulations, the EPA and States may continue to limit the application of BACT to GHG emissions in those circumstances where a new source emits GHGs in the amount of at least 75,000 tpy on a CO_2 Eq. basis or an existing major source increases emissions of GHGs by more than 75,000 tpy on a CO_2 Eq. basis. See 40 CFR 51.166(b)(48)(iv), 52.21(b)(49)(iv). The proposed revisions to the regulatory text within subparts OOOOb NSPS and OOOOc EG will ensure that this BACT applicability level remains operable to sources of GHGs regulated under CAA section 111, as have similar revisions in prior rules. See, *e.g.*, 40 CFR 60.5360a(b)(1)-(2), 60.5515(b)(1)-(2). This proposed rule will not require any additional revisions to SIPs.

Regarding title V, the *UARG* decision similarly held that the EPA may not treat GHGs as an air pollutant for purposes of determining whether a source is a major source for the purpose of title V applicability. Promulgation of CAA section 111 requirements for GHGs will not result in the EPA imposing a requirement that stationary sources obtain a title V permit solely because such sources emit or have the potential to emit GHGs above the applicable major source

thresholds.[344]

To be clear, however, unless exempted by the Administrator through regulation under CAA section 502(a), any source, including a "non-major source," subject to a standard or regulation under section 111 is required to apply for, and operate pursuant to, a title V permit that ensures compliance with all applicable CAA requirements for the source, including any GHG-related applicable requirements. This aspect of the title V program is not affected by *UARG*.[345] The EPA proposes to include an exemption from the obligation to obtain a title V permit for sources subject to NSPS OOOOb and EG OOOOc, unless such sources would otherwise be required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a), as the EPA did in NSPS OOOO and OOOOa.[346] See 40 CFR 60.5370, 60.5370a. However, sources that are subject to the CAA section 111 standards promulgated in this rule and that are otherwise required to obtain a title V permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) will be required to apply for, and operate pursuant to, a title V permit that ensures compliance with all applicable

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[344] Additional regulatory text, based on that in prior rules, will further ensure that title V regulations are not applied to GHGs solely because they are regulated under CAA section 111. See, *e.g.*, 40 CFR 60.5360a(b)(3)-(4), 60.5515(b)(3)-(4). The EPA understands that concerns regarding the regulation of methane as a separate air pollutant (described with respect to PSD) also apply to title V. The EPA's proposed regulatory text—clarifying that the pollutant subject to regulation is GHGs—will similarly address these concerns with respect to title V. See, *e.g.*, 40 CFR 60.5360a(a), 60.5515(a).

[345] See Memorandum from Janet G. McCabe, Acting Assistant Administrator, Office of Air and Radiation, and Cynthia Giles, Assistant Administrator, Office of Enforcement and Compliance Assurance, to Regional Administrators, Regions 1-10, *Next Steps and Preliminary Views on the Application of Clean Air Act Permitting Programs to Greenhouse Gases Following the Supreme Court's Decision in Utility Regulatory Group v. Environmental Protection Agency* (July 24, 2014) at 5.

[346] The EPA provided the rationale for exempting this source category from the title V permitting requirements during the rulemaking for the 2012 NSPS OOOO. See 76 FR 52737, 52751 (August 23, 2011). That rationale continues to apply to this source category.

CAA requirements, including any GHG-related applicable requirements.

XVI. Impacts of This Proposed Rule

A. What are the air impacts?

The EPA projected that, from 2023 to 2035, relative to the baseline, the proposed NSPS OOOOb and EG OOOOc will reduce about 41 million short tons of methane emissions reductions (920 million tons CO_2 Eq.), 12 million short tons of VOC emissions reductions, and 480 thousand short tons of HAP emission reductions from facilities that are potentially affected by this proposal. The EPA projected regulatory impacts beginning in 2023 as that year represents the first full year of implementation of the proposed NSPS OOOOb. The EPA assumes that emissions impacts of the proposed EG OOOOc will begin in 2026. The EPA projected impacts through 2035 to illustrate the accumulating effects of this rule over a longer period. The EPA did not estimate impacts after 2035 for reasons including limited information, as explained in the RIA.

B. What are the energy impacts?

The energy impacts described in this section are those energy requirements associated with the operation of emission control devices. Potential impacts on the national energy economy from the rule are discussed in the economic impacts section in XVI.D. There will likely be minimal change in emissions control energy requirements resulting from this rule. Additionally, this proposed action continues to encourage the use of emission controls that recover hydrocarbon products that can be used on-site as fuel or reprocessed within the production process for sale.

C. What are the compliance costs?

The PV of the regulatory compliance cost associated with the proposed NSPS OOOOb and EG OOOOc over the 2023 to 2035 period was estimated to be $13 billion (in 2019 dollars) using a 3-percent discount rate and $10 billion using a 7-percent discount rate. The EAV of these cost reductions is estimated to be $1.2 billion per year using a 3-percent discount rate and $1.2 billion per year using a 7-percent discount rate.

These estimates do not, however, include the producer revenues associated with the projected increase in the recovery of saleable natural gas. Estimates of the value of the recovered product have been included in previous regulatory analyses as offsetting compliance costs. Using the 2021 Annual Energy Outlook (AEO) projection of natural gas prices to estimate the value of the change in the recovered gas at the wellhead projected to result from the proposed action, the EPA estimated a PV of regulatory compliance costs of the proposed rule over the 2023 to 2035 period of $7.2 billion using a 3-percent discount rate and $6.3 billion using a 7-percent discount rate. The corresponding estimates of the EAV of compliance costs after accounting for the recovery of saleable natural gas were $680 million per year using a 3-percent discount rate and $760 million using a 7-percent discount rate.

D. What are the economic and employment impacts?

The EPA conducted an economic impact and distributional analysis for this proposal, as detailed in section 4 of the RIA for this proposal. To provide a partial measure of the economic consequences of the proposed NSPS OOOOb and EG OOOOc, the EPA developed a pair of single-market, static partial-equilibrium analyses of national crude oil and natural gas markets. We implemented the pair of single-market analyses instead of a coupled market or general equilibrium approach to provide broad insights into potential national-level market impacts while

providing maximum analytical transparency. We estimated the price and quantity impacts of the proposed NSPS OOOOb and EG OOOOc on crude oil and natural gas markets for a subset of years within the time horizon analyzed in the RIA. The models are parameterized using production and price data from the U.S. Energy Information Administration and supply and demand elasticity estimates from the economics literature.

The RIA projects that regulatory costs are at their highest in 2026, the first year the requirements of both the proposed NSPS OOOOb and EG OOOOc are assumed to be in effect and will represent the year with the largest market impacts based upon the partial equilibrium modeling. We estimated that the proposed rule could result in a maximum decrease in annual natural gas production of about 249 million Mcf in 2026 (or about 0.8 percent of natural gas production) with a maximum price increase of $0.05 per Mcf (or about 1.8 percent). We estimated the maximum annual reduction in crude oil production would be about 12.2 million barrels (or about 0.3 percent of crude oil production) with a maximum price increase of about $0.06 per barrel (or less than 0.1 percent).

Before 2026, the modeled market impacts are much smaller than the 2026 impacts as only the incremental requirements under the proposed NSPS OOOOb are assumed to be in effect. As regulatory costs are projected to decline after 2026, the modelled market impacts for years after 2026 are smaller than the peaks estimated for 2026. Please see section 4.1 of the RIA for more detail on the formulation and implementation of the model as well as a discussion of several important caveats and limitations associated with the approach.

As discussed in the RIA for this proposal, employment impacts of environmental regulations are generally composed of a mix of potential declines and gains in different areas of

the economy over time. Regulatory employment impacts can vary across occupations, regions, and industries; by labor and product demand and supply elasticities; and in response to other labor market conditions. Isolating such impacts is a challenge, as they are difficult to disentangle from employment impacts caused by a wide variety of ongoing, concurrent economic changes.

The oil and natural gas industry directly employs approximately 140,000 people in oil and natural gas extraction, a figure which varies with market prices and technological change, and employs a large number of workers in related sectors that provide materials and services.[347] As indicated above, the proposed NSPS OOOOb and EG OOOOc are projected to cause small changes in oil and natural gas production and prices. As a result, demand for labor employed in oil and natural gas-related activities and associated industries might experience adjustments as there may be increases in compliance-related labor requirements as well as changes in employment due to quantity effects in directly regulated sectors and sectors that consume oil and natural gas products.

E. What are the benefits of the proposed standards?

To satisfy the requirement of EO 12866 and to inform the public, the EPA estimated the climate and health benefits due to the emissions reductions projected under the proposed NSPS OOOOb and EG OOOOc. The EPA expects climate and health benefits due to the emissions reductions projected under the proposed NSPS OOOOb and EG OOOOc. The EPA estimated the global social benefits of CH_4 emission reductions expected from this proposed rule using the SC-CH_4 estimates presented in the "Technical Support Document: Social Cost of Carbon, Methane,

[347] Employment figure drawn from the Bureau of Labor Statistics Current Employment Statistics for NAICS code 211.

and Nitrous Oxide Interim Estimates under EO 13990 (IWG 2021)" published in February 2021 by the Interagency Working Group on the Social Cost of Greenhouse Gases (IWG). The SC-CH_4 is the monetary value of the net harm to society associated with a marginal increase in emissions in a given year, or the benefit of avoiding that increase. In principle, SC-CH_4 includes the value of all climate change impacts, including (but not limited to) changes in net agricultural productivity, human health effects, property damage from increased flood risk and natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services. The SC-CH_4 therefore, reflects the societal value of reducing emissions of the gas in question by one metric ton and is the theoretically appropriate value to use in conducting benefit-cost analyses of policies that affect CH_4 emissions.

The interim SC-GHG estimates were developed over many years, using a transparent process, peer-reviewed methodologies, the best science available at the time of that process, and with input from the public. As a member of the IWG involved in the development of the February 2021 Technical Support Document (TSD): Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990 (IWG 2021), the EPA agrees that the interim SC-GHG estimates represent the most appropriate estimate of the SC-GHG until revised estimates have been developed reflecting the latest, peer-reviewed science.

The EPA estimated the PV of the climate benefits over the 2023 to 2035 period to be $55 billion at a 3-percent discount rate. The EAV of these benefits is estimated to be $5.2 billion per year at a 3-percent discount rate. These values represent only a partial accounting of climate impacts from methane emissions and do not account for health effects of ozone exposure from the increase in methane emissions.

Under the proposed NSPS OOOOb and EG OOOOc, the EPA expects that VOC emission reductions will improve air quality and are likely to improve health and welfare associated with exposure to ozone, $PM_{2.5}$, and HAP. Calculating ozone impacts from VOC emissions changes requires information about the spatial patterns in those emissions changes. In addition, the ozone health effects from the proposed rule will depend on the relative proximity of expected VOC and ozone changes to population. In this analysis, we have not characterized VOC emissions changes at a finer spatial resolution than the national total. In light of these uncertainties, we present an illustrative screening analysis in Appendix B of the RIA based on modeled oil and natural gas VOC contributions to ozone concentrations as they occurred in 2017 and do not include the results of this analysis in the estimate of benefits and net benefits projected from this proposal.

XVII. Statutory and Executive Order Reviews

Additional information about these statutes and EOs can be found at *https://www.epa.gov/laws-regulations/laws-and-executive-orders*.

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

This proposed action is an economically significant regulatory action that was submitted to the OMB for review. Any changes made in response to OMB recommendations have been documented in the docket. The EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis, "Regulatory Impact Analysis for the Proposed Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review", is available in the docket and describes in detail the EPA's assumptions and characterizes the various sources of

uncertainties affecting the estimates.

B. Paperwork Reduction Act (PRA)

The information collection activities in the proposed amendments for 40 CFR part 60 subparts OOOO and OOOOa have been submitted for approval to the Office of Management and Budget (OMB) under the PRA. The information collection activities in the proposed rules for 40 CFR part 60 subparts OOOOb and OOOOc will be submitted for approval to OMB under the PRA as part of a supplemental proposed rule.[348] The Information Collection Request (ICR) document that the EPA prepared has been assigned EPA ICR number 2523.04. You can find a copy of the ICR in the docket for this rule, and it is briefly summarized here.

The final rule for this action will include updates to the CFR to reflect the disapproval of the 2020 Policy Rule that was effectuated by the joint resolution enacted pursuant to the CRA on June 30, 2021. The EPA is not soliciting comment on these updates. In addition, this rule proposes amendments to the 2016 NSPS OOOOa to address (1) certain resulting inconsistencies between the VOC and methane standards resulting from the CRA, and (2) rescind certain determinations made in the 2020 Technical Rule, with respect to fugitive emissions monitoring at low production well sites and gathering and boosting stations as they were not supported by the record for that rule, or by our subsequent information and analysis. The EPA is also

[348] While not quantified in this proposal, the EPA anticipates the estimated ICR burden of proposed NSPS OOOOb and EG OOOOc to be at least as burdensome as NSPS OOOOa. The EPA anticipates some sources may have similar ICR burden to NSPS OOOOa. Examples of these include fugitive emissions from compressor stations, pneumatic controllers at gas processing, centrifugal compressors, pneumatic pumps, well completions, and sweetening units. The EPA anticipates other sources could have dissimilar burden to NSPS OOOOa because the standards are different or are brand new to this proposal. Examples of these include fugitive emissions from well sites, storage vessels, pneumatic controllers, reciprocating compressors, liquids unloading, and equipment leaks at gas plants.

proposing further amendments to its 2016 NSPS OOOOa to address technical and implementation issues.

This ICR reflects the EPA's proposed amendments to the 2016 NSPS OOOOa. The information collected will be used by the EPA and delegated State and local agencies to determine the compliance status of affected facilities subject to the rule.

The respondents are owners or operators of onshore oil and natural gas affected facilities (40 CFR 60.5365a). For the purposes of this ICR, it is assumed that oil and natural gas affected facilities located in the U.S. are owned and operated by the oil and natural gas industry, and that none of the affected facilities in the U.S. are owned or operated by State, local, Tribal or the Federal government. All affected facilities are assumed to be privately owned for-profit businesses.

The EPA estimates an average of 3,268 respondents will be affected by NSPS OOOOa over the three-year period (2021-2023). The average annual burden for the recordkeeping and reporting requirements for these owners and operators is 283,030 person-hours, with an average annual cost of $93,779,839 over the three-year period (2021-2023).

Respondents/affected entities: Oil and natural gas operators and owners.

Respondent's obligation to respond: Mandatory.

Estimated number of respondents: 3,268.

Frequency of response: Varies depending on affected facility.[349]

Total estimated burden: 283,030 hours (per year). Burden is defined at 5 CFR 1320.3(b).

[349] The specific frequency for each information collection activity within this request is shown in Tables 1a through 1d of the Supporting Statement in the public docket.

Total estimated cost: $93,779,839 (2019$), which includes no capital or O&M costs.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the EPA's regulations in 40 CFR are listed in 40 CFR part 9. Submit your comments on the Agency's need for this information, the accuracy of the provided burden estimates and any suggested methods for minimizing respondent burden to the EPA using the docket identified at the beginning of this rule. You may also send your ICR-related comments to OMB's Office of Information and Regulatory Affairs via email to *OIRA_submission@omb.eop.gov*, Attention: Desk Officer for the EPA. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after receipt, OMB must receive comments no later than [**INSERT DATE 30 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER**]. The EPA will respond to any ICR-related comments in the final rule.

C. Regulatory Flexibility Act (RFA)

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

For purposes of assessing the impacts of this rule on small entities, a small entity is defined as: (1) A small business in the oil or natural gas industry whose parent company has revenues or numbers of employees below the SBA Size Standards for the relevant NAICS code; (2) a small governmental jurisdiction that is a government of a city, county, town, school district,

or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

Pursuant to section 603 of the RFA, the EPA prepared an initial regulatory flexibility analysis (IRFA) that examines the impact of the proposed rule on small entities along with regulatory alternatives that could minimize that impact. The complete IRFA is available for review in the docket and is summarized here.

The IRFA describes the reason why the proposed rule is being considered and describes the objectives and legal basis of the proposed rule, as well as discusses related rules affecting the oil and natural gas sector. The IRFA describes the EPA's examination of small entity effects prior to proposing a regulatory option and provides information about steps taken to minimize significant impacts on small entities while achieving the objectives of the rule.

The EPA also summarized the potential regulatory cost impacts of the proposed rule and alternatives in Section 2 of the RIA. The analysis in the IRFA drew upon some of the same analyses and assumptions as the analyses presented in the RIA. The IRFA analysis is presented in its entirely in Section 4.3 of the RIA.

We estimated cost-to-sales ratios (CSR) for each small entity to summarize the impacts of the proposed rule on small entities. In the processing segment, we find that average compliance costs are expected to be negative, and no entity has a cost-to-sales ratio greater than either 1 percent or 3 percent. In the production segment, when expected revenues from natural gas product recovery are included, 101 small entities (7.2 percent) have cost-to-sales ratios greater than 1 percent, but none have cost-to-sales ratios greater than 3 percent. When expected

revenues from natural gas product recovery are excluded, the number of small entities with cost-to-sales ratios greater than 1 percent increases to 331 (23 percent); about half of those small entities (11 percent) also have cost-to-sales ratios greater than 3 percent.

The analysis above is subject to a number of caveats and limitations. These are discussed in detail in the IRFA, as well as in Section 4.3 of the RIA. As required by section 609(b) of the RFA, the EPA also convened a Small Business Advocacy Review (SBAR) Panel to obtain advice and recommendations from small entity representatives that potentially would be subject to the rule's requirements. The SBAR Panel evaluated the assembled materials and small-entity comments on issues related to elements of an IRFA. A copy of the full SBAR Panel Report is available in the rulemaking docket.

D. Unfunded Mandates Reform Act (UMRA)

The proposed NSPS and EG do not contain an unfunded mandate of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and do not significantly or uniquely affect small governments. The proposed NSPS does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and Tribal governments, in the aggregate or the private sector in any one year. For projected cost estimates, see "Regulatory Impact Analysis for the Proposed Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review", which is available in the docket. The EG is proposed under CAA section 111(d) and does not impose any direct compliance requirements on designated facilities, apart from the requirement for States to develop State plans. As explained in section XIV.G., the EG also does not impose specific requirements on Tribal governments that have designated facilities located in their area of Indian

country. The burden for States to develop State plans following promulgation of the rule is estimated to be below $100 million in any one year. Thus, the EG is not subject to the requirements of section 203 or section 205 of the UMRA.

The NSPS and EG are also not subject to the requirements of section 203 of UMRA because, as described in 2 U.S.C. 1531– 38, they contain no regulatory requirements that might significantly or uniquely affect small governments. The NSPS and EG action imposes no enforceable duty on any State, local, or Tribal governments or the private sector. Specifically, for the EG the State governments to which rule requirements apply are not considered small governments. In light of the interest among governmental entities, the EPA conducted pre-proposal outreach with national organizations representing States and Tribal governmental entities while formulating the proposed rule as discussed in section VII. The EPA considered the stakeholders' experiences and lessons learned to help inform how to better structure this proposal and consider ongoing challenges that will require continued collaboration with stakeholders. With this proposal, the EPA seeks further input from States and Tribes. For public input to be considered during the formal rulemaking, please submit comments on this proposed action to the formal regulatory docket at EPA Docket ID No. EPA-HQ-OAR-2021-0317 so that the EPA may consider those comments during the development of the final rule.

E. Executive Order 13132: Federalism

Under Executive Order 13132, the EPA may not issue an action that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or the EPA consults with State and local officials early in the process of developing the proposed action.

The proposed NSPS OOOOb does not have Federalism implications. It will not have substantial direct effects on the States, on the relationship between the Federal government and the States, or on the distribution of power and responsibilities among the various levels of government.

The proposed EG OOOOc may have Federalism implications because development of State plans may entail many hours of staff time to develop and coordinate programs for compliance with the proposed rule, as well as time to work with State legislatures as appropriate, and develop a plan submittal. The Agency understands that the EG may impose a burden on States and is committed to providing aid and guidance to States through the plan development process. In the spirit of EO 13132 and consistent with the EPA policy to promote communications between the EPA and State and local governments, the EPA specifically solicits comment on this proposed rule from State and local officials including information on costs associated with developing and submitting State plans in accordance with EG OOOOc.

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

This action has Tribal implications. However, it will neither impose substantial direct compliance costs on Federally recognized Tribal governments, nor preempt Tribal law, and does not have substantial direct effects on the relationship between the Federal government and Indian Tribes or on the distribution of power and responsibilities between the Federal government and Indian Tribes, as specified in EO 13175. 65 FR 67249 (November 9, 2000). The majority of the designated facilities impacted by proposed NSPS and EG on Tribal lands are owned by private entities, and Tribes will not be directly impacted by the compliance costs associated with this rulemaking. There would only be Tribal implications associated with this rulemaking in the case

where a unit is owned by a Tribal government or in the case of the NSPS, a Tribal government is given delegated authority to enforce the rulemaking. Tribes are not required to develop plans to implement the EG under CAA section 111(d) for designated existing sources. The EPA notes that this proposal does not directly impose specific requirements on designated facilities, including those located in Indian country, but before developing any standards for sources on Tribal land, the EPA would consult with leaders from affected Tribes.

Consistent with previous actions affecting the Crude Oil and Natural Gas source category, there is significant Tribal interest because of the growth of the oil and natural gas production in Indian country. Consistent with the EPA Policy on Consultation and Coordination with Indian Tribes, the EPA will engage in consultation with Tribal officials during the development of this action.

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

This action is subject to EO 13045 (62 FR 19885, April 23, 1997) because it is an economically significant regulatory action as defined by EO 12866, and the EPA believes that the environmental health or safety risk addressed by this action has a disproportionate effect on children. Accordingly, the agency has evaluated the environmental health and welfare effects of climate change on children. GHGs, including methane, contribute to climate change and are emitted in significant quantities by the oil and gas industry. The EPA believes that the GHG emission reductions resulting from implementation of these proposed standards and guidelines, if finalize will further improve children's health. The assessment literature cited in the EPA's 2009 Endangerment Findings concluded that certain populations and life stages, including children, the elderly, and the poor, are most vulnerable to climate-related health effects. The assessment

literature since 2009 strengthens these conclusions by providing more detailed findings regarding these groups' vulnerabilities and the projected impacts they may experience. These assessments describe how children's unique physiological and developmental factors contribute to making them particularly vulnerable to climate change. Impacts to children are expected from heat waves, air pollution, infectious and waterborne illnesses, and mental health effects resulting from extreme weather events. In addition, children are among those especially susceptible to most allergic diseases, as well as health effects associated with heat waves, storms, and floods. Additional health concerns may arise in low income households, especially those with children, if climate change reduces food availability and increases prices, leading to food insecurity within households. More detailed information on the impacts of climate change to human health and welfare is provided in section III of this preamble.

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

This action, which is a significant regulatory action under Executive Order 12866, has a significant adverse effect on the supply, distribution or use of energy. To estimate the potential impacts of the proposed NSPS OOOOb and EG OOOOc on crude oil and natural gas production, the EPA developed a pair of single-market, static partial-equilibrium analyses of national crude oil and natural gas markets. These analyses are presented in the RIA for this action, which is in the public docket. We treat crude oil markets and natural gas markets separately in these models. The EPA estimated that the proposed rule could result in a maximum decrease in annual natural gas production of about 249 million Mcf in 2026 (or about 0.8 percent of natural gas production). We estimated the maximum annual reduction in crude oil production would be about 12.2 million barrels (or about 0.3 percent of crude oil production). Before 2026, the modeled market

impacts are much smaller than the 2026 impacts as only the incremental requirements under the proposed NSPS OOOOb are assumed to be in effect. As regulatory costs are projected to decline after 2026, the modelled market impacts for years after 2026 are smaller than the peaks estimated for 2026. As regulatory costs are projected to decline after 2026, the modelled market impacts for years after 2026 are smaller than the peaks estimated for 2026. The energy impacts the EPA estimates from these rules may be under- or over-estimates of the true energy impacts associated with this action. For more information on the estimated energy effects, please refer to the RIA for this rulemaking.

I. National Technology Transfer and Advancement Act (NTTAA)

This proposed action for NSPS OOOOb and EG OOOOc involves technical standards.[350] Therefore, the EPA conducted searches for the Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review through the Enhanced National Standards Systems Network (NSSN) Database managed by the American National Standards Institute (ANSI). Searches were conducted for EPA Methods 1, 1A, 2, 2A, 2C, 2D, 3A, 3B, 3C, 4, 6, 10, 15, 16, 16A, 18, 21, 22, and 25A of 40 CFR part 60 Appendix A. No applicable voluntary consensus standards were identified for EPA Methods 1A, 2A, 2D, 21, and 22 and none were brought to its attention in comments. All potential standards were reviewed to determine the practicality of the voluntary consensus standards (VCS) for this rule. Two VCS were identified as an acceptable alternative to EPA test methods for the purpose of this proposed rule. First, ANSI/ASME PTC 19–10–1981,

[350] The EPA is not proposing changes to previously conducted searches for 40 CFR part 60 subparts OOOO and OOOOa. Therefore, this section only describes proposed NSPS OOOOb and EG OOOOc standards and searches.

Flue and Exhaust Gas Analyses (Part 10) (manual portions only and not the instrumental portion) was identified to be used in lieu of EPA Methods 3B, 6, 6A, 6B, 15A and 16A. This standard includes manual and instructional methods of analysis for carbon dioxide, carbon monoxide, hydrogen sulfide, nitrogen oxides, oxygen, and sulfur dioxide. Second, ASTM D6420–99 (2010), ''Test Method for Determination of Gaseous Organic Compounds by Direct Interface Gas Chromatography/ Mass Spectrometry'' is an acceptable alternative to EPA Method 18 with the following caveats, only use when the target compounds are all known and the target compounds are all listed in ASTM D6420 as measurable. ASTM D6420 should never be specified as a total VOC Method. (ASTM D6420–99 (2010) is not incorporated by reference in 40 CFR part 60.) The search identified 19 VCS that were potentially applicable for this proposed rule in lieu of EPA reference methods. However, these have been determined to not be practical due to lack of equivalency, documentation, validation of data and other important technical and policy considerations. For additional information, please see the September 10, 2021, memo titled, ''Voluntary Consensus Standard Results for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review'' in the public docket. The EPA plans to propose the regulatory language for NSPS OOOOb and EG OOOOc through a supplemental action. At that time, the EPA will include any appropriate incorporation by reference in accordance with requirements of 1 CFR 51.5 as discussed below. The EPA anticipates that the following ten standards are incorporated by reference.

• ASTM D86–96, Distillation of Petroleum Products (Approved April 10, 1996) covers the distillation of natural gasolines, motor gasolines, aviation gasolines, aviation turbine fuels, special boiling point spirits, naphthas, white spirit, kerosines, gas oils, distillate fuel oils, and

similar petroleum products, utilizing either manual or automated equipment.

• ASTM D1945–03 (Reapproved 2010), Standard Test Method for Analysis of Natural Gas by Gas Chromatography covers the determination of the chemical composition of natural gases and similar gaseous mixtures within a certain range of composition. This test method may be abbreviated for the analysis of lean natural gases containing negligible amounts of hexanes and higher hydrocarbons, or for the determination of one or more components.

• ASTM D3588–98 (Reapproved 2003), Standard Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuel covers procedures for calculating heating value, relative density, and compressibility factor at base conditions for natural gas mixtures from compositional analysis. It applies to all common types of utility gaseous fuels.

• ASTM D4891–89 (Reapproved 2006), Standard Test Method for Heating Value of Gases in Natural Gas Range by Stoichiometric Combustion covers the determination of the heating value of natural gases and similar gaseous mixtures within a certain range of composition.

• ASTM D6522–00 (Reapproved December 2005), Standard Test Method for Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers, and Process Heaters Using Portable Analyzers covers the determination of nitrogen oxides, carbon monoxide, and oxygen concentrations in controlled and uncontrolled emissions from natural gas-fired reciprocating engines, combustion turbines, boilers, and process heaters.

• ASTM E168–92, General Techniques of Infrared Quantitative Analysis covers the techniques most often used in infrared quantitative analysis. Practices associated with the

collection and analysis of data on a computer are included as well as practices that do not use a computer.

• ASTM E169–93, General Techniques of Ultraviolet Quantitative Analysis (Approved May 15, 1993) provide general information on the techniques most often used in ultraviolet and visible quantitative analysis. The purpose is to render unnecessary the repetition of these descriptions of techniques in individual methods for quantitative analysis.

• ASTM E260–96, General Gas Chromatography Procedures (Approved April 10, 1996) is a general guide to the application of gas chromatography with packed columns for the separation and analysis of vaporizable or gaseous organic and inorganic mixtures and as a reference for the writing and reporting of gas chromatography methods.

• ASME/ANSI PTC 19.10–1981, Flue and Exhaust Gas Analyses [Part 10, Instruments and Apparatus] (Issued August 31, 1981) covers measuring the oxygen or carbon dioxide content of the exhaust gas.

• EPA–600/R–12/531, EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (Issued May 2012) is mandatory for certifying the calibration gases being used for the calibration and audit of ambient air quality analyzers and continuous emission monitors that are required by numerous parts of the CFR.

The EPA determined that the ASTM and ASME/ANSI standards, notwithstanding the age of the standards, are reasonably available because it they are available for purchase from the following addresses: American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, Post Office Box C700, West Conshohocken, PA 19428–2959; or ProQuest, 300 North Zeeb Road, Ann Arbor, MI 48106 and the American Society of Mechanical Engineers (ASME),

Three Park Avenue, New York, NY 10016–5990. The EPA determined that the EPA standard is reasonably available because it is publicly available through the EPA's Web site: http://nepis.epa.gov/Adobe/PDF/ P100EKJR.pdf.

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

The EPA believes that this action does not have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, and/or indigenous peoples, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994). The documentation for this decision is contained in the RIA prepared under EO 12866 for this proposal. In Section 4 of the RIA, the EPA presents a qualitative discussion of the climate impacts of GHGs and environmental justice. The section also presents a set of limited quantitative environmental justice analyses focused on the current distribution of VOC and HAP emissions from oil and natural gas sector. These analyses evaluated baseline scenarios and enabled us to characterize risks due to oil and natural gas VOC and HAP emissions prior to implementation of the proposed rule. These analyses potentially suggest that VOC and HAP emissions from the oil and natural gas sector may disproportionately impact vulnerable populations or overburdened communities under baseline scenarios; however, various uncertainties and data gaps remain, and should be taken into consideration when interpreting these results. Additionally, we lack key information that would be needed to characterize post-control risks under the proposed NSPS OOOOb and EG OOOOc or the regulatory alternatives analyzed in the RIA, preventing the EPA from analyzing spatially differentiated outcomes. While a definitive assessment of the impacts of this proposed rule on minority populations, low-income populations, and/or indigenous peoples was not performed, the EPA believes that this

action will achieve substantial methane, VOC, and HAP emission reductions and will further improve environmental justice community health and welfare. The EPA believes that any potential environmental justice populations that may experience disproportionate impacts in the baseline may realize disproportionate improvements in air quality resulting from emission reductions.

In addition, the EPA provided the public, including those communities disproportionately impacted by the burdens of pollution, opportunities for meaningful engagement with the EPA on this action. A summary of outreach activities conducted by the Agency and what we heard from communities is provided in section VI of this preamble.

List of Subjects in 40 CFR Part 60

Environmental protection, Administrative practice and procedure, Air pollution control, Reporting and recordkeeping requirements.

Michael S. Regan,

Administrator.

Message

From: EPA Office of Public Affairs [epa@BulletinIntelligence.com]
Sent: 11/2/2021 10:59:50 AM
To: Bulletin Intelligence [epa@bulletinintelligence.com]
Subject: EPA Daily News Clips for Tuesday, November 2, 2021

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United States Environmental Protection Agency

Daily News Clips: Brought to you by the Office of Public Affairs

November 2, 2021

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Administrator

New US Methane Regulation Plan Announced In Glasgow.

The **New York Times** (11/2, Friedman) reports the Biden Administration is expected to announce on Tuesday that it will "heavily regulate methane." The EPA "for the first time...intends to limit the methane coming from roughly one million existing oil and gas rigs across the United States." EPA Administrator Michael Regan said in a statement, "With this historic action, EPA is addressing existing sources from the oil and natural gas industry nationwide, in addition to updating rules for new sources, to ensure robust and lasting cuts in pollution across the country." Sen. John Barrasso (R-WY) in a statement called the White House plans "a recipe for disaster." The **AP** (11/2, Daly) reports the regulations were being announced Tuesday as President Joe Biden wraps up a two-day appearance at a United Nations climate summit in Glasgow, Scotland.

The **Washington Post** (11/2, Grandoni, Mufson) reports the EPA standards "could establish standards for old wells, impose more frequent and stringent leak monitoring, and require the capture of natural gas found alongside oil that is often released into the atmosphere." The **Wall Street Journal** (*Request Article*) (11/2) reports that by 2030, this rule is expected to save $690 million of worth from otherwise being wasted. **Reuters** (11/2) reports the rules "would slash methane from oil and gas operations by 74% from 2005 levels by 2035."

Bloomberg (11/2) reports that the EPA stopped short of imposing an outright ban on "routine, intentional flaring, when that excess natural gas is burned instead," which is a widespread issue in West Texas, New Mexico and other drilling hotspots where "the construction of gas pipelines hasn't kept up with

crude production." The omission "is set to disappoint activists who lobbied the EPA to follow the lead of some states that have barred flaring."

MarketWatch (11/2, Beals) reports the EPA "will be proposing a new methane rule that regulates leak detection. The action reverses the Trump administration's nullification of Obama administration efforts in this area and goes further, a senior Biden official said."

The **Washington Examiner** (11/2, Siegel) reports that the American Petroleum Institute and the Chamber of Commerce flipped positions earlier this year, endorsing the concept of the EPA imposing direct regulation of methane from new and existing oil and gas sources after supporting the Trump administration's elimination of such rules. However, "the devil is in the details on whether the industry will support the methane rules announced Tuesday."

The Hill (11/2, Frazin) reports the actions aimed at tackling methane include "regulatory actions...focused on the oil and gas sector – which is responsible for 30 percent of the country's methane emissions," while "agriculture, which is the largest contributor, is targeted through voluntary – not mandatory – actions." **NPR** (11/2, Brady), **CNN** (11/2, Nilsen) **NBC News** (11/2, Chow), **Axios** (11/2, Falconer) also provide coverage.

Administrator Regan With President At UN Summit.

Inside EPA (11/1) reports, "President Joe Biden, EPA Administrator Michael Regan and other top officials are Glasgow, Scotland, where they will be attending the latest round of the United Nations climate talks. Back in Washington, agency officials have a full agenda dealing with PCBs, PFAS and other issues. ... The two-week United Nations climate talks, known as the COP26 meeting, begins with a Nov. 1-2 'World Leaders Summit,' during which Biden and scores of other national leaders will offer high-level statements."

Regan Tweets He Has Faith In Coming Supreme Court Decision.

E&E Publishing (11/1, Clark, Farah, King) reports "the Supreme Court's stunning decision to review the scope of EPA's authority to limit emissions from power plants...sent shock waves through the legal world." White House National Climate Adviser Gina McCarthy "said yesterday that the administration believes the high court will uphold EPA's ability to regulate carbon emissions across the electricity sector." EPA Administrator Michael Regan "defended the agency's authority Friday on Twitter." Regan tweeted, "Power plant carbon pollution hurts families and communities, and threatens businesses and workers. The Courts have repeatedly upheld EPA's authority to regulate dangerous power plant carbon pollution."

E&E Publishing (11/1, Farah, King) and **E&E Publishing** (11/1, King) also report.

Opinion: Regan Puts People Before Profits.

In an op-ed in the **Charlotte (NC) Observer** (11/1), NC League of Conservation Voters Board of Directors President Elizabeth Redenbaugh says, "When you see a politician on TV it's easy to assume he's acting more in his own interest than ours. But that wasn't the case...when EPA Administrator Michael Regan returned to Raleigh and announced new rules to protect people from PFAS." In 2010, "my husband Jamie was diagnosed with...a rare pediatric disease." Doctors "believe it likely stemmed from a lifetime of drinking Wilmington's water." After decades "of deaf ears from Washington, Regan, an

eastern N.C. native, has heard us." Next year, "I'll only vote for leaders who care more about people than profit."

The **Raleigh (NC) News & Observer** (11/1) also carries the opinion piece.

Regan Tells NYT PFAS Transparency Necessary.

The **Leavenworth (KS) Times** (10/31, Bahl) reports, "There are over 9,000 sites" in Kansas "where PFAS use could have occurred, according to an inventory commissioned in 2019 by the Kansas Department of Health and Environment." EPA data "obtained by the watchdog group Public Employees for Environmental Responsibility earlier this month outlined thousands more potential sites." Last week, "the EPA announced more aggressive plans to regulate PFAS." EPA Administrator Michael Regan told The New York Times, "It could be expensive, but it's necessary. It's time for manufacturers to be transparent and provide the American people with this level of detail."

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Air

EPA Tells Appeals Court It Will Reassess Decision To Leave 2015 Ozone Standards In Place.

Reuters (11/1, Malo) reports the EPA "told the U.S. Court of Appeals for the D.C. Circuit in a court filing on Friday that it will initiate a rulemaking process to reassess, by the end of 2023" the Trump-era agency "decision to retain 2015 air-quality standards for ozone." A coalition "of more than a dozen state attorneys general led by New York petitioned the D.C. Circuit" in January "to seek judicial review of the EPA's decision," arguing that "the agency, by not bolstering the standards, had violated its obligation under the Clean Air Act to adequately protect the public's health."

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Climate Change

EPA Plans To Continue Power Plant Rulemaking As Supreme Court Prepares To Hear Case.

Inside EPA (11/1) reports, "Top Biden administration officials are signaling they plan to continue crafting strict EPA power plant rules even as the Supreme Court agrees to hear a case that could curb the agency's authority to broadly limit greenhouse gas emissions from the sector by barring it from regulating 'beyond the fenceline' of a particular plant to force generation shifting."

COP26 Summit Opens Monday With World Leaders Facing Divisions Over How To Curb Emissions.

The **Wall Street Journal** (*Request Article*) (11/1, Lucey, Hua) reports the COP26 summit opened Monday, a day after G-20 leaders meeting in Rome made little progress over the weekend agreeing on specific climate goals many anticipated would ease talks in Scotland. President Biden said the UN climate summit in Glasgow kicks off a crucial decade for fighting climate change, as world leaders confront large divisions over how to curb emissions quickly enough to prevent the most destructive effects of climate change. The **AP** (11/1, Knickmeyer, Miller, Boak) reports President Biden "treated the already visible crisis for the planet – flooding, volatile weather, droughts and wildfires – as a unique opportunity to reinvent the global economy." In his speech to world leaders in Glasgow, "he sought to portray the enormous costs of limiting carbon emissions as a chance to create jobs by transitioning to renewable energy and electric automobiles." The **New York Times** (11/1, Tankersley, Friedman, Sengupta) says, "The underlying tension of the summit is the stark disconnect between what the leaders of the biggest global warmers have so far promised and what scientists and civic leaders say must be done." **ABC News** (11/1, Jacobo) examines "how some of the world's largest greenhouse gases emitters are faring" on climate goals. **Axios** (11/1, Freedman, Geman) says the difficulties present in the G-20 talks are likely a preview of what's to come in Glasgow.

Biden Seeks To Reassure World Leaders That US Is Ready To Lead On Climate. **Bloomberg** (11/1, Sink, Dlouhy) reports President Biden "said the U.S. is ready to be a leader again in the fight against climate change" despite "offering no new plans to step up his country's ambitions and continued discord at home over his proposal to spend hundreds of billions advancing clean energy." Biden said in a speech to the summit on Monday that his administration will "demonstrate to the world the United States is not only back at the table, hopefully leading by the power of our example." **Bloomberg** (11/1) reports Biden "wants $3 billion a year of U.S. climate finance to go toward helping vulnerable nations adapt to rising seas, droughts and other consequences of global warming." His pledge "is meant to be another demonstration of renewed U.S. commitment to countering climate change." But, **NPR** (11/1) says, his "struggles to get his plan through Congress may undercut U.S. influence" at the global climate summit. **NPR** (11/1) correspondent Ari Shapiro interviewed US Agency for International Development Administrator Samantha Power "about commitments to addressing climate change in light of the COP26 Conference."

World Leaders Emphasize Urgency Of Climate Crisis At COP26. The **AP** (11/1, Borenstein) reports, "World leaders turned up the heat and resorted to end-of-the-world rhetoric Monday in an attempt to bring new urgency to sputtering international climate negotiations." British Prime Minister Boris Johnson, for example, "described global warming as 'a doomsday device' strapped to humanity." UN Secretary-General António Guterres "told his colleagues that humans are 'digging our own graves.'" Indian Prime Minister Narendra Modi, meanwhile, "said his coal-dependent country will aim to stop adding greenhouse gases to the atmosphere by 2070 – two decades after the United States and at least 10 years later than China." The **AP** (11/1) reports Queen Elizabeth II said in a pre-recorded video message that "the time for words has now moved to the time for action." **CNBC** (11/1, Frangoul) reports Prince Charles "issued an urgent call for action at the opening ceremony of COP26 on Monday, telling those attending the climate change summit that time had 'quite literally run out.'" The **Canadian Press** (11/1) says Canadian Prime Minister Justin Trudeau "called for global action in the fight against climate change and formally committed to a cap on emissions produced by Canada's oil and gas sector."

Bloomberg (11/1) reports Brazil "is set to unveil a more ambitious net-zero target and sign a U.K.-led pledge on ending deforestation in a stark turnaround for the administration of climate-skeptic President Jair Bolsonaro." **Bloomberg** (11/1), **NPR** (11/1, Neuman) and the **Ottawa (CAN) Citizen** (11/1) carry further coverage.

Biden Commits To Cutting Greenhouse Emissions, Apologizes For Past US Inaction On Climate Change.

Reuters (11/1, Mason) reports that President Biden "told world leaders on Monday the United States would meet its pledge to cut greenhouse gas emissions 50-52 percent by 2030 compared to 2005 levels and said the world must help developing nations more to deal with climate change." He said, "Right now we're still falling short."

The **AP** (11/1, Knickmeyer, Miller, Boak) reports that "Biden acknowledged at a U.N. summit Monday that the United States and other developed nations bore much of the responsibility for climate change, and said actions taken this decade to contain global warming will be decisive in preventing future generations from suffering." Biden "also apologized for former President Donald Trump's decision to leave the Paris Agreement and the role the U.S. and other wealthy countries played in contributing to climate change." He said, "Those of us who are responsible for much of the deforestation and all of the problems we have so far," have "overwhelming obligations" to the poorer nations that account for few of the emissions yet are paying a price as the planet has grown hotter. As for Trump's action, he said, "I shouldn't apologize, but I do apologize for the fact the United States, the last administration, pulled out of the Paris Accords and put us sort of behind the eight ball a little bit."

CNBC (11/1, Meredith) reports on its website that Biden said, "This is the challenge of our collective lifetimes, the existential threat to human existence as we know it and every day we delay, the cost of inaction increases. So, let this be the moment when we answer history's call here in Glasgow. Let this be the start of a decade of transformative action." Biden "said the U.S. was committed to reducing greenhouse gas emissions by 50% to 52% by 2030 when compared to 2005 levels." Biden said this was designed "to demonstrate to the world the United States is not only back at the table, but hopefully leading by the power of our example. I know it hasn't been the case and that's why my administration is working overtime to show that our climate commitment is action, not words."

Politico (11/1, Niedzwiadek) reports that "hours earlier the White House released a 65-page document outlining the Biden administration's strategy to cut domestic greenhouse gas pollution in half over this decade and reach net-zero emissions by 2050."

The **New York Times** (11/1, Sengupta, Friedman, Santora) reports that Biden "touted the potential emissions reductions in a sweeping spending bill that Democrats are hoping to pass through the House and Senate soon, but which still has uncertain prospects to make it to Mr. Biden's desk." Biden "also did not call out China – as his national security adviser did earlier in the day – for insufficient action on emissions reduction" but, instead, "called for global cooperation."

ABC's Good Morning America (11/1) reported earlier that Biden "needs to convince the other countries that America can actually lead on climate." **CBS This Morning** (11/1) reported earlier that Biden had "argued his personal relationships with other world leaders allowed them to make tangible progress at the G20 summit in Rome." He said, "We passed a number of things here to end the subsidization from coal. we made agreements all of us in terms of what we're going to bring to COP26."

NBC's Today (11/1) reported that Biden "says he's disappointed the leaders of Russia and China, two of the world's biggest polluters did not attend the G20 and are not traveling to Glasgow, either."

British Ambassador to the US Karien Pierce told **MSNBC's Morning Joe** (11/1), "The US is back on the world's stage. We have an important agenda, open markets and it's very good to have American leadership again. As for the package, anyone knows it's not straightforward but we have been very admiring of what the President has managed to do so far on rescue and post COVID recovery. We are hoping to be able to build on that at the summit."

Asia Leads World In New Coal Plant Construction As COP26 Leaders Seek Transition Away From Energy Source. **Reuters** (11/1) reports that, "in Asia, home to 60% of the world's population and about half of global manufacturing, coal's use is growing rather than shrinking as rapidly developing countries seek to meet booming demand for power." Most of the 195 coal plants under construction around the world are in Asia, according to data from US nonprofit Global Energy Monitor. CNBC says "this new fleet will produce planet-warming emissions for decades and is a measure of the challenge world leaders face when they meet for climate talks in Glasgow, where they hope to sound the death knell for coal as a source of power."

Kerry Looking Toward Further Commitments Post-COP26. The **New York Times** (11/1, Friedman) reports that "John Kerry, who helped clinch the Paris climate agreement in 2015 as secretary of state and who came out of retirement to become President Biden's climate envoy, arrives on Monday with a carefully crafted message for the United Nations summit: It is critically important but not the last chance for action." He said recently, "Glasgow was never going to be, you know, the definitive one meeting." However, "that is in contrast to Mr. Kerry's comments last month, when he described the summit as 'the last best hope' to reduce greenhouse gas emissions enough to avert the worst consequences of climate change." Kerry "noted that when Mr. Biden took office few countries had committed to targets that keep 1.5 degrees in reach." He said, "We have pushed and cajoled and negotiated with countless countries," and now nations representing about 65% of the global economic output have ambitious targets for the coming decade.

BCG: Only 11% Of Companies Hitting Their Emissions Goals.

Fortune (11/1) shares findings from BCG's Carbon Measurement Survey. While 85% of surveyed organizations say they're concerned about reducing their emissions, just 11% say they are meeting their goals. Only 9% are able to measure their emissions "comprehensively." Some 48% say an AI-based automated footprint calculation would help them get to the next level when it comes to cutting emissions.

Latest Version of Methane Fee Proposal Relaxes Fee Structure, Provides Mitigation Incentives.

S&P Global Market Intelligence (11/1, Paul) reports the most recent iteration of a proposed federal fee on methane emissions has done little to "assuage industry groups that oppose the concept, but analysts said it could be a critical tool for curbing planet-warming emissions to meet mid-century climate targets." As of October 28, the methane fee proposal included in Congress' budget reconciliation package "would still expand the number of companies required to report emissions data to federal regulators and potentially subject them to millions of dollars in annual fines, starting with emissions reported in 2023." However, "the methane fee that would be imposed on eligible oil and gas companies would start at a lower amount in the first year and ratchet up through 2025." The bill would also "provide an additional

$775 million in incentives that could be tapped by operators for investments in monitoring and mitigation." **Roll Call** (11/1, Morton) reports House Democrats hope "their latest version of a methane fee in the budget reconciliation package reflects enough concessions to win over skeptical members within their own ranks and garner," meaning Sen. Joe Manchin. Roll Call says "proponents were referring to the tweaked provisions as a 'penalty' for companies that fail to address methane waste rather than a 'fee.' ... Nomenclature aside, the new language still would require oil and gas companies to pay a per-ton amount for the methane that escapes from their operations and enters the atmosphere."

More Sign On To Global Methane Pledge, But Russia, China, Brazil Hold Off.

Bloomberg (11/1, Ainger, Dlouhy, Shankleman) reported the Global Methane Pledge had secured the support of 80 countries as of mid-morning Monday in Glasgow, where the 2021 UN Climate Change Conference (COP26) is taking place. That figure is up by 20 over the past week, but "key countries" who have yet to sign on include Russia, China, and Brazil. **Bloomberg** (11/1) reports the major holdouts combined "generate about a third of [global] methane emissions." Russia has shown "some interest in a global effort to address the methane issue, according to the US, and it emphasized that the new Nord Stream 2 gas pipeline to Germany will be one of the cleanest ever."

Krupp: Carbon Markets A Cost-Effective Way To Cut Methane Emissions. In an op-ed for the **Wall Street Journal** (*Request Article*) (11/1, Krupp), Environmental Defense Fund President Fred Krupp says cutting methane emissions – not carbon emissions – is the most effective way to slow the rate of near-term global warming. The most cost-effective means to reduce methane emissions is through carbon markets, Krupp says.

US EIA Says 79% Of New Cars Will Require Liquid Fuels In 2050.

PolitiFact (11/1, Martin, Muller) reports President Biden "on Oct. 5...said, 'the whole world knows that the future of the auto industry is electric.'" Rep. Randy Feenstra (R-IA) responded in a tweet, "no it's not – in fact, your own administration published a study concluding 4/5 new cars on the road by 2050 will still require liquid fuels." Feenstra's information was confirmed to come from the US Energy Information Administration's 2021 Annual Energy Outlook.

ExxonMobil Low Carbon Solutions President Discusses Houston Ship Channel Carbon Capture Hub Proposal.

The **AP** (11/1, Bussewitz) reports that in an interview, ExxonMobil President of Low Carbon Solutions Joe Blommaert discussed the company's proposal for the oil and natural gas industry and the government to jointly raise $100 billion to construct a carbon capture and storage (CCS) hub at the Houston Ship Channel. Blommaert "says CCS is essential to meeting the goals of the Paris agreement while also meeting the growing energy needs of the world." He said the scale of the Houston Ship Channel proposal "is unprecedented. When you look into the details, actually, it is many capture facilities and storage facilities, and actually this CCS is executed at scale already around the world." Blommaert added, "What is important in my mind is this collaboration of the whole industry, the whole of government and the whole of society. And it is actually addressing climate change, which technically is a very complicated issue."

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Editorial/Op Ed/ Commentary/Letters

Rampell: Carbon Tax Is Best Climate Mitigation Tool At Our Disposal.

Washington Post (11/1) contributor Catherine Rampell says the best climate mitigation tool would be a carbon tax that would harness market forces to "nudge businesses and consumers away from carbon-intensive technologies," while also "incentivizing investors and entrepreneurs to develop new, lower- or zero-carbon alternatives since they know customers will demand them." She notes that over 3,600 US economists have already endorsed a carbon tax-and-dividend scheme, and that the Business Roundtable and American Petroleum Institute also support carbon taxes.

Sargen: US Should Address Climate Change By Adopting A Carbon Tax. **Forbes** (11/1) contributor Nick Sargen says the US should address climate change by adopting a carbon tax rather than by implementing more climate regulations. Sargen says a carbon tax "makes the cost of tackling climate change transparent, which is what makes it efficient but also what garners opposition to it. By comparison, regulations are not transparent, which makes them harder to calculate the costs and the distortions they create."

Franta: Oil And Gas Industry Carried Out Confidential Research On Climate Change For Decades.

In a commentary for **The Conversation** (11/1), Climate Social Science Network Director of Accountability Research Benjamin Franta discusses his research into oil major corporate documents on climate change from the past six decades. He found that fossil fuel executives had been warned of global warming at least as far back as a Columbia University symposium in 1959. ExxonMobil and the API had done research in the 1970s and 1980s on climate change which they kept secret, while in 1986 "Shell finished an internal report nearly 100 pages long, predicting...global warming from fossil fuels" that would be hugely destructive. Franta concludes that the fossil fuel industry had researched ways to avoid global warming through alternate energy sources, and so the current state of the world was a choice.

Eberhart: Biden Climate Agenda Ignores Free Market.

Forbes (11/1, Eberhart) contributor Dan Eberhart writes that President Biden "is touting a $1.75 trillion framework for climate and social reforms in the Democrats' budget reconciliation bill as he attends the UN climate talks in Glasgow this week." But his progressive agenda "ignores the fact that American consumers, not the federal government, are the best stewards of the economy." Eberhart argues that "consumers, not elected officials or bureaucrats, should drive investment, production, and buying decisions."

Morrison: Businesses Can't Follow Through With Climate Goals Until Politicians Make Them Mandatory.

In an op-ed for **Fortune** (11/1), Competitive Enterprise Institute research fellow Richard Morrison argues that "advocates of environmental, social, and governance (ESG) investing seem to have good reason to

be optimistic these days." But much of this optimism "is built on the idea that public policy changes will soon shift ESG goals from voluntary to mandatory." That assumption, he argues, "has a shaky basis," as "the kind of U.S. climate policies that companies supposedly need to accommodate have been slow to materialize."

Berman: ESG Will Be Costly Unless Consumers Decide To Support Companies Invested In It. In a column for **BNN Bloomberg (CAN)** (11/1), Larry Berman says "ESG investing will be a big focus in the coming years." He argues that ESG "will eat into profit margins" unless the consumer "votes that they will support companies that are more ESG focused and possibly pay a bit more for them." Berman writes, "Some companies are making that bet and other are not. ESG focused investing over the past 20-years has not shown much in the way of additional return, but that trend may be changing."

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Energy Issues

Biden Faces Scrutiny For Encouraging Rapid Energy Transition After Asking OPEC To Increase Output.

The **New York Times** (11/1, Tankersley, Friedman) reports President Biden is facing questions about his stance on fossil fuel production and the energy transition. At COP26, Biden on Monday warned that "we have only a brief window before us" to reduce GHG emissions, while days before he was calling on OPEC+ to increase fossil fuel production to protect the post-pandemic economic recovery. Speaking on the matter, Biden said, "On the surface, it seems like an irony. But the truth of the matter is – you've all known; everyone knows – that the idea we're going to be able to move to renewable energy overnight" is not a rational idea. Despite this explanation, energy experts and climate activists are criticizing Biden, arguing that the world cannot afford increases in fossil fuel production if catastrophic warming is to be avoided.

The **Washington Times** (11/1, Richardson) reports the US Special Envoy for Climate Change John Kerry "insisted there was 'no inconsistency' between the administration's aggressive climate change position and Mr. Biden's effort to persuade OPEC and Russia to open up supply amid a global energy crisis," arguing the production increase Biden is asking for only "this immediate moment." Biden, meanwhile, called for governments to stop subsidizing fossil fuels although use of fossil fuels won't stop immediately. Some fossil fuel trade groups have also criticized Biden's remarks as hypocritical, pointing to what they call the negative impact of his policies on fossil fuel companies and employment domestically.

Reuters (11/1) provided video of Biden's comments defending his position.

Bipartisan Group Of Senators Propose Hydrogen Infrastructure Bills.

Natural Gas Intelligence (11/1, Veazey) reports a bipartisan group of senators – including Sens. John Cornyn (R-TX), Chris Coons (D-DE), Bill Cassidy (R-LA), Martin Heinrich (D-NM), and Ben Ray Luján (D-NM) – introduced three bills last week that are intended to support the development of infrastructure

for hydrogen energy. Cornyn said, "Hydrogen is a versatile energy source, but we lack the infrastructure to reap its benefits for a wide range of industries. ... This legislation would help make hydrogen more accessible and cost-effective as businesses and consumers can utilize this reliable energy resource." Coons said, "Hydrogen deployment in emissions-intensive sectors, such as steel production and shipping, offers the potential to substantially reduce greenhouse gas emissions and improve air quality, all while maintaining energy and economic security."

NY Regulators Deny Permits For Proposed Gas-Fired Plants.

Natural Gas Intelligence (11/1, Baker) reports in continuing coverage that New York state regulators "last week announced they had denied required air permits for two proposed natural gas-fired power plants as the projects did not align with the state's environmental goals." New York Department of Environmental Conservation Commissioner Basil Seggos "said the 437 MW Astoria Replacement Project and the 536 MW Danskammer Energy Center project do not 'demonstrate compliance with the requirements of the Climate Leadership and Community Protection Act,' aka the Climate Act."

Xcel Energy Announces Natural Gas System Net-Zero Goal.

The **Minneapolis Star Tribune** (11/1, Hughlett) reports Xcel Energy announced Monday that it is aiming to transition is natural gas system to net-zero carbon emissions by 2050. Xcel CEO Bob Frenzel said, "It is really an evolution from the company's perspective. ... This is just the next big sector of the economy where we can provide leadership in reducing emissions." Frenzel added, "We are going to limit the amount of greenhouse gas emissions (from gas) as much as possible. ... We are not going to do anything that jeopardizes the reliability of the system or affordability of the product." The company's plan for reaching net-zero "starts with measures that can be taken soon, notably by ramping up efforts to detect and stop leaks on its distribution system; and through purchasing gas only from suppliers with 'certified low emissions.'" Xcel "also plans to launch pilot programs to test both 'green' hydrogen and renewable natural gas...in its gas delivery system."

The **Denver Post** (11/1, Kohler) reports Xcel officials also "said Monday that the goal builds on its goal announced in 2018 to deliver carbon-free electricity by mid-century."

Biden Administration Initiative Would Reduce Cost Of Producing Green Hydrogen.

University of Houston Energy Fellows report in **Forbes** (11/1) that "the U.S. produces and consumes about 10 million metric tons of hydrogen each year, but less than 1% of it comes from green hydrogen made from the electrolysis process." A roadblock to green hydrogen production is "the intensive amount of resources required to make it," although "technology is advancing, and the Biden administration has an initiative to reduce the cost of clean hydrogen by 80% to $1 per 1 kilogram within a decade."

Records Show Enbridge Has Contributed To Account Used To Pay Police Expenses Related To Line 3 Construction.

ABC News (11/1, Kim, Simon, Lefferman, Pitts) reports Enbridge "has paid more than $2.9 million for Minnesota law enforcement and public safety organization expenses related to the company's controversial Line 3 oil pipeline through a state-managed escrow account, according to documents obtained by ABC News through public records requests." Enbridge Chief Communications Officer Mike

Fernandez said the escrow account was created by the Minnesota Public Utility Commission and the company was asked to contribute money. Fernandez said, "We make no judgments about how that money is spent. It was a condition of us actually getting the permit in order to operate." He added, "The judgments are all made by professionals in the state of Minnesota that have law enforcement backgrounds, and they are the ones that make judgments on the specific payments."

BLM Says 195 Parcels Of WY Land Can Be Included In Federal Oil And Gas Lease Sale.

The **Casper (WY) Star-Tribune** (11/1, Pollack) reports the BLM said Monday that 195 of 459 parcels of land in Wyoming that were proposed for inclusion in the federal oil and natural gas lease sale during Q1 2022 are eligible for inclusion in the sale. After reviewing "public comment and completing an environmental assessment for the state's nominated lands, the agency deferred 264 Wyoming parcels from the sale, largely due to concerns about disturbing priority sage grouse habitat." In a "separate announcement Friday, the BLM also cited 'insufficient environmental analysis' as a reason for deferring some parcels."

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Science

Fort Worth Attorney Working To Establish Environmental Museum.

The **Fort Worth (TX) Star-Telegram** (11/1, Samsel) reports Fort Worth-based attorney Joseph Horn is working with community leaders and environmental experts in the area to develop the proposed International Environmental Complex, which would be the US' first environmental museum and center for innovation.

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HQ Amplification

Survey Reveals Scientific Integrity Lapses In Trump Era.

Bloomberg BNA (11/2, Lee) reports the EPA released survey data Monday that show "nearly one in six EPA staffers who responded to a survey say they still have allegations about lapses in scientific integrity during the Trump era that they haven't reported." EPA Scientific Integrity Officer Francesca Grifo "said she didn't find those results especially surprising."

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Toxics

EPA GenX Assessment Approach Could Apply To PFOA, PFOS.

Inside EPA (11/1) reports, "EPA's risk assessment of GenX, a widely used per- and polyfluoroalkyl substance (PFAS), adopts an approach that observers say could also support tough limits on the more widely-studied PFAS known as PFOA and PFOS – which one environmentalist says 'could have enormous implications' as EPA is already considering new assessments for them."

Latest IRIS Timeline Has Details of Formaldehyde, PFAS Assessment Releases.

Inside EPA (11/1) reports, "EPA's latest agenda outlook for its Integrated Risk Information System (IRIS) program gives new details on when it expects to release drafts of several hotly-anticipated assessments, such as those of formaldehyde, a handful of perfluorinated chemicals, arsenic, mercury and chloroform – the last of which trials a new approach to dose-response analysis."

Environmental Coalition Critical Of EPA TSCA Strategy.

Inside EPA (11/1) reports, "The coalition of environmental groups petitioning EPA to mandate toxicity testing for 54 per- and polyfluoroalkyl substances (PFAS) found in North Carolina is criticizing the agency's new TSCA testing strategy for the chemicals, saying that the plan is limited, ineffective and no substitute for granting their petition."

Industry Lawyers Downplay EPA Decision To Address PFAS Under RCRA.

Inside EPA (11/1) reports, "Industry attorneys are generally downplaying any significant near-term impacts from EPA's recent decision to eventually address per- and polyfluoroalkyl substances (PFAS) under the Resource Conservation & Recovery Act (RCRA), pointing to the deliberative process the agency will follow and its faster plan to address some of the chemicals under the Superfund law."

BOSC To Hold PFAS Webinar.

Inside EPA (11/1) reports, "Members of EPA's agency-wide council on per- and polyfluoroalkyl substances (PFAS) will discuss their new 'roadmap' for addressing the chemicals on a webinar this week, after unveiling a slate of new targets for action under TSCA and other statutes. The EPA Board of Scientific Counselors (BOSC) will meet to begin its latest cycle of reviewing the agency's chemical safety research program."

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Water

FERC Asks Court Not To Find Exceptions To CWA Limit For States.

Inside EPA (11/1) reports, "The Federal Energy Regulatory Commission (FERC) is urging a federal appeals court to reject efforts from California and environmentalists to find exceptions to a one-year Clean Water Act (CWA) limit for states to act on requests for water quality certifications, arguing the efforts are contrary to congressional intent and judicial precedent."

Court Vacates EPA 2019 Pebble Mine Decision.

Bloomberg BNA (11/1, Earls) reports the US District Court for the District of Alaska on Oct. 29 vacated the EPA's action that "withdrew an Obama-era determination that proposed limits for" the Pebble Mine "under the Clean Water Act in 2019." The EPA "can take a second look at its decision" with no time limits in "a win for environmental and tribal groups."

Petition Congress For Lead Pipe Removal Funding.

One Green Planet (11/1, Gleckel) reports that, according to the EPA, "lead pipes, faucets, and fixtures are the most common sources of lead in drinking water." Federal funding "is both important and necessary to help solve the lead crisis." A link is provided to a "petition urging Congress to dedicate more funds towards removing lead pipes."

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Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 11/2/2021 11:14:46 AM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]; Shaw, Betsy [Shaw.Betsy@epa.gov]; Millett, John [Millett.John@epa.gov]; DeLuca, Isabel [DeLuca.Isabel@epa.gov]; Shoaff, John [Shoaff.John@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]; Kabanda, Thierry [Kabanda.Thierry@epa.gov]
Subject: FOR YOUR REVIEW: OAR Weekly Report

Please find below, OAR's report for the week ending November 5, 2021, for your review. Light week ☺ unless anyone has an update on timing for the RFS/SRE, MATS, or the HDV submission. I intend to include LDV in next week's report but we could start messaging on that now.

Ex. 5 Deliberative Process (DP)

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: Kim, Eunjung [Kim.Eun@epa.gov]
Sent: 11/2/2021 10:05:47 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]
Subject: READING: Materials for Wednesday, November 3rd, 2021
Attachments: 2021 11 03 Options Seletion Ozone Transport - Decision Memo.docx; 2021 11 03 Options Seletion Ozone Transport - Slides.pptx; 2021 11 03 Options Seletion Ozone Transport - Briefing Memo.docx; 1 pager on the power sector for Joe's NGO meeting tomorrow

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Wednesday, November 3, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

November 2021

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

November 2021

Wed, Nov 3

	Before 8:00 AM	**Free**
	8:00 AM – 8:30 AM	**Free**
	8:30 AM – 9:00 AM	Travel Security Briefing
	9:00 AM – 9:15 AM	**Free**
	9:15 AM – 10:15 AM	Video-call: Options Selection for 2015 Ozone Transport Rule; NPRM (SAN 8670) (2 docs & 1 ppt)
	10:15 AM – 10:40 AM	Management Roundtable
	10:40 AM – 11:00 AM	One-on-One with Sarah Dunham
	11:00 AM – 11:30 AM	Weekly EPA/OIRA check-in
	11:30 AM – 12:00 PM	Air Issues Meeting
	12:00 PM – 12:30 PM	End of Year Performance Review - Sarah Dunham

■	12:30 PM – 1:15 PM	NGO Roundtable (1 email)
□	**1:15 PM – 1:30 PM**	**Free**
■	1:30 PM – 2:00 PM	One-on-One with Jon Edwards
■	2:00 PM – 2:55 PM	Quarterly OAR/RAs/ADDs Call
□	**2:55 PM – 3:00 PM**	**Free**
■	3:00 PM – 3:30 PM	OAR Implementation Support
□	**3:30 PM – 3:45 PM**	**Free**
■	3:45 PM – 4:05 PM	Weekly w/Joe Goffman
■	4:00 PM – 4:30 PM	Meeting with Auto Innovators re: GHG Comments
■	4:30 PM – 5:00 PM	Bi-weekly Oil and Natural Gas (O&G) Sector Meeting
□	**After 5:00 PM**	**Free**

Eunjung Kim
Special Assistant
Office of Air and Radiation
Environmental Protection Agency
(202) 815-7252

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 11/2/2021 10:36:35 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
Subject: FOR YOUR REVIEW
Attachments: PARS Summary Narratives_SES.docx

Joe, as discussed please find a working draft for your feedback. This includes all the SES but for Steve. Some additional massaging may be important wrt the managing people aspect of their performance review and I think acknowledging the importance of building on the work already underway to fully incorporate EJ into the programs' work in 2022. Thoughts on this or additional feedback on the draft?

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: EPA Office of Public Affairs [epa@BulletinIntelligence.com]
Sent: 11/3/2021 11:01:52 AM
To: Bulletin Intelligence [epa@bulletinintelligence.com]
Subject: EPA Daily News Clips for Wednesday, November 3, 2021

Click to access mobile-optimized online version, including download options and an audio reader.

produced by CISION insights

United States Environmental Protection Agency

Daily News Clips: Brought to you by the Office of Public Affairs

November 3, 2021

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• Global Carbon Council Expected To Issue Carbon Credits In Coming Months. (S&P Global Platts)
• Pembina Wants To Join Forces With Shell, Others On Alberta Carbon Capture Plan. (Reuters)

Energy Issues

• CA Democrats Decide Not To Vote On Whether To Stop Accepting Contributions From Fossil Fuel Companies. (Sacramento Bee)
• Disclosure Reports Show Former Manchin Aides Lobbied For Energy Industries. (CNBC)
• Environmental Group Calls For Federal Review Of Offshore Drilling Operations Involved In CA Oil Spill. (NBC News)
• House Committee Subpoenas Leading Oil And Gas Companies, API And Chamber. (Reuters)
• ME Votes No On New England Clean Energy Connect Referendum. (AP)
• Newsom's Administration Weighs Cuts To Solar Incentive Program. (Los Angeles Times)
• Renewable Energy Developer Scales Back Plans Fro Solar Farm In Copake, NY. (New York Times)
• Biden Administration Plans To Move Forward With Federal Oil And Gas Lease Sales In US West. (AP)
• CVR Energy Considering Spinoff Of Renewable Fuel Business. (Bloomberg)
• Army Corps Of Engineers Holds Hearing For Mountain Valley Pipeline Permit. (Charleston Gazette-Mail)

Toxics

• EPA Staff Find Data Gap On PFAS In Breast Milk. (Inside EPA)
• DOD Official Says PFAS Cleanups May Not Accelerate With Funding Boost. (Inside EPA)
• EPA Rule Requires Broader Reporting Of Mercury In Imports. (Bloomberg BNA)

ESG

• Campaign To Divest From Oil Companies Gains Support. (CleanTechnica)
• Top 10 Global Mining Industry Sustainable Brands Listed. (Mining Global)

Administrator

EPA Proposes Stricter New Methane Regulations For Oil, Gas Industry.

S&P Global Platts (11/2) reports that the Biden Administration unveiled stricter new methane regulations for the oil and gas industry that will require "increased emissions monitoring on new wells and bring nearly 700,000 older wells into compliance at an estimated industry cost of $1.2 billion/year."

Bloomberg (11/2) reports that the regulations could reduce oil and gas output by forcing non-compliant wells to be shutdown. The EPA says the impact would be minimal, resulting in a "6-cents-per-barrel increase while gas would inch higher by a nickel for every thousands cubic feet." **Natural Gas Intelligence** (11/2) reports the EPA says the proposed regulation "builds on the work of leading companies that are using the latest cost-effective technology to reduce methane emissions in the field." "As global leaders convene at this pivotal moment in Glasgow for COP26, it is now abundantly clear that America is back and leading by example in confronting the climate crisis with bold ambition," said EPA Administrator Michael Regan.

The **AP** (11/2) reports that the centerpiece of US actions announced at the United Nations climate summit is the "long-awaited rule" by the EPA to tighten methane regulations. Said EPA Administrator Michael Regan, this "historic action" will "ensure robust and lasting cuts in pollution across the country." **BBC News** (11/2) reports, "The timing of this is critical," EPA Administrator Michael Regan told Reuters news agency, adding: "As we speak, world leaders are gathering right now in Glasgow and they are looking to the United States for true leadership. This proposal is absolutely bold, aggressive and comprehensive."

Reuters (11/2) reports that BP Plc said it applauded the EPA proposals, while the American Lung Association said the proposal was a good start but the EPA needs to "set stronger limits and finalize them into law without delay". Some have taken issue with the fact that the EPA's well monitoring proposal "applies only to sites emitting an estimated three tons of methane per year or more," which the agency said would capture sites responsible for 86% of leaks.

Bloomberg (11/2) reports that the regulations could reduce oil and gas output by forcing non-compliant wells to be shutdown. The EPA says the impact would be minimal, resulting in a "6-cents-per-barrel increase while gas would inch higher by a nickel for every thousands cubic feet."

Additional coverage provided by the **Washington Times** (11/2, Mordock), **Los Angeles Times** (11/1), **The Hill** (11/2, Frazin), **Ars Technica** (11/2), **Bismarck (ND) Tribune** (11/2), **Washington Examiner** (11/2, Siegel), **CBS News** (11/2), **Texas Tribune** (11/2), **Inside EPA** (11/2), **E&E Publishing** (11/2), **Inside EPA** (11/2), **E&E Publishing** (11/2), **Bloomberg BNA** (11/2), and **Grist** (11/2, Pontecorvo).

Regan Talks About Methane On NPR.

NPR (11/2, Louise Kelly, Levitt, Kenin, Mehta) features a 4-minute interview with EPA Administrator Michael Regan on "the administration's newly announced plans at the COP26 climate conference to

curb methane emissions." Regan said, "We've heard from the industry that there needs to be some rules of engagement. So we're actually building the innovation from across the oil and gas industry that will help spur new solutions to reduce pollution using advanced technologies and save on costs."

EPA Orders Benton Harbor To Take Action On Drinking Water.

The **Detroit Free Press** (11/2, Matheny) reports the EPA on Tuesday ordered Benton Harbor, MI to "take immediate actions to improve the safety and reliability of its lead-tainted drinking water." EPA Administrator Michael Regan said in a statement, "The people of Benton Harbor have suffered for too long. EPA is fully engaged and working to support the community, and today, we are taking a critical next step to ensure that drinking water is safe and reliable." State and local officials "continue to provide Benton Harbor residents with bottled water, and have embarked on a $30 million project intended to replace the city's thousands of lead service lines within 18 months." In September, 30 environmental and community organizations "appealed to the EPA to intervene in Benton Harbor as the lead problems languished."

The **AP** (11/2), **CNN** (11/3, Westhoff, Romine), and **Newsweek** (11/2, Ellington) also report.

EPA Continues Emissions Rulemaking As It Awaits Supreme Court Decision.

E&E Publishing (11/2, Chemnick, King) reports the EPA "said it is still working on new power plant carbon rules, despite a move by the Supreme Court last week that could have repercussions for the kind of regulation that would ultimately pass legal muster." EPA Administrator Michael Regan said Monday, "EPA will continue to move forward and use its statutory authority to be sure that we protect the public from harmful pollution, greenhouse gas pollution and pollution that contributes to the degradation of air quality," even as the justices consider the scope of authority the agency has under the Clean Air Act to promulgate such rules. Former EPA Official Jeff Holmstead said, "There are other upcoming rules for conventional pollutants that may indirectly reduce carbon emissions, and I'm sure that EPA is moving forward with those."

Roll Call (11/2, Hulac) and **Reuters** (11/2, Volcovici) also report.

NC Sues Colonial Pipeline For Gasoline Spill.

The **AP** (11/2) reports the NC Department of Environmental Quality said it filed a lawsuit "in Mecklenburg County Superior Court on Monday to force Colonial 'to meet their obligations as the responsible party in the state's largest gasoline spill.'" In September 2020, Michael Regan, "then-secretary of the NCDEQ, said 273,000 gallons (1.033 million liters) of gasoline spilled in Mecklenburg County's Oehler Nature Preserve near Huntersville."

The **Charlotte (NC) Observer** (11/2, Limehouse) also reports.

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Budget/Recovery Act

EPA Preparing Recycling Grants Programs In Case Funding Passes.

Inside EPA (11/2) reports, "EPA is ramping up its preparation to create new recycling grant and funding programs and bolster its upcoming National Recycling Strategy in the event congressional leaders and the White House can reach a deal on the programs in pending infrastructure and spending legislation. Both the bipartisan, Senate-passed infrastructure bill and pending appropriations legislation 'are contemplating' a significant amount of funding for recycling-related programs at EPA, Nena Shaw, acting director of EPA's Resource Conservation and Sustainability Division, told a state-EPA roundtable."

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Climate Change

WV AG Welcomes Supreme Court Decision To Hear EPA Case.

Inside EPA (11/2) reports, "West Virginia Attorney General Patrick Morrisey (R), who led the successful state effort to win Supreme Court review of EPA's Clean Air Act authority to regulate power plant climate rules, is welcoming the justices' decision, saying he hopes they use the case to curb the agency's power. 'Congress has never given EPA a blank check to address climate change,' Morrisey told reporters Nov. 2. 'Under our Constitution, West Virginia and other states [are] entitled to a place at the table.'"

Supreme Court Ruling On EPA CAA Authority Could Prevent Broad Regulation.

Utility Dive (11/2, Howland) reports the "Supreme Court's decision to review a lower court's ruling striking down Trump administration regulations governing greenhouse gas (GHG) emissions from power plants" could "prevent the EPA from regulating GHG emissions across broad generating fleets...and instead require it be done on a power plant-by-power plant basis, legal experts said." The high court could rule "that the EPA cannot use section 111(d) as contemplated under the Clean Power Plan or...invoke the 'major questions' doctrine and find that the section is too vague and Congress needed to be more explicit in the authority the section gave the EPA," according to Columbia Law School Sabin Center for Climate Change Law Director Michael Gerrard.

Musk Says Tesla Has Not Signed Supply Deal With Hertz.

The **Wall Street Journal** (*Request Article*) (11/2, Abdel-Baqui) reports Tesla CEO Elon Musk said on Tuesday that the company has not signed a deal with Hertz to supply cars to the rental company. Musk's announcement appeared to contradict an earlier statement from Hertz saying the company was ordering 100,000 Teslas.

Biden Says World Made Progress On Countering Climate Change At COP26.

Norah O'Donnell opened the **CBS Evening News** (11/2, 6:31 p.m. EST, lead story, 3:45) by reporting President Biden on Tuesday secured "two big commitments that he hopes will slow the effects of climate change." Nancy Cordes added that the President "said he could not recall two more consequential days for future of the climate," and "in speech after speech...made ambitious promises to help heal an ailing planet." On **ABC World News Tonight** (11/2, 6:38 p.m. EST, story 3, 2:45, Muir), Chief White House Correspondent Cecilia Vega similarly said he is "heading home...after insisting world leaders made real progress in Glasgow." Biden: "I can't think of any two days where more has been accomplished, dealing with climate, than these two days."

Likewise, the **AP** (11/2, Boak, Knickmeyer, Miller) reports that the President "argued...historic progress on addressing global warming was achieved at the U.N. climate conference in Glasgow, Scotland, and expressed optimism for a similar outcome in Washington, where his legislative agenda has been stalled by intra-party disagreements." The AP adds that Biden "highlighted new efforts to stop methane leaks, protect forests, invest in new technologies and spend money on clean energy infrastructure," and he said, "I can't think of any two days where more has been accomplished on climate than these two days." Although the AP says his efforts "to meet U.S. commitments on climate change with a major domestic spending bill remained held up by legislative maneuvering," the **Washington Post** (11/2, Parker) reports in a live feed that the President "used his closing remarks at the COP26 climate summit...to make a last-minute pitch for his $1.75 trillion spending package and the raft of climate initiatives it includes."

The **New York Times** (11/2, Tankersley, Rogers, Friedman) reports Biden "said the United States pledged to be a 'partner' with vulnerable countries confronting climate change, while expressing confidence that his own domestic climate agenda is on track to pass Congress despite the wobbling of a key Senate Democrat this week." The Times adds the President "told reporters the meeting had re-established the United States as a leader on what he has called an existential threat to humanity, saying America would keep raising its climate ambitions and that his engagement on the issue had drawn thanks from other heads of state."

Meanwhile, the **Los Angeles Times** (11/2, Phillips, Megerian) says that as countries were "unable to reach consensus on how to quickly curb rising temperatures," Biden announced a "patchwork of announcements [that] generated a flurry of positive headlines Tuesday, despite environmental advocates' doubts that the convention will provide the momentum necessary to halt climate change before its deadly effects ravage more parts of the globe."

In an analysis, **New York Times** (11/2) White House correspondent Katie Rogers says Biden "did take some wins back to Washington with him on Tuesday night, including a new global minimum tax for companies, as well as climate agreements to reduce methane emissions – a deal he said was 'the foundational commitment' of his administration – and deforestation. But if those deals were significant, they were largely finalized before his trip." She adds that given the "lack of consensus among world leaders on how to move forward globally, and with his climate agenda hanging in the balance in Congress at home, Mr. Biden's time in Glasgow laid bare the reality that the personal style he prefers has not yet helped him close the gulf between his ambition and what he has been able to achieve."

In a live feed, **New York Times** (11/2, Bilefsky) says Biden "left the United Nations climate change summit on Tuesday with agreements to curb emissions of methane, a potent greenhouse gas, and to

end deforestation by 2030. But while the progress was notable, it still fell well short of the big prize: securing aggressive commitments to reach net-zero carbon emissions globally, to slow the rising temperatures that have led to lethal fires, floods, droughts and heat waves around the world. It also remains to be seen whether richer, polluting countries will follow through on their promises to provide $100 billion a year to help developing countries to fight global warming – a goal that John Kerry, the U.S. special climate envoy, said on Tuesday was within reach."

Kerry Predicts Countries Will Provide $100B Annually To Help Developing Nations Adapt To Climate Change. The **AP** (11/2, Muhumuza) reports that African leaders on Tuesday called on "the international community to do more to help poorer and vulnerable nations adapt to climate change, seizing on evidence showing the continent to be the most endangered by the effects of global warming." According to **Reuters** (11/2, Farge), "Developed countries pledged in 2009 to provide $100 billion by 2020 but it is not currently expected to be met until 2023, although a U.S. envoy and EU official said on Tuesday that it might be possible earlier."

The **New York Times** (11/2, Sengupta) reports US climate envoy John Kerry "said he expected new financial commitments to fulfill a long-delayed promise to provide $100 billion a year in aid for developing countries to fight and adapt to global warming." According to the Times, "The latest diplomatic effort, led by Germany and Canada, aims to pull together that amount from wealthier donor countries by 2023 – three years behind the timetable set in 2015 under the Paris Agreement." Kerry said, "I believe today, hopefully, that will be augmented."

In an analysis, **New York Times** (11/2) Climate Correspondent Christopher Flavelle says Biden "vowed at the Glasgow summit to start providing $3 billion each year, by 2024, to help developing countries adapt to climate change," and while the Administration "called it 'the largest U.S. commitment ever made to reduce climate impacts on those most vulnerable' worldwide, assuming that Mr. Biden can persuade Congress to come up with the money," the funds are "not as much as it seems." Flavelle adds the Federal Emergency Management Agency "spent $50.2 billion on disasters over the past 12 months, federal records show. That's about $3 billion every 22 days, for a country with just 4 percent of the world's population. And this wasn't even an especially bad year for storms."

Meanwhile, **Axios** (11/2, Freedman) reports "public and private entities" announced "big-dollar efforts [that] could yield carbon emissions reductions in the electricity sector, via land and forest conservation and other means." According to Axios, "The Rockefeller Foundation, the IKEA Foundation and the Bezos Earth Fund launched the Global Energy Alliance for People and the Planet. It aims to tackle access to renewable energy across Africa, Asia and Latin America during the next decade, along with carbon cuts and creating 150 million jobs. The Bezos fund alone is putting $500 million toward this goal."

McCarthy: Biden Is "Wide Awake" And Focused On US Climate Leadership. On **MSNBC's Morning Joe** (11/2), White House climate adviser Gina McCarthy, who is in Glasgow with Biden said, "When I saw the President yesterday, he wasn't just wide awake, but he was really on fire. He is really excited to have the United States back in action here in Glasgow. ... He's coming in not with just strong opening statement where he made it clear that we are fully back, but also recognizing that we have to work with other countries. ... We are delivering on methane reductions, which is going to buy us time to make sure that 1.5 degree centigrade can be held." McCarthy added, "President Biden is on fire domestically. He has put a $555 billion package together. He's going to move that through Congress. The Democrats are going to make this happen."

US Rejoins High Ambition Coalition. **Politico Europe** (11/2, Mathiesen, Colman) reports a State Department spokesperson confirmed the US has "rejoined a group of countries pushing for higher targets at the COP26 U.N. climate talks." According to Politico, "The return of the world's second-largest emitter and richest nation boosts the group, called the High Ambition Coalition, which is an informal alliance of small vulnerable countries and big Western states including the EU." Politico says the High Ambition Coalition is "demanding that countries in Glasgow raise their climate targets to align with the goal of limiting warming to 1.5 degrees Celsius."

Meanwhile, **Reuters** (11/2, Ljunggren, Shakil) reports Canadian Prime Minister Justin Trudeau on Tuesday announced that his government "plans to aim for still deeper reductions." According to Reuters, "Trudeau has already committed Canada to reducing emissions by between 40% and 45% below 2005 levels by 2030."

Mayors Call On World Leaders To Act On Climate Change. The **AP** (11/2, Kirka) reports "a group of big city mayors" on Monday traveled to the COP26 conference to "demand that world leaders follow the science and act now to head off a catastrophic increase in global temperatures." According to the AP, "The mayors sought to underscore their environmental credentials by making the 645-kilometer (400-mile) journey from London to Glasgow by rail."

Secret Service Locked Former Bank Of England Governor Out Of Main COP26 Venue. **Bloomberg** (11/2, Shankleman) reports former Bank of England Governor Mark Carney "missed" his panel discussion on climate finance Tuesday after US Secret Service had locked down the venue "until President Joe Biden left." According to Bloomberg, "The first few days of COP26 have been beset by logistical challenges, with attendees queueing for hours to get into the venue each morning."

Thiessen: Climate Change Is "A Chronic, Manageable Condition Humanity Can Live With." Marc Thiessen writes at the **Washington Post** (11/2) that while the President "declared climate change an 'existential threat to human existence as we know it'" it is "not. Climate change is not a meteor hurtling toward Earth to destroy humanity. Rather, it is a chronic, manageable condition humanity can live with." He cites Bjorn Lomborg, author of "False Alarm: How Climate Change Panic Costs Us Trillions, Hurts the Poor, and Fails to Fix the Planet." According to Thiessen, "The way to address climate change is to unleash the free market to increase prosperity and innovation. But climate alarmists are using false claims of doom to scare people into adopting policies that will have the opposite effect – destroying economic growth and increasing global poverty. That makes no sense."

Biden Calls For Reducing Methane Emissions And Announces US Actions.

Bloomberg (11/2, Dlouhy) reports that at the summit, President Biden "launched an assault on methane Tuesday, declaring that reducing emissions of the heat-trapping gas is one of the most important steps that can be taken to curb global warming." Bloomberg adds that the President revealed plans to "deploy at least five cabinet-level agencies," and he "also announced that nearly 100 nations have signed a joint U.S.-European Union pledge to collectively reduce global methane emissions 30% below 2020 levels by 2030." On **NBC Nightly News** (11/2, 6:36 p.m. EST, story 3, 2:15, Holt), Peter Alexander said Biden's methane announcement came with him "under pressure for demonstrate action, not words."

Biden Says Leaders Of China, Russia, And Saudi Arabia Should Have Taken Part In G-20, COP26 Summits. **Bloomberg** (11/2, Wingrove) reports Biden "said that Russia, Saudi Arabia and especially China were mistaken to skip the Group of 20 and UN climate conferences in Europe this

week, noting that Beijing missed an opportunity to participate in global leadership." The President stated, "They've lost an ability to influence people around the world and the people here at COP." He continued, "The single most important thing that's gotten the attention of the world is climate." He added, "It's just a gigantic issue. And [China] walked away."

Reuters (11/2, Spring, James) reports China "was represented in Glasgow by its chief climate negotiator Xie Zhenhua, who said in remarks to reporters on Tuesday that 'five years were wasted' because Biden's predecessor Donald Trump pulled the United States out of the Paris Agreement and it was time to 'work harder and catch up.'" The **Wall Street Journal** (*Request Article*) (11/2, Restuccia) provides similar coverage.

Meanwhile, **Roll Call** (11/2, Lesniewski) reports Biden "said Tuesday that he was not prodded by any foreign leaders about how the ongoing debate over his agenda back in Washington would affect the commitments the U.S. was making at the UN event." The President said, "What they're looking at is what in fact has happened in terms of everything from dealing with deforestation to what we're going to do on Build Back Better and how we've been able to focus now." Roll Call adds Biden "reiterated a familiar theme, that it was important for the U.S. to have a significant in-person presence in both Rome and Glasgow, with delegations led by Biden himself and including Cabinet secretaries and other envoys like Kerry."

Kerry Seeks To Recruit Nations To Join Non-Binding Methane Emissions Pact At COP26.

Bloomberg (11/2, Dlouhy, Ainger) reports that U.S. climate envoy John Kerry on Tuesday sought to recruit nations to join a pact to slash the world's methane emissions. Signing the pledge "would amount to shared recognition of the problem posed by the potent greenhouse gas – not a 'burden' to cut individual emissions, Kerry said." The pledge "isn't binding on the nations that sign it," and "they are under no obligation to cut their own methane emissions by a set amount, just to 'commit to a collective goal of reducing global methane emissions by at least 30% from 2020 levels by 2030' and to pursue the best available approaches to quantify the problem, according to an EU-U.S. release." That, Bloomberg says, has "lowered the bar for more than 90 nations – including cattle-rich Brazil – to sign on." **Axios** (11/2, Gonzalez) reports "105 world leaders on Tuesday signed onto the Global Methane Pledge" to reduce methane emissions by 30% by the end of the decade. **Axios** (11/2, Freedman) says, "The significance of this pledge at the COP26 summit shouldn't be overlooked. Though it's less abundant than longer-lived carbon dioxide, methane is dozens of times more powerful at trapping heat in the atmosphere." However, **NPR** (11/2, Sommer) correspondent Lauren Sommer said, the commitments world leaders are making at this summit "don't go far enough to keep the world at this crucial threshold for warming – that's that 1.5 degrees Celsius – because the science shows beyond that, you know, heatwaves and storms and flooding get substantially more dangerous." The best hope for this summit, she added, "is just to try to edge closer to that goal so it's within reach, maybe, down the line." The **Wall Street Journal** (*Request Article*) (11/2, Ferek) answers questions about why methane emissions are being targeted. **Reuters** (11/2, Spring, James), **Bloomberg** (11/3), **CNBC** (11/2) and **Offshore Engineer** (11/2) carry further coverage.

Biden Rejoins Coalition Aiming To Limit Global Warming To 1.5 Degrees Celsius. **The Hill** (11/2, Ali) reports, "President Biden took another big step in committing to combat climate change, rejoining the High Ambition Coalition at the United Nations climate talks." The group aims to limit global

warming to 1.5 degrees Celsius. The HAC "was responsible for including key elements of climate action in the Paris Agreement," like establishing "a pathway to net zero global emissions by the second half of the century and a five-year schedule for countries to update and reaffirm their climate change commitments, called nationally determined contributions (NDCs)."

Trudeau Calls On Countries To Adopt Global Carbon Tax. **CBC (CAN)** (11/2, Tasker) reports that, at COP26 on Tuesday, Canadian Prime Minister Justin Trudeau "urged all countries to agree to some sort of global price on carbon, a measure he says will dramatically curb the use of fossil fuels and level the playing field for countries like Canada that already impose a levy on emissions." Speaking at a panel discussion on the sidelines of the UN summit in Glasgow, "Trudeau said his government fought hard to impose its carbon tax policy over the opposition of political opponents in Canada, and now he wants to take that fight to the global stage."

Gielen And Bazilian: Focusing On Several Key Priorities Will Help Developing Nations Transition From Fossil Fuels While Meeting Energy Demands. Writing for **The Conversation** (11/2), Dolf Gielen and Morgan Bazilian of the Colorado School of Mines argue that the challenge for government officials "is figuring out how to help scale up clean energy dramatically while reducing fossil fuel emissions, and still meeting the rapidly growing energy demands of billions of people in developing and emerging economies." The authors "identified six strategic priorities that could help countries navigate this tricky terrain," including wider deployment of carbon pricing, de-carbonizing challenging sectors such as shipping and aluminum, helping China and other emerging economies transition away from coal, focusing on innovation, prioritizing green financing and cutting methane emissions.

Democrats Try To Save Methane Fee.

The **New York Times** (11/2, Davenport) reports Democrats on Tuesday were trying "salvage a major initiative to address climate change in their sweeping social and environmental policy bill amid opposition from" Manchin. A "centrist from one of the top coal- and gas-producing states," Manchin "has pushed to remove or weaken a provision that would impose a fee on emissions of methane, a powerful planet-warming pollutant that leaks from oil and gas wells." Manchin, who "has already effectively succeeded in stripping the bill of its most powerful climate change provision, a program that would have replaced coal- and gas-fired power plants with wind and solar power," has "doubled down on his resistance to the methane fee and other major elements of the bill as President Biden attends a climate change summit this week in Glasgow."

Environmental Group Expresses Concern About Expansion Of Federal Carbon Capture Tax Credits.

Bloomberg (11/2, Natter) reports in continuing coverage that the draft of President Biden's $1.75 trillion spending plan released by the House last week includes a provision that would increase tax credits for power plants that use carbon capture systems from $50 per metric ton to as much as $85 per metric ton. The Sierra Club said in a report that this increase could provide financial support for coal-fired plants and could help them stay open longer.

Global Carbon Council Expected To Issue Carbon Credits In Coming Months.

S&P Global Platts (11/2, Sebastian) reports that while the new Global Carbon Council (GCC) "is expected to issue more credit in the coming months, market participants have been speculating the likely prices of these GCC-certified credits, sources S&P Global Platts spoke with over the past week said." As of "Nov. 2, 133,667 GCC-certified credits have been issued and these were by Alibey Wind Power Plant in Turkey." Meanwhile, "approximately 20,000 mtCO2e hydro credits are expected to be issued to Turkey's Ova Hydro Power Plant by the end of this year." The GCC "said that further issuances have been delayed because of constraints due to a low number of GCC approved verifiers." Market participants "are gearing up for spot trading by setting indicative prices for credits."

Pembina Wants To Join Forces With Shell, Others On Alberta Carbon Capture Plan.

Reuters (11/2) reports Pembina Pipeline Corp. is "asking backers of two competing proposals for carbon capture hubs in the oil-producing province of Alberta to combine efforts with its own plan." Pembina and TC Energy are currently working on their Alberta Carbon Grid project, which "faces competition from at least two others – Oil Sands Pathways, pitched by the largest oil sands producers, and Polaris, a proposal by Royal Dutch Shell." Pembina CEO Mick Dilger said, "A single, large carbon capture program at scale is by far the most sensible way to do things. ... If everybody works together, we'll come up with a more cost-effective solution." Pembina has "spoken with both groups about joining together and talks remain active," according to Dilger.

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Energy Issues

CA Democrats Decide Not To Vote On Whether To Stop Accepting Contributions From Fossil Fuel Companies.

The **Sacramento (CA) Bee** (11/2, Korte) reports the California Democratic Party decided at a recent meeting to refer the question of whether to stop accepting campaign contributions from fossil companies to a subcommittee for four months of study instead of taking a vote on the matter.

Disclosure Reports Show Former Manchin Aides Lobbied For Energy Industries.

CNBC (11/2, Schwartz) reports Sen. Joe Manchin (D-WV) "has been working to shrink or eliminate key elements of President Joe Biden and the Democratic Party's massive social spending and climate proposal as several of his former advisors lobby Congress for their corporate clients." Manchin "has at least six former aides and advisors lobbying members of Congress, including senators, for power players in industries such as coal, pharmaceuticals, oil and gas, tobacco, and finance, according to more than two dozen filings to Congress." The "lobbying disclosure reports reviewed by CNBC span the third quarter, which started in July and concluded at the end of September." The reports "do not say whether Manchin or his office have been directly targeted by his former advisors."

Environmental Group Calls For Federal Review Of Offshore Drilling Operations Involved In CA Oil Spill.

NBC News (11/2, Douglas) reports the Center for Biological Diversity (CBD) sent a letter to the Bureau of Ocean Management on Tuesday urging the agency to conduct an environmental review of the offshore oil and natural gas drilling operations that were involved in the oil spill off the coast of California last month. The CBD "suggests changes in the volume of production or emissions necessitate a review, yet none has been done." A spokesman for Amplify Energy, which owns the operations, said the company remains committed to cleaning up the spill. In a statement, the company said, "We remain focused on environmental remediation efforts."

House Committee Subpoenas Leading Oil And Gas Companies, API And Chamber.

Reuters (11/2, Gardner) reports House Committee on Oversight and Reform Chair Rep. Carolyn Maloney (D-NY) "on Tuesday subpoenaed four major oil companies and two lobbying groups for documents related to their actions on global warming as part of a year-long probe into potential climate deception by the energy industry." Subpoenas were issued to ExxonMobil, Chevron, BP, Shell, the American Petroleum Institute, and the US Chamber of Commerce. Exxon spokesman Casey Norton "said the company has now provided almost 130,000 pages of documents", while Shell spokesman Curtis Smith "said Shell will continue to cooperate with the committee", and BP America spokesman J.P. Fielder "said BP is reviewing the subpoena and will continue working with the committee", and "Chevron did not immediately respond." US Chamber of Commerce spokesman Matt Letourneau "said 'we will review' the subpoena"; and API spokesperson Bethany Aronhalt Williams "said the group will work with the committee."

Axios (11/2, Reyes) reports the committee said the subpoenas would require BP, Chevron, ExxonMobil, Shell, the API, and the US Chamber of Commerce to hand over "key documents" which had not yet been turned over to the committee. Rep. Maloney explained, "I tried very hard to obtain this information voluntarily. The oil companies employed the same tactics they used for decades on climate policy--delay and obstruction." The **Washington Examiner** (11/2, Beaman) reports, "The subpoenas follow a contentious Oversight Committee hearing , during which Democrats accused Exxon Mobil, Chevron, BP America, Shell, American Petroleum Institute, and U.S. Chamber of Commerce of sitting for decades on information about the warming effects fossil fuels have on the climate." Each company and group will be required by the subpoenas "to produce intrafirm documents and communications dating back to November 2015 between executives, marketing, and public relations employees dealing with the subjects of climate change, clean energy, the industry's connection to climate change, and any media activities 'tending to influence public opinion on the issues.'" **The Hill** (11/2, Budryk) reports a memo related to the subpoenas said that Chevron and ExxonMobil had each failed to provide internal communications between executives as well as information on third party funding. BP had provided incomplete email correspondence and failed to disclose third-party funding information, while Shell failed to provide third-party funding information and board/senior executive materials, according to the memo. The API and Chamber of Commerce, meanwhile, "failed to provide internal senior executive communications requested by the panel."

The **Washington Post** (11/2), **Newsweek** (11/2), and the **AP** (11/2, Daly).

ME Votes No On New England Clean Energy Connect Referendum.

The **AP** (11/2, Sharp) reports Maine voters voted no Tuesday on a referendum over whether the proposed New England Clean Energy Connect hydropower transmission project should move forward. Utilities have "poured more than $90 million into the battle over the $1 billion project ahead of the referendum on Tuesday, making it the most expensive referendum in Maine history." However, "the statewide vote won't be the final word." Litigation "over the project will continue long after the votes are counted."

Newsom's Administration Weighs Cuts To Solar Incentive Program.

The **Los Angeles Times** (11/2, Roth) reports that "as the heat waves and wildfires of the climate crisis worsen – and as monopoly utility companies struggle to keep the lights on – Gov. Gavin Newsom's administration could soon make it harder for many families to go solar." California officials "have been laying the groundwork to slash a key solar incentive program called net energy metering, with a decision expected this year." While critics "insist net metering is fundamentally inequitable, widening the gap between rich and poor," solar companies and climate activists "say gutting incentives could cause installations to plummet on single-family homes, apartment buildings, businesses and schools." Edison International and SoCal Edison Senior Vice President of Public Affairs Caroline Choi said, "The program has to change. It's not sustainable when the folks who are least able to afford it are subsidizing those who do have the opportunity."

Renewable Energy Developer Scales Back Plans Fro Solar Farm In Copake, NY.

The **New York Times** (11/2, Rosen) reports renewable energy developer Hecate Energy is reducing the size of its proposed solar farm in Copake, New York from 500 acres to 245 acres in response to concerns about the project's impact. The challenge from Copake residents "mirrors similar battles raging across the country in rural areas like Lake County, Ore.; Clinton County, Ohio; and Troy, Texas." Developers "say industrial-scale solar farms are needed to meet the nation's goals to mitigate the rise of climate change, but locals are fighting back against what they see as an encroachment on their pastoral settings, the loss of agricultural land and a decline in property values."

Biden Administration Plans To Move Forward With Federal Oil And Gas Lease Sales In US West.

The **AP** (11/2, Brown) reports the Biden Administration will move ahead with plans "to sell oil and gas leases on huge tracts of public land in the U.S. West, despite the Interior Department's conclusion that doing so could cost society billions of dollars in climate change impacts, according to government documents." While these plans could change as regulators continue "to analyze greenhouse gas emissions and their effect on people and the environment," currently BLM officials "said for now there's little they can do to prevent the broad climate change impacts from burning fuels extracted from the remaining parcels...in part because they can't discern the significance of emissions from government-owned fuel reserves versus other sources."

CVR Energy Considering Spinoff Of Renewable Fuel Business.

Bloomberg (11/2, Freitas, Powell) reports CVR Energy Inc. CEO Dave Lamp said during a call Tuesday that the refiner may spin off its renewable fuel business. During the call, Lamp said, "We are taking a long-term view and want to prepare for the future. ... This could potentially provide us with more opportunity to access a greater pool of investors."

S&P Global Platts (11/2, McGurty) provides additional coverage.

Army Corps Of Engineers Holds Hearing For Mountain Valley Pipeline Permit.

The **Charleston (WV) Gazette-Mail** (11/2, Tony) reports the Army Corps of Engineers held a public hearing Monday for Mountain Valley Pipeline LLC's application for a water permit. The majority of commenters expressed concerns about the possible environmental impacts of the pipeline, while oil and natural gas industry and labor union officials said the pipeline would provide significant economic benefits.

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Toxics

EPA Staff Find Data Gap On PFAS In Breast Milk.

Inside EPA (11/2) reports, "Newly released presentation materials show that EPA staffers backed a call for new research to follow up on recent studies that found per- and polyfluoroalkyl substances (PFAS) in breast milk, as data gaps have left them with an 'extremely limited understanding' of nursing infants' potential exposures to the chemicals."

DOD Official Says PFAS Cleanups May Not Accelerate With Funding Boost.

Inside EPA (11/2) reports, "A senior Defense Department (DOD) official is cautioning state regulators that a significant boost in federal funding right now for the department to clean up per- and polyfluoroalkyl substances (PFAS) will not necessarily translate into faster cleanup because the department is in the early, investigative stages of its cleanup effort."

EPA Rule Requires Broader Reporting Of Mercury In Imports.

Bloomberg BNA (11/2, Rizzuto) reports an EPA revised final rule issued Tuesday requires "importers of hearing aids, fluorescent lights, and industrial equipment...to report to the EPA if parts within the goods they're bringing into the U.S. contain mercury." The new rule "implements a court order" handed down by the US Court of Appeals for the Second Circuit in June 2020 "vacating an exemption in a 2018 regulation."

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ESG

Campaign To Divest From Oil Companies Gains Support.

Under the headline "How To Delegitimize Fossil Fuel Companies? Divest!", Carolyn Fortuna writes in **CleanTechnica** (11/2), that there is "a glimmer of hope," in that "major investors are reorganizing their portfolios and divesting. In fact, nearly 1,500 institutions controlling almost $40 trillion in assets have committed to divesting from fossil fuels." Fortuna adds that "Big Oil once dominated Wall Street," and "the 5 largest publicly-traded oil companies (ExxonMobil, Royal Dutch Shell, Chevron, BP, and Total) spent over $1 billion on decades-long lobbying efforts to block climate action and on advertising campaigns to mislead the public about Big Oil's role in the climate crisis." Now "those days are over, with ExxonMobil removed from the" Dow Jones Industrial Average "and oil and gas companies now making up only 2.7% of the stock market's value, down from 28%."

Top 10 Global Mining Industry Sustainable Brands Listed.

Mining Global (11/2, Swallow) reports, "Sustainability is high on the agenda for the global players in the mining industry." But with "many areas to address, innovative decisions are required to provide a lasting impact on the environment, health of the workforce, and the efficiency and productivity of mining operations." The mining industry "supplies many organisations that are coming up with innovative solutions to climate change, but this list looks at how mining corporations are taking charge of their emissions and consumption." The list from 10 down includes: Komatsu; KGHM; Kamoa Copper; Exxaro; Frey New Energy; Caterpillar; Rio Tinto; BHP; Anglo American and Glencore.

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Message

From: Grundler, Christopher [grundler.christopher@epa.gov]
Sent: 11/3/2021 12:33:24 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Birnbaum, Rona [Birnbaum.Rona@epa.gov]; Culligan, Kevin [Culligan.Kevin@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]
Subject: Power Plant Data---3rd Quarter 2021

Ex. 5 Deliberative Process (DP)

Chris

Christopher Grundler, Director

Office of Atmospheric Programs
U.S. Environmental Protection Agency
202.343.9140 (o)
734.645.5221 (m)

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 11/3/2021 2:14:52 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
Subject: Notes For OIRA Call Today

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4.
5.

Ex. 5 Deliberative Process (DP)

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 11/5/2021 3:54:16 AM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
Subject: DONE!
Attachments: PARS Summary Narratives_Appointees.docx; PARS Summary Narratives_SES.docx

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: Stevens, Katherine [stevens.katherine@epa.gov]
Sent: 11/5/2021 4:48:03 PM
To: OAR Briefings [OAR_Briefings@epa.gov]
Subject: two packages: RAD Awards and Energy Star Industry 10th Anniversary
Attachments: RAD Awards Press Release_2021-v02Nov_ks_2.docx; DRAFT_RAD Comms Plan_2021-11-03.docx; draft comms plan for ENERGY STAR Challenge for Industry 10 year anniversary_ks.docx; for OAR review draft release for ENERGY STAR Challenge for Industry 10 year anniversary_ks.docx

Good afternoon,

Attached for review are:

- Energy Star Challenge for Industry 10 year anniversary (11/16)
  - Comms plan
  - Press release
- RAD Awards (event 11/17; comms actions 11/18)
  - Comms plan
  - Press release

Thanks,
Kati

Message

From: Monroe, Scott [Monroe.Scott@epa.gov]
Sent: 11/6/2021 9:15:21 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
Subject: FW: PARS Summary Write-ups
Attachments: PARS Summary Narratives_SES.docx; PARS Summary Narratives_Appointees.docx

This all looks perfect, thank you!

From: Goffman, Joseph <Goffman.Joseph@epa.gov>
Sent: Saturday, November 6, 2021 3:06 PM
To: Monroe, Scott <Monroe.Scott@epa.gov>
Subject: PARS Summary Write-ups

Ex. 5 Deliberative Process (DP)

I expect to have time on the trip back on Friday and over next weekend to take care of whatever I need to so that we meet the deadline.

Thanks as always for the help.

Joseph Goffman
Acting Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

Message

From: Gibson, Neshawne [Gibson.Neshawne@epa.gov]
Sent: 11/9/2021 11:01:54 PM
To: Gibson, Neshawne [Gibson.Neshawne@epa.gov]
Subject: Administrator's Weekly Report for 11/9/21
Attachments: Administrator Weekly Report 11.9.21 FINAL.pdf; Administrator Weekly Report 11.9.21 FINAL.docx

Hello Administrator Regan and colleagues,

Attached, please find the Administrator's Weekly Report (in both PDF and Word), which includes programs and regional office updates for the week ending November 10, 2021.

Sincerely,

Neshawne Gibson
Office of the Administrator
US Environmental Protection Agency
Phone: (202) 566-1957
Mobile: (202) 603-7617

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 11/18/2021 9:29:55 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: materials for Friday, November 19
Attachments: FAA Meeting Materials for Joe and Ale; Outreach-Climate and Power Sector launch v5.docx; ACE-CPP Repeal SCOTUS case_Admin. briefing 11.17.21.pptx

Additional materials attached: ACE litigation briefing ppt (to be scheduled for tomorrow)

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Friday, November 19, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

November 2021

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	**19**	20
21	22	23	24	25	26	27
28	29	30				

Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

November 2021

Fri, Nov 19

	Before 8:00 AM	**Free**
	8:00 AM – 11:00 AM	Do Not Schedule
	9:15 AM – 10:00 AM	Weekly Check-In
	11:00 AM – 11:30 AM	Management Roundtable
	11:30 AM – 12:00 PM	Touch Base on Power Plant Options
	12:00 PM – 12:30 PM	One-on-One with Sarah Dunham
	12:00 PM – 1:00 PM	American Indian and Alaska Native Heritage Month: Understanding Sovereignty from a Native American Perspective
	1:00 PM – 1:45 PM	Methane Fee Initial Scoping
	1:00 PM – 2:00 PM	All EPA Supervisors Roundtable Discussion about Future of Work
	1:45 PM – 2:30 PM	Outreach on Climate Rules for Power Plants (1 word doc)
	2:30 PM – 3:30 PM	EXTERNAL Virtual Meeting FAA and EPA (1 email)

■	3:30 PM – 4:00 PM	Bi-Weekly with OAR/OCSPP
■	4:00 PM – 4:30 PM	EPA/BOEM Call
■	4:30 PM – 5:00 PM	General Discussion
□	**After 5:00 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Payne, James (Jim) [payne.james@epa.gov]
Sent: 11/19/2021 1:32:28 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Arroyo, Victoria [Arroyo.Victoria@epa.gov]
Subject: FW: For Your Review: Draft Slides for Administrator Briefing on ACE Litigation
Attachments: ACE-CPP Repeal SCOTUS case_Admin. briefing 11.17.21.pptx

Ensuring you have these slides.

From: Hogan, Stephanie <Hogan.Stephanie@epa.gov>
Sent: Thursday, November 18, 2021 8:51 AM
To: Prieto, Jeffrey <Prieto.Jeffrey@epa.gov>; Payne, James (Jim) <payne.james@epa.gov>
Cc: Srinivasan, Gautam <Srinivasan.Gautam@epa.gov>; Marks, Matthew <Marks.Matthew@epa.gov>; Vijayan, Abi <Vijayan.Abi@epa.gov>; Hoffman, Howard <hoffman.howard@epa.gov>
Subject: RE: For Your Review: Draft Slides for Administrator Briefing on ACE Litigation

Attached are the final slides that were sent forward yesterday evening to the AO. Thanks to everyone for your thoughts and feedback.

Stephanie L. Hogan | Assistant General Counsel for the NSPS and Visibility Protection Practice Group | US EPA | Office of General Counsel | Air and Radiation Law Office | Mail Code 2344A | phone: (202) 564-3244 | fax: (202) 564-5603

Pronouns: she/her/hers

CONFIDENTIAL communication for internal deliberations only; may contain deliberative, attorney-client, attorney work product, or otherwise privileged material; do not distribute outside EPA or DOJ.

From: Hogan, Stephanie
Sent: Wednesday, November 17, 2021 3:25 PM
To: Prieto, Jeffrey <Prieto.Jeffrey@epa.gov>; Payne, James (Jim) <payne.james@epa.gov>
Cc: Srinivasan, Gautam <Srinivasan.Gautam@epa.gov>; Marks, Matthew <Marks.Matthew@epa.gov>; Vijayan, Abi <Vijayan.Abi@epa.gov>; Hoffman, Howard <hoffman.howard@epa.gov>
Subject: For Your Review: Draft Slides for Administrator Briefing on ACE Litigation

Jeff & Jim,

Attached are draft slides for the to-be-scheduled briefing with the Administrator regarding litigation strategy in the ACE SCOTUS litigation. We are due to send the presentation to the Administrator's Office by COB today, so if you could provide any feedback by 4:30 today, we can incorporate that into the final document.

This is being sent in the form of a word document that we are in the process of converting to a power point presentation. Please feel free to add any feedback directly to this document and we will make sure it is reflected in the power point.

Ex. 5 Attorney Client (AC)

appreciate your feedback as to whether we should attempt to reflect this in writing, or instead present those probabilities in our oral presentation on Friday.

Thanks,
Stephanie

Stephanie L. Hogan | Assistant General Counsel for the NSPS and Visibility Protection Practice Group | US EPA | Office of General Counsel | Air and Radiation Law Office | Mail Code 2344A | phone: (202) 564-3244 | fax: (202) 564-5603

Pronouns: she/her/hers

CONFIDENTIAL communication for internal deliberations only; may contain deliberative, attorney-client, attorney work product, or otherwise privileged material; do not distribute outside EPA or DOJ.

Message

From: Peacock, Grant [Peacock.Grant@epa.gov]
Sent: 11/18/2021 9:32:33 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Shaw, Betsy [Shaw.Betsy@epa.gov]; Edwards, Jonathan [Edwards.Jonathan@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Dunham, Sarah [Dunham.Sarah@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hyde, Courtney [Hyde.Courtney@epa.gov]; Wolfe, Michael [Wolfe.Michael@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]; Rowson, David [Rowson.David@epa.gov]; Veal, Lee [Veal.Lee@epa.gov]; Griggs, John [Griggs.John@epa.gov]; Cherepy, Andrea [Cherepy.Andrea@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Bunker, Byron [bunker.byron@epa.gov]; Burch, Julia [Burch.Julia@epa.gov]; Harvey, Reid [Harvey.Reid@epa.gov]; Lubetsky, Jonathan [Lubetsky.Jonathan@epa.gov]; Gunning, Paul [Gunning.Paul@epa.gov]; Newberg, Cindy [Newberg.Cindy@epa.gov]; 'Snyder, Carolyn' [Snyder.Carolyn@epa.gov]; Hopkins, Daniel [Hopkins.Daniel@epa.gov]; Koerber, Mike [Koerber.Mike@epa.gov]; Kornylak, Vera S. [Kornylak.Vera@epa.gov]; Brachtl, Megan [Brachtl.Megan@epa.gov]; Costa, Shelley [Costa.Shelley@epa.gov]; Whitlow, Jeff [Whitlow.Jeff@epa.gov]; Saltman, Tamara [Saltman.Tamara@epa.gov]; Monroe, Scott [Monroe.Scott@epa.gov]; LaRue, Steven [LaRue.Steven@epa.gov]; Mathias, Scott [Mathias.Scott@epa.gov]; Bullard, Pamela [Bullard.Pamela@epa.gov]; Alpert, Adina [Alpert.Adina@epa.gov]; Santiago, Juan [Santiago.Juan@epa.gov]; White, Sharon [White.Sharon@epa.gov]; Diaz, Charlene [diaz.charlene@epa.gov]; Wilds, Edward [Wilds.Edward@epa.gov]; White, Rick [White.Rick@epa.gov]; Stafford, Andrea [Stafford.Andrea@epa.gov]; Fine, Steven [fine.steven@epa.gov]; Siegel, Kelly C. [Siegel.KellyC@epa.gov]; Shoaff, John [Shoaff.John@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Watkins, Erica [Watkins.Erica@epa.gov]; Clark, Mike S. [Clark.Michael@epa.gov]; OAR Briefings [OAR_Briefings@epa.gov]; Suzuki, Debra [Suzuki.Debra@epa.gov]; Senter, Stephen [Senter.Stephen@epa.gov]; Millar, Emily [Millar.Emily@epa.gov]; Holden, Patricia [Holden.Patricia@epa.gov]; Marusiak, Eleanor [Marusiak.Eleanor@epa.gov]; Kabanda, Thierry [Kabanda.Thierry@epa.gov]; Rakosnik, Delaney [rakosnik.delaney@epa.gov]; Henning, Julie [henning.julie@epa.gov]; Ward, Hillary [Ward.Hillary@epa.gov]; Biton, Leiran [biton.leiran@epa.gov]; Hamjian, Lynne [Hamjian.Lynne@epa.gov]; Greene, Cynthia [Greene.Cynthia@epa.gov]; Walker, Lakeshia [Walker.Lakeshia@epa.gov]; Schumm, Krystal [Schumm.Krystal@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]
CC: DeLuca, Isabel [DeLuca.Isabel@epa.gov]; Millett, John [Millett.John@epa.gov]
Subject: November Business Review Materials
Attachments: Nov 2021 OAR Business Review Agenda.docx; FY 22 Ideas Improvements Celebrations_Nov.xlsx; FY 2022 Bowling Chart_October.xlsx; Goal 2 and Childrens Health Measure Development.pptx

Good Afternoon All,

Attached are the materials for the November 23, 3:00 PM-4:00 PM, OAR Business Review, which include the:

- Agenda;
- Bowling Chart;
- Cross Agency Measure PowerPoint; and
- MBR Supplemental (processes improved, employee ideas, celebrations).

Note that updates to these materials may be made before the Tuesday meeting.

Please remember that all Business Review materials are internal to the EPA.

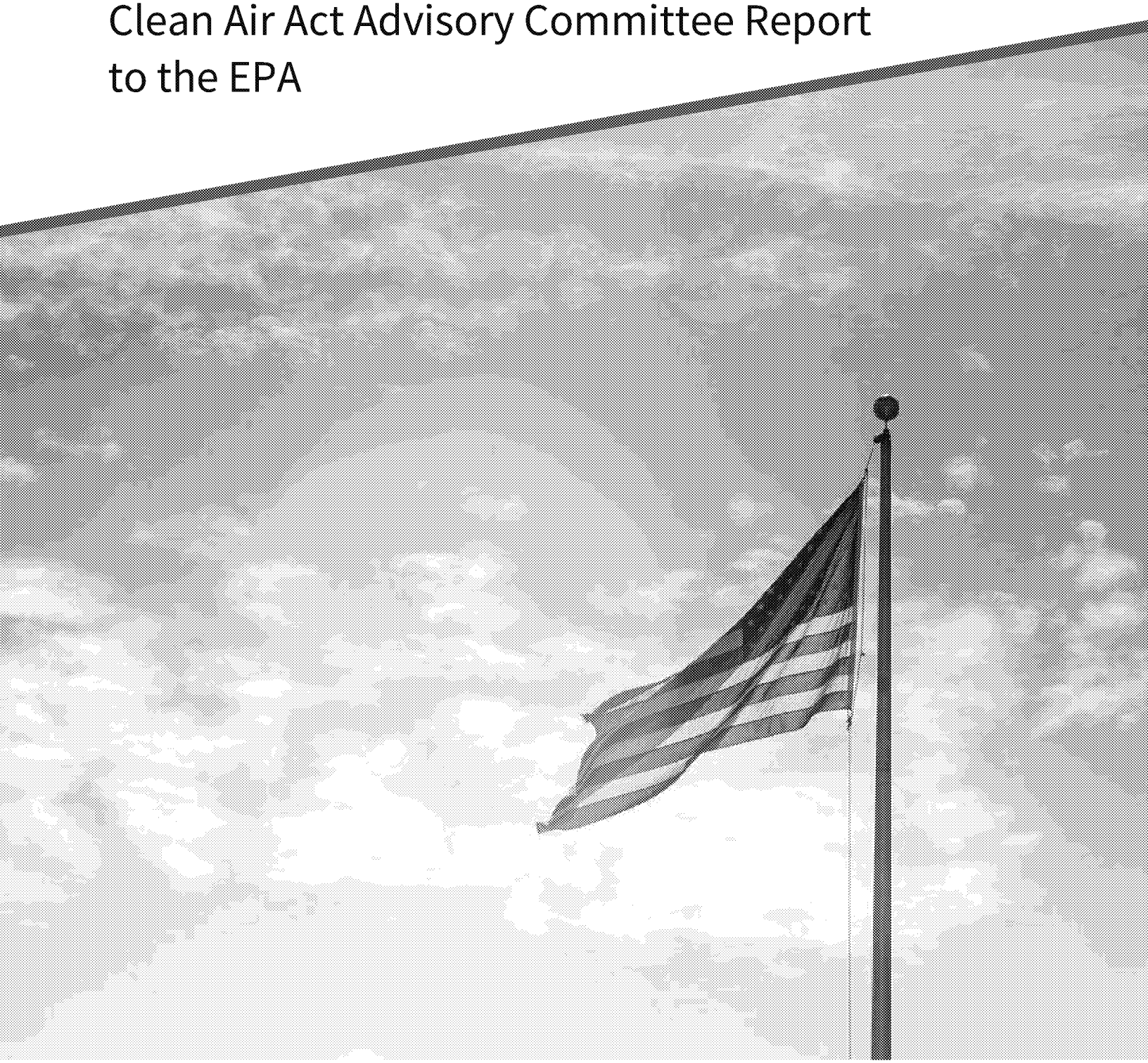
Let us know if you have any questions.

Thanks,
Grant Peacock

Office of Program Management Operations
Office of Air and Radiation
(202) 564-6732

The 50th Anniversary of the Clean Air Act

Clean Air Act Advisory Committee Report to the EPA



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Introduction

In 1970, Congress approved the modern Clean Air Act (CAA)[1] in the same month that the newly created Environmental Protection Agency (EPA) was initially organized.[2] Widely considered to be one of the most impactful and comprehensive federal laws due to its pervasive effect on health, the environment, and the economy, the CAA and its subsequent amendments put into place a wide range of regulatory programs with the specific purpose of improving the quality of the nation's air resources and promoting substantial economic growth and innovation.

Since the passage of the CAA, the combined emissions of six criteria pollutants (particulate matter (PM), sulfur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOCs), carbon monoxide (CO), and lead (Pb)), also known as criteria air pollutants (CAPs), have decreased by 74% across the United States. Emissions of toxic air pollutants, such as mercury, have decreased significantly as well. Notably, these improvements occurred as the economy grew markedly and energy use and vehicle miles increased.

The CAA requires the EPA to set health-based standards for ambient air quality, sets deadlines for the achievement of the standards by state and local governments, requires the EPA to set national emission standards for sources of air pollution (*e.g.*, motor vehicles, power plants, industrial sources), mandates emission controls for 187 Hazardous Air Pollutants (HAPs), imposes a cap-and-trade program to address acid rain, requires the prevention of significant deterioration of air quality in areas with clean air, requires a regional haze program to restore visibility in national parks and wilderness area, imposes an operating permit program for major sources, and implements the Montreal Protocol to phase out most stratospheric ozone-depleting chemicals. These hallmarks of the CAA, among other relevant topics, are discussed within this report.

The CAA is one of the most important pieces of public health legislation ever adopted in this country, as it has demonstrably helped protect the health of the citizens of the US. In the last fifty years, researchers have identified a range of physiological pathways by which air pollution impacts the body, from inducing inflammation, to triggering arrhythmias, promoting atherosclerosis,[3] suppressing the immune system,[4] and contributing to cognitive impairment and dementia.[5] [6] Epidemiologists have demonstrated that each 1 microgram per cubic meter of air (ug/m^3) increase in fine PM is associated with a 9.31% increase in hospital visits and admissions. Globally, exposure to $PM_{2.5}$ has been estimated to be the 5th highest mortality risk factor.[7] In the US, the successes of the CAA have reduced premature deaths, reduced the prevalence of certain diseases such as asthma, reduced medical expenses and school absences, and increased worker productivity.[8]

One of the greatest achievements of the CAA is the involvement of the public in its implementation. As directed by Congress, the CAA and the Administrative Procedure Act require the EPA to account for viewpoints of the full and diverse range of stakeholders impacted by the agency's actions. The EPA should continue to strive to increase accessibility to and transparency of participation and engagement in rulemaking and other processes under the statute, as appropriate.

The CAA also represents a regulatory approach based on cooperative federalism, in which local air quality issues and the policy tradeoffs that come with them are managed largely at the local level by state and local agencies and Tribal authorities. These partnerships were plainly important to Congress and have been a bedrock of the statute's successes to date by keeping implementation decisions at the local level and respecting the roles of state, local, and Tribal governments in maintaining and improving air quality. The CAA allows the EPA to promulgate federal standards and set a broad national regulatory framework, while those closest to the issues make the decisions on how to achieve these goals and requirements with oversight from the EPA. These governments play the most direct role in attaining and maintaining the National Ambient Air Quality Standards (NAAQS) under Title I and in applying other standards through the CAA permitting process. This statutory structure reflects Congress's recognition of the extent to which air quality concerns and regulatory approaches may differ across the country.

This report highlights the numerous successes of the CAA over the past 50 years since the passage of the 1970 CAA, and the gains in air quality that have been particularly pronounced in the past 30 years since the passage of the 1990 CAA Amendments. In addition, this report recognizes that air quality has dramatically improved, not only because of the implementation of the CAA over many decades, but due to the innovation and efforts of people across the country. Those people include those who work in the government (federal, state, local, Tribal), in companies, in non-governmental organizations, and as private citizens. Despite this continuing progress, however, as our scientific knowledge and social awareness improve, we find that additional work remains to achieve the twin goals of the statute: protecting and enhancing the nation's air quality and the productive capacity of the population. To that end, this report not only identifies successes, but also identifies challenges, opportunities, and recommendations for future implementation of the CAA for the EPA's consideration.

Development of the Report

In 2020, the EPA recruited members of the Clean Air Act Advisory Committee (CAAAC) to serve on a Work Group to develop a report on the 50th Anniversary of the Clean Air Act. Work Group members included representatives from a cross-section of perspectives from the CAAAC, including state governments, local governments, tribal governments, industry, and environmental groups. The CAA 50th Anniversary Report Work Group began meeting in September 2020 to review the EPA's charge and create a plan to draft this report. The report is intended to represent the range of CAAAC experience, expertise, and views, while making efforts to ensure the broader CAAAC had the opportunity to provide input to the process and the report itself.

In this regard, the Work Group distributed a survey to CAAAC members to solicit their views on successes, challenges, opportunities, and recommendations regarding the CAA. This process led to the development of a report outline, which the Work Group used in developing this document.

The Work Group solicited additional input from the CAAAC at its December 2020 meeting. After the Work Group provided a full briefing of the draft outline, members met in small groups of CAAAC members in virtual breakout rooms to share feedback on the outline, including important concepts, challenges, and recommendations for the report.

The Work Group split portions of the report into sections, assigning a lead writer and small writing committee for each major topic and met frequently via videoconference to gather feedback on sections to develop consensus viewpoints and review and edit drafts of each section.

The Work Group distributed a draft of this report in July 2021 as well as made a presentation concerning the draft report at the CAAAC meeting held that same month. CAAAC members were requested to submit written comments following the meeting, which were subsequently reviewed during several Work Group meetings in July through October 2021 in order to finalize the report for CAAAC approval. A "response to comments" document was made available to CAAAC members to identify comments received and the Work Group's responses to each, including to what extent the final version of the report may differ from the draft report as a result of those comments. The final version of the report was presented to the CAAAC at its October 2021 meeting and approved by the CAAAC.

While care was taken to separate the report into discrete sections, it is noteworthy that the themes underlying many of the issues and challenges cut across multiple sections of this report. For example, environmental justice (EJ) has its own dedicated section but touches on almost every other section of the report as well. The EPA's charge to the Work Group did not request suggestions for legislative changes, so the vast majority of the recommendations made within this report are capable of being implemented with the current framework of the CAA. In areas where additional legislative authority may be needed, care has been taken to note this possibility.

Finally, it should be recognized that the CAAAC represents diverse viewpoints and expertise. The recommendations expressed in this document are not necessarily those of any individual committee member or the clients, customers, and stakeholders they serve, and they should not be interpreted or represented as such.

---

1 Pub. Law 91-604 (Dec. 31, 1970).

2 EPA Order 1110.1 (Dec. 4, 1970).

3 Abelsohn, A., & Stieb, D. M. (2011). Health effects of outdoor air pollution: Approach to counseling patients using the Air Quality Health Index. *Canadian Family Physician*, *57*(8), 881–887.

4 Nagappan, A.; Park, S.B.; Lee, S.-J.; Moon, Y. Mechanistic Implications of Biomass-Derived Particulate Matter for Immunity, and Immune Disorders. Toxics 2021, 9, 18. https://doi.org/10.3390/toxics9020018

5 Chen, J.-C., Wang, X., Serre, M., Cen, S., Franklin, M., & Espeland, M. (2017). Particulate Air Pollutants, Brain Structure, and Neurocognitive Disorders in Older Women. *Research Report (Health Effects Institute)*, *193*, 1–65.

6 III, C. A. Pope., & Dockery, D. W. (2006). Health Effects of Fine Particulate Air Pollution: Lines that Connect. *Journal of the Air & Waste Management Association*, *56*(6), 709–742. https://doi.org/10.1080/10473289.2006.10464485

7 Cohen, A. J., Brauer, M., Burnett, R., Anderson, H. R., Frostad, J., Estep, K., Balakrishnan, K., Brunekreef, B., Dandona, L., Dandona, R., Feigin, V., Freedman, G., Hubbell, B., Jobling, A., Kan, H., Knibbs, L., Liu, Y., Martin, R., Morawska, L., … Forouzanfar, M. H. (2017). Estimates, and 25-year trends of the global burden of disease attributable to ambient air pollution: An analysis of data from the Global Burden of Diseases Study 2015. *The Lancet*, *389*(10082), 1907–1918. https://doi.org/10.1016/S0140-6736(17)30505-6

8 US EPA, O. (2015, July 8). *Benefits, and Costs of the Clean Air Act 1990-2020, the Second Prospective Study* [Overviews, and Factsheets]. US EPA. https://www.epa.gov/clean-air-act-overview/benefits-and-costs-clean-air-act-1990-2020-second-prospective-study

Attainment and Maintenance of the National Ambient Air Quality Standards

Introduction

One of the signal achievements of the CAA is the creation and attainment of NAAQS for six common pollutants – CO, lead, nitrogen dioxide (NO_2), ozone (O_3), PM, and SO_2 – known as CAPs. By establishing limits on ambient air pollution and a regulatory framework for attaining and maintaining them through State Implementation Plans (SIPs), Tribal Implementation Plans (TIPs), and Federal Implementation Plans (FIPs), the CAA has led to dramatic improvements in public health and welfare.

- Under Title I of the 1970 CAA, the EPA established the first set of NAAQS in April 1971.
- Following the promulgation of the first NAAQS, states submitted the first set of SIPs to attain and maintain the NAAQS within their jurisdictions and to avoid contributing to violations of the NAAQS in other states. The EPA also began issuing New Source Performance Standards (NSPS) to help reduce emissions from new sources.
- The 1977 CAA Amendments established a new framework for addressing persistent violations of the NAAQS by designating such areas (and nearby areas contributing to the violations) as "nonattainment," and mandating that special regulations be incorporated into the SIPs for these areas.
- The 1977 CAA Amendments also required the EPA to review the NAAQS at five-year intervals starting in 1980 and to consult with an independent advisory committee that came to be known as the Clean Air Scientific Advisory Committee in conducting these reviews.
- The 1990 CAA Amendments further addressed persistent violations of the NAAQS by creating pollution-specific classifications and SIP requirements and a system for "bumping up" an area's classification and regulatory requirements if it failed to attain the NAAQS on-time.

Successes

1. Criteria Air Pollutant (CAP) Reductions

There have been significant reductions in emissions of all CAPs and precursors, which has led to substantial improvements in ambient air quality, particularly since 1990:[9]

Table 1. Reductions in Criteria Pollution Emissions and Concentrations

Pollutant	Timeframe	Precursor Emission Reductions	Average Ambient Concentrations
CO	1990-2020	99.8 million tons per year (tpy) CO (69%)	78% reduction in peak 8-hour CO
NO_2	1990-2020	17.2 million tpy NO_X (68%)	58% reduction in annual NO_2 48% reduction in peak 1-hour NO_2
O_3	1990-2020	17.2 million tpy NO_X (68%) 11.1 million tpy VOC (48%)	26% reduction in peak 8-hour O_3
Pb[10]	2010-2020	0.283 thousand tpy Pb (30%)	78% decrease in peak 3-month Pb
PM_{10}	1990-2020	1.0 million tpy PM_{10} (31%)	38% decrease in peak 24-hour PM_{10}
$PM_{2.5}$	2000-2010	1.1 million tpy $PM_{2.5}$ (42%) 14.3 million tpy NO_X (64%) 14.5 million tpy SO_2 (89%) 4.9 million tpy VOC (29%)	45% decrease in annual PM2.5 44% reduction in peak 24-hour $PM_{2.5}$
SO_2	1990-2020	2.31 million tpy SO_2 (92%)	94% reduction in peak 1-hour SO_2

2. Poor Air Quality Days

The average number of days when O_3 or $PM_{2.5}$ air pollution reached levels considered "unhealthy for sensitive groups" across 35 major US cities decreased from 59 in 1990 to 18 in 2020. [11]

3. Attaining NAAQS

3.1. Almost all areas of the country are attaining the CO and NO_2 NAAQS: In 2019, all areas of the country were in compliance with all CO and NO_2 NAAQS, and in 2020, all areas of the country were in compliance with the 1-hour CO NAAQS, the 1-hour NO2 NAAQS and the annual NO_2 NAAQS and only one area was violating the 8-hour CO NAAQS.

3.2. Progress in attaining the other NAAQS: Emission reductions in nonattainment areas and across the country have helped achieve significant progress in allowing O_3, $PM_{2.5}$, PM_{10}, Pb, and SO_2 nonattainment areas attain these NAAQS, enabling a number of communities to get redesignated to "attainment."

3.3. Fewer nonattainment areas: Even as the NAAQS have gotten tighter, the number of areas designated nonattainment has significantly shrunk, particularly after the 1990 CAA Amendments. This enables many more communities to more extensively pursue their economic development goals and efficiently conduct transportation planning.

4. Frameworks for Addressing Air Pollution Transported Over State and International Borders

The CAA and the EPA have established a framework for addressing interstate air pollution, helping states and local governments with air pollution problems accelerate the attainment of the NAAQS and improving equity across states in reducing emissions needed to ensure attainment and maintenance of the NAAQS. These included Section 126 petitions, the Ozone Transport Commission in the Northeast, the NO_X SIP call, the Cross State Air Pollution Rule (CSAPR), and subsequent updates and guidance on Transport SIPs using the CSAPR framework. Section 179B of the CAA also provides a mechanism for areas significantly impacted by pollution from other countries to reduce the regulatory burden associated with a nonattainment designation while still ensuring some basic local pollution controls are in place as well.

5. Pollution Controls for Nonattainment Areas

Pollution control requirements for nonattainment areas, including Nonattainment New Source Review (NSR) permitting, Reasonably Available Control Technology (RACT), Reasonably Available Control Measures, Reasonable Further Progress, Inspection and Maintenance programs, and conformity have been important in enabling areas to attain the NAAQS as "expeditiously as practicable."

6. Proactive Programs to Assure Continued Attainment of the NAAQS

Since 1995, the EPA has created programs to support voluntary local efforts to reduce air pollution levels, stay in compliance with the NAAQS for "near-nonattainment" areas, and better position themselves for coming into compliance with the NAAQS quickly if they do violate them. These have included the Flexible Attainment Region program in 1995, the 1-Hour O_3 Flex Program in 2002, the Early Action Compact Program from 2002-2007, the 8-Hour O_3 Flex Program in 2006, the O_3 Advance Program in 2012, and the PM Advance Program in 2013.

7. Improved Understanding of Air Pollution

The CAA's provisions requiring regular reviews of the NAAQS with input from an independent scientific advisory committee have also led to a total of 44 reviews of the primary and secondary NAAQS and significant improvements to the scientific understanding of air pollution over the years. These reviews have enabled the EPA, states, local governments, and Tribes to better target their pollution control efforts in ways that achieve greater health protections more efficiently.

Opportunities

1. Mobile Sources

The EPA's mobile source emissions and fuels standards are projected to continue to achieve significant emission reductions in the future, even with continued growth in vehicle activity and equipment use. These nation-wide programs will go a long way to helping areas attain and maintain the NAAQS.

2. Stationary Sources

There are opportunities for additional emission reductions from stationary sources in many parts of the country. These could be achieved as a result of the CSAPR or other interstate transport SIPs, NSPS, RACT/reasonably available control measure rules, NSR permitting, significant in-use cases of new technology, and the reduced cost of natural gas and renewable energy relative to coal are also expected to yield significant reductions in CAP concentrations across the country.

3. The EPA's Completion of Reviews of Both the O_3 and PM NAAQS in Late 2020

Because the O_3 and PM NAAQS were last finalized within the same month in 2020, this may enable the EPA to coordinate the next reviews of these NAAQS due in 2025 and provide some time for the SIP process to work as initially envisioned.[12] The review of the O_3 NAAQS within the statutory 5-year timeframe and the acceleration of the completion of the PM NAAQS review also provide concrete examples of changes in the process of conducting a NAAQS review to meet deadlines that the EPA can use to help inform future NAAQS reviews for these and other pollutants.

4. Lesser-Used Provisions in the CAA

There are lesser-used provisions in the CAA that may be available to better tailor solutions for the wide range of situations communities face with attaining and maintaining the NAAQS. These include its authority to approve or disapprove "infrastructure" SIPs and issue "SIP calls" under Section 110, the more general nonattainment provisions of section 172 of the CAA (*i.e.*, Title I, Part D, Subpart 1), and Section 179B petitions related to international pollution transport.

5. Improvements in Air Quality Forecasting and Public Awareness About Current Air Quality

Forecasting and public awareness can help areas and the public take more targeted actions to reduce emissions on predicted high pollution days and help members of the public limit their exposure to high pollution when it occurs.

6. Sensor Technology

The widespread availability of low-cost sensors can significantly expand understanding of criteria air pollution across the country and can help inform EPA requirements for the siting of regulatory monitors in the future.

Future Challenges

1. Many People Live in Areas Violating the NAAQS.

In 2020, 96 million Americans lived in a county that is violating a NAAQS, almost all of whom live in an area violating either the O_3 or PM NAAQS.[13] This includes a significant number of people living in areas that are now violating a NAAQS for which they were previously designated "attainment/unclassifiable."

2. Disproportionate Exposure to Criteria Air Pollution in EJ Communities

The EPA's recent review of the PM NAAQS also indicates that there are clear, statistically significant racial disparities in exposure to PM air pollution, but its recommendations for consideration of an alternate NAAQS focused on "average" exposure across the country. To the extent that evidence exists of disproportionate air pollution exposure for communities of color and low-income communities, the EPA's approach to reviewing, establishing, and enforcing NAAQS for these groups has not seemed to adequately address these disparities.

3. Costs of Implementing Additional Controls in Nonattainment Areas

In many areas that have already implemented stringent rules and implemented expensive programs, achieving additional emission reductions may become cost-prohibitive to certain businesses. Nonattainment designations can have major economic impacts on certain key business sectors and restrict flexibility in transportation planning.[14] and while the EPA has some recent examples of quickly approving redesignation requests for areas that have attained the NAAQS, this is not always the case, and delays in redesignating areas to attainment can result in unnecessary delays and added costs for businesses to obtain permits in these areas.

4. Ambiguity About "Out-of-Cycle" Nonattainment Designations

While Section 107 of the CAA is very clear about the process and timelines for designating areas nonattainment, unclassifiable, and attainment for a new or revised NAAQS, it is ambiguous on the process for an area initially classified as attainment/unclassifiable for a NAAQS that subsequently records a violation. The EPA has rarely if ever initiated "out-of-cycle" nonattainment designations in such situations, but this results in areas with similar pollution concentrations violating the NAAQS being treated differently. The lack of clear criteria for when it would proceed with such a redesignation creates significant uncertainty for states, local governments, Tribes, businesses, and the public.[15]

5. Issues in Reviewing and Establishing NAAQS

There are a number of important unresolved issues related to reviewing and establishing the NAAQS, including the lack of clear thresholds below which harm does not occur for many pollutants, establishing secondary NAAQS distinct from the primary NAAQS, and completing NAAQS reviews within the 5-year timeframe required by the CAA. In addition, certain aspects of the NAAQS review process have received far less attention in recent years than perhaps they should have; very little consideration has been given to the proper averaging times and statistical forms for the NAAQS, relying instead on consistency with prior NAAQS reviews.

6. Interstate Transport of Emissions Continues to Pose Challenges to Attaining and Maintaining the NAAQS in Many Parts of the Country.

While the EPA has succeeded in establishing a framework for addressing interstate transport of O_3 and $PM_{2.5}$ through the CSAPR, interstate transport continues to make up a very large share of the air pollution problem in many parts of the country. For example, EPA interstate transport air quality modeling for the 2015 O_3 NAAQS showed that interstate transport accounted for 42% of all US anthropogenic O_3 contributions at monitoring sites that were still projected to be violating the 2015 O_3 NAAQS in 2023 outside of California, and at 11 of 38 of these sites, interstate transport accounted for more than 50% of the total US contribution. The EPA has also not issued any kind of update to the CSAPR for the 2012 $PM_{2.5}$ annual NAAQS, and its focus on areas with "Moderate" or higher classifications for the O_3 transport requirements leaves the roughly 4 out of 5 areas classified as "Marginal" without the benefit of any additional interstate transport abatement.

7. Properly Accounting for Pollution from Other Countries and Exceptional Events

The main purpose of the NAAQS program and nonattainment designations is to implement extra controls in areas with air pollution levels known to be unhealthy, but for regional pollutants like O_3 and $PM_{2.5}$ in particular, higher local air pollution concentrations due to international sources or exceptional events limits the effectiveness of local emission controls at reducing ambient air pollution concentrations. While the CAA does provide the EPA with mechanisms for dealing with these situations, there are still a lot of unresolved issues with their implementation. With the exceptional events policy in particular, there are major questions remaining about the consistency in the application of this policy in different parts of the country, the extent to which events that have been considered exceptional may no longer be so (*i.e.*, a single wildfire versus "wildfire season), and the appropriate policies for allowing exceptional event demonstrations to exclude air quality data from consideration with regard to an area's attainment status. The EPA should expect these factors to become increasingly important as the climate changes and extreme weather events occur more frequently.

8. Tension Between Easing Regulatory Burdens from Overlapping NAAQS and Anti-Backsliding

There are many areas that are designated nonattainment for multiple NAAQS for the same pollutant that vary only in their level. For example, there are 35 areas that are nonattainment for both the 2008 and 2015 O_3 NAAQS. Having to plan for two different NAAQS for the same area that may have different nonattainment area boundaries for each NAAQS can create a significant regulatory burden for states, Tribes, and local governments. On the other hand, such areas will almost always have less stringent planning requirements for the more stringent NAAQS. For example, 13 of the O_3 nonattainment areas are classified as "Marginal" for the 70 parts per billion (ppb) NAAQS but are classified as "Moderate" or higher for the 75 ppb NAAQS.

9. Challenges with SIPs, Especially for O_3

The EPA, states, local governments, and Tribes continue to face challenges with SIPs, particularly for O_3. For O_3 nonattainment areas, the large number of "marginal" areas not required to submit attainment plans, the very short 3-year periods between attainment dates for different classifications, the "bump-up" process, and the dozens of regulatory requirements for areas classified as "moderate" or higher, and the VOC-focused nature of those requirements cause significant inefficiencies and delays in attaining the NAAQS. There are also a number of issues that areas classified (or formerly classified) as "Severe" for the O_3 NAAQS face related to Section 185 fees, and how that provision of the CAA is applied creates some important uncertainties for states, local governments, and businesses. While the EPA has made a lot of progress in clearing the backlog of SIPs that it had not acted on yet, there still is a backlog, and deadlines for the EPA to act on SIPs are often not met. In addition, local air pollution levels of some pollutants such as O_3 and $PM_{2.5}$ are significantly impacted by factors beyond their control, including intrastate, interstate, and international air pollution, biogenic emissions, and exceptional events. Moreover, frequent litigation over the NAAQS and every aspect of their implementation creates significant uncertainty and inefficiencies in conducting good air quality planning.

10. Challenges in Public Communication About Attainment/Violation of the NAAQS and the Air Quality Index

There is a significant discrepancy between the way the public consumes and uses air quality data on a day-to-day basis (*i.e.*, the Air Quality Index, or real-time, short-duration concentration data from air quality sensors) and the statistical form of the NAAQS. It can be difficult to explain to members of the public and stakeholders that an area can be in attainment of the NAAQS but still periodically exceed the level of the NAAQS.

11. Air Quality Issues Related to Agriculture Remain Challenging.

For a variety of air quality issues including air pollution's impact on crop yields, ammonia and PM emissions from farms, agricultural burning, and NO_X emissions from nitrogen-based fertilizer, the agricultural sector remains an especially challenging one for air quality issues. As urban areas continue to grow and move into areas that were formerly agricultural, the EPA, states, and local governments seem likely to continue to face important issues in whether and how to work with the agricultural sector on these issues.

Recommendations

1. Improve the NAAQS Review Process.

1.1. Reduce Uncertainty about Timing and Finality of NAAQS Reviews: While the CAAAC recognizes the challenge of balancing the need for conducting high-quality, legally defensible NAAQS reviews with completing the reviews at five-year intervals, the EPA should strive to adhere to the statutory five-year requirement. This ensures that the NAAQS are reflecting the latest scientific understanding of air pollution in a timely manner and helps reduce the pressure a new administration may feel to "reconsider" a NAAQS review decision made late in the term of the prior administration. The last such reconsideration that took place for the 2008 O_3 NAAQS ultimately just postponed both the implementation of the 2008 NAAQS and the completion of the next O_3 NAAQS that was eventually completed in 2015. To the extent that a new EPA Administrator may feel that the prior Administrator's decisions on NAAQS reviews were not protective enough, it should instead consider accelerating the next periodic NAAQS review and leverage its authority under Section 110 of the CAA to achieve additional emission reductions under the auspices of reducing interstate transport or "maintaining" the existing NAAQS.

1.2. Synchronize NAAQS Reviews with Common Precursors: The EPA should consider synchronizing its NAAQS reviews for pollutants that share precursors (such as O_3, PM, NO_2, and SO_2) to maximize the ability to account for co-pollutant effects and the potential benefits of multi-pollutant control approaches, similar to the sulfur oxide (SO_X)/NO_X/PM secondary NAAQS review currently underway.

1.3. Ensure Continued Accounting for the Level of Protection Needed for EJ Communities in the NAAQS Review Process as "Sensitive" Populations: Similar to the analysis conducted in the 2020 PM NAAQS review, the EPA should be explicitly considering differential and cumulative exposure by race/ethnicity and income for all NAAQS reviews as part of their analysis of "sensitive" populations.

1.4. Evaluate Forms and Averaging Times for O_3 and PM NAAQS to Account for Weather Trends: Given observed trends in weather conditions, the EPA should conduct a more thorough review of the appropriate form and averaging times for the next O_3 and PM NAAQS reviews and should periodically conduct this kind of thorough review for each pollutant. The forms and averaging times of the O_3 and $PM_{2.5}$ NAAQS have remained the same for 24 years, and the form and averaging time of the PM_{10} NAAQS has remained the same for 34 years, despite clear trends in weather conditions, including weather extremes, since then and projected into the future. While it may not be necessary or appropriate to thoroughly evaluate these elements of the NAAQS in every review, the EPA should incorporate a more thorough review of these elements in the next O_3 and PM NAAQS reviews, and perhaps every other review after that.

1.5. Account for International Transport in Reviewing the NAAQS: In assessing the appropriate level, averaging time, and statistical form of the NAAQS, the EPA should consider the extent to which long-range international transport of air pollution contributes to ambient air concentrations and the variations in these contributions over different timeframes.

1.6. Move Implementation Rules Forward in Tandem with NAAQS Reviews: The EPA should propose and finalize implementation rules for any revised NAAQS in tandem with the NAAQS revision proposal and finalization (*i.e.*, simultaneously, if possible, but if not, within months, rather than years, of the schedule for proposing and finalizing the NAAQS reviews). To the extent that the EPA may wish to consider formally proposing or accepting comment on new or potentially challenging implementation issues, it should consider bringing these issues to the CAAAC for input prior to proposal.

2. Make Better Use of the Full Range of Authority in the Area Designation Process.

Following a NAAQS revision, the EPA should consider more extensive use of its options to extend the designation process by a year beyond the standard 2-year timeframe or designate an area as "unclassifiable," especially if an area's air pollution levels are very close to the level of the NAAQS, or at least one of the three years in the 3-year period covered by the NAAQS had air pollution levels that would meet the NAAQS. Outside of the initial designation period, the EPA should establish clear rules or guidance in conducting "out of cycle" nonattainment designations and should carefully track the status of any area it designated as "unclassified" in the initial designations.

3. Consider Requiring More Interstate Air Pollution Abatement.

Given the large contribution of interstate air pollution to O_3 and PM design values in nonattainment areas and "near-nonattainment" areas, the EPA should require more reductions in O_3 and PM air pollution from upwind states than is currently being achieved to better address the problem of interstate transport. For example, the EPA could increase its cost-per ton thresholds for point sources, expand its consideration of pollution sources beyond power plants and other point sources, or lower the level of air quality impacts that would be considered "significant." It could also encourage more states to create their own mobile source emission reduction incentive programs like California's Carl Moyer program or the Texas Emission Reduction Plan (TERP).

4. Improve Implementation of Exceptional Events Rule and International Transport Provisions to Better Account for Uncontrollable Pollution.

In light of the large amount of effort that can go into exceptional events demonstrations, the EPA should work with its regional offices to ensure that a consistent, rigorous, and transparent standard is applied to the review of these demonstrations that also accounts for differences in circumstances across the country. In addition, since 179B(a)(2) allows states to model attainment of the NAAQS "but for emissions emanating from outside of the US," the EPA should consider all emissions from outside of the US, not just anthropogenic emissions, in considering approval of 179B demonstrations.

5. Modify Approach to SIP Requirements and Classifications for Nonattainment Areas.

The EPA should consider using the more general nonattainment planning requirements of Title I, Part D, Subpart 1 for implementing NAAQS in situations in which doing so may be legally permissible instead of only considering the use of the pollutant-specific planning framework specified under Subparts 2-5.[16] While we recognize that the EPA would need to weigh the uncertainties involved with pursuing this type of implementation, given the various constraints the courts have placed on them in this regard, there are many ways in which Subpart 1 implementation could provide more expeditious and efficient attainment and maintenance of the NAAQS than continued implementation of Subparts 2-5 for new NAAQS that were not in place in 1990. To the extent that the EPA continues to use the Subpart 2 framework for O_3 nonattainment areas, it should consider alternative approaches to classifying areas that the 2001 *Whitman v. ATA* decision may allow in order to avoid classifying so many areas as "Marginal." These areas are not required to have any attainment plan and if such areas are not expected to attain the NAAQS within three years, a "Marginal" classification can be problematic. Examples of alternatives include using modeling to assess the likelihood of attaining the NAAQS within 3 years of designation or using the 1990 distribution of nonattainment areas into these classifications.

6. Ensure Timeliness of Actions Related to SIPs.

The EPA should commit to completing the review and approval or disapproval of SIP submissions by the deadlines specified in the CAA and should provide notice to states, Tribes, and local governments of the potential need to revise a SIP as a result of failure to attain the NAAQS at the earliest possible date. If additional resources are needed to accomplish this, the EPA should request these resources from Congress.

7. Consider Issuing "Early Action" SIP Calls to Address Problems Maintaining the NAAQS.

In situations in which an area designated as "attainment" violates the NAAQS but is not subject to a maintenance plan, the EPA should consider exercising its authority under Section 110(k)(5) to call on states and Tribes to submit revisions to their plans, if they determine them to be inadequate to attain or maintain the NAAQS, as an alternative to designating these areas as "nonattainment." While circumstances now are different, this could be implemented in a manner similar to the EPA's highly successful "Early Action Compacts" from 2002-2004.

8. Consider Updating Transportation Conformity Policies and Practices.

The EPA should work with the Association of Metropolitan Planning Organizations, the American Association of State Highway and Transportation Officials, and other stakeholders to review and update its transportation conformity rules and practices. There are significant inefficiencies in the current process, and targeted updates can help ensure that EPA implementation of this requirement does not create an undue burden on transportation planning efforts. The EPA should also consider this in light of the substantial emission reductions projected for onroad sources that have already been achieved and are expected to continue well into the future as a result of existing onroad mobile source controls implemented by the EPA, states, local governments, and Tribes.

9 https://gispub.epa.gov/air/trendsreport/2020/

10 Baseline emissions for lead is the 2008 NEI as listed in the Trends inventory to most closely match the 2010 baseline for monitoring data.

11 https://gispub.epa.gov/air/trendsreport/2020/

12 The CAAAC recognizes that EPA is in the process of reconsidering both the O3 and PM NAAQS determinations made in 2020, but whatever process is ultimately followed with respect to these standards, EPA should seek to coordinate reviews to allow for efficient implementation.

13 https://www.epa.gov/air-trends/air-quality-national-summary. "Number of People Living in Counties with Air Quality Concentrations Above the Level of the NAAQS in 2020"

14 https://www.epa.gov/air-trends/air-quality-national-summary. "Number of People Living in Counties with Air Quality Concentrations Above the Level of the NAAQS in 2019"

15 A notable exception was EPA's announcement in May 2021 that it would modify the boundaries of the Chicago, St. Louis, Door County WI, Manitowoc County WI, Sheboygan County WI, Northern Milwaukee/Ozaukee Shoreline WI nonattainment areas, and was proposing to expand the Dona Ana County, NM, and Denver Metro/North Front Range, CO nonattainment areas.

16 For example, the 2001 *Whitman v. ATA, and* the 2006 *South Coast v. EPA* decisions allow for consideration of the use of Subpart 1 for O_3 nonattainment areas with design values below 90 ppb, which includes all but two O_3 nonattainment areas as of the end of 2019.

Hazardous Air Pollutants

Introduction

Whereas most of Title I of the Act addresses "criteria pollutants" (because listing is based on the criteria documents dictated under Section 109), Section 112 is dedicated to HAPs. Because Section 112 was substantially revised in 1990, this report dedicates a chapter to it, separate from the Stationary Source programs chapter that immediately follows it. Prior to 1990, Section 112 defined a HAP as "an air pollutant to which no ambient air quality standard is applicable and which in the judgment of the Administrator causes, or contributes to, air pollution which may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness." 42 USC. § 7412(a)(1) (1970). Section 112 required the EPA to compile a list of HAPs and akin to the process under Section 111 (NSPS), the EPA was to propose standards for the newly listed HAP and finalize those regulations within just 180 days. Standards were required to be set in a manner that protected public health with an "ample margin of safety." 42 USC. § 7412(b)(1)(B) (1970).

Given these tight timeframes and the underlying assumption in the statute that the EPA would be able to easily access the information it needed to establish regulations, as well as the ambiguity as to the scope of coverage required for regulating a given HAP, once listed, the program only had limited success. These timeframes and ambiguities meant that the EPA was only able to issue seven HAP standards prior to 1990.

The 1990 Amendments established a more methodological approach to HAP regulation. First, it provided a finite list of HAPs to eliminate the "listing" step in the regulatory process. Congress listed 188 HAPs. 42 USC. § 7412(b). Second, it directed the EPA to establish a list of source categories of "major sources" of HAPs (defined as a source with the potential-to-emit 10 tpy of a single HAP or 25 tpy of combined HAPs) and to do so by 1992. Third, it established a two-step regulatory process, consisting of setting technology-based standards under Section 112(d) at the outset, and then 8 years later, evaluating whether risk remains that warrants further regulation of the source category. 42 USC. §§ 7412(d), (f). The technology-based standards for major sources are commonly called the maximum achievable control technology (MACT) standards. New source MACT is set based on the emissions control achieved by the best controlled similar source and existing source MACT is set based on the average emission limitation achieved by the best performing 12 percent of existing sources in the category or subcategory. 42 USC. §§ 7412(d)(3). The schedule for establishing the initial technology-based standards for major sources was aggressive, requiring all of the standards to be issued by the end of 2000.
42 USC. §§ 7412(e).

Section 112 also establishes an "area source" program, which are those sources with potential emissions below the major source thresholds. Section 112(d) authorizes, but does not require, the EPA to issue area source standards for source categories. Area sources are typically subject to the less stringent generally available control technology standards.

Finally, in 1990, Congress added to Section 112 a provision addressing prevention of sudden, catastrophic releases of air toxics by establishing an independent Chemical Safety and Hazard Investigation Board. The Board is responsible for investigating accidents involving releases of hazardous substances, conducting studies, and preparing reports on the handling of toxic materials and measures to reduce the risk of accidents.

Section 112(r)(7) directs the EPA to issue prevention, detection, and correction requirements for catastrophic releases of air toxics by major sources, which are referred to as the Risk Management Program or "RMP" regulations. Section 112(r)(7) requires owners and operators of stationary sources storing regulated substances at specified threshold quantities to conduct worst-case release scenario modeling and to prepare risk management plans including hazard assessments, measures to prevent releases, and a response program.

Successes

The structure of Section 112 and substantial effort by the EPA, state agencies implementing Section 112 requirements and regulated entities implementing the standards have led to a series of significant accomplishments since 1990:

1. The EPA met Congress's directive to list categories of major sources under Section 112 for regulation under the aggressive 10-year schedule set by Congress for technology-based MACT standards by initially listing 174 categories.[17]
2. The EPA issued *97* MACT standards covering *all of the 174 major source categories* originally listed by the Agency.[18]
3. The EPA has issued MACT standards based on performance of technologies but hewing to Congress's direction to establish performance-based standards that allow companies to achieve the standards in the most cost-effective manner available.
4. The EPA has also regulated 68 area source categories, such as dry cleaners, hard chromium plating operations, aluminum foundries, and synthetic rubber manufacturing.[19]
5. The EPA has completed approximately 90 Residual Risk and Technology Reviews (RTRs) under Sections 112(d)(6) and (f), and it is scheduled to complete 8 additional RTRs before the end of 2022.[20] The EPA's residual risk analyses have determined that the regulated industry has achieved emission levels for virtually every major source category regulated by MACT standards sufficient to protect public health and the environment with an ample margin of safety.
6. The EPA's implementation of the Urban Air Toxics program has made substantial progress to reduce air toxics across the country since the adoption of the Integrated Urban Air Toxics Strategy in 1999. The Agency's *Second Integrated Urban Air Toxics Report to Congress*, issued in 2014, outlines this progress. The report confirms that the country has made substantial progress, having eliminated millions of tons of toxic pollutants over the last two decades, including:

    6.1. A 66 percent reduction in benzene

    6.2. A nearly 60 percent reduction in mercury from man-made sources like coal-fired power plants

6.3. An 84 percent decrease of lead in outdoor air

6.4. From 1990 through 2012, the removal of an estimated 1.5 million tpy of HAPs from stationary sources and approximately 3 million tpy of criteria pollutants as a co-benefit of HAP reductions

6.5. The removal of an estimated 1.5 million tpy of HAPs from mobile sources, which represents a 50 percent reduction in mobile source HAP emissions.[21]

7. The EPA's Urban Air Toxics Outreach and Education program has supported numerous education and outreach initiatives including:

7.1. Training programs through the Institute for Tribal Environmental Professionals, the online Air Pollution Training Institute, and EJ communities are delivering critical information to state, Tribal, and local partners that implement air toxics rules.

7.2. EPA funding for air monitoring initiatives, including monitoring near roadways in larger cities and grants for community-scale air monitoring, have empowered communities and individuals to take action to avoid air pollution exposure using routine and low-cost portable air pollution sensors.

7.3. Partnerships with the National Association of Clean Air Agencies, the National Tribal Air Association, and the National Environmental Justice Advisory Council (NEJAC) foster community capacity building and help improve understanding of local air toxics issues.[22]

8. Companies have implemented the Risk Management Plan provisions of the CAA Section 112(r), conducting analyses of hazards and mitigating them as well as planning for response actions. "The Risk Management Program is about reducing chemical risk from accidental releases at the local level. The RMP information helps local fire, police, and emergency response personnel (who must prepare for and respond to chemical accidents) and is useful to citizens in understanding the chemical hazards in communities."[23]

9. Dating back to 2002, the EPA has completed 7 National Air Toxics Assessments (NATA) as screening tools for states, local, and Tribal air agencies for health risks from exposure to HAPs across the country. The NATA helps agencies identify which pollutants, emission sources, and locations to study further to understand risks and mitigate risks from ambient exposure to HAPs within their jurisdictions at the census tract level. The scope of the NATA has increased significantly over the past twenty years, covering 32 HAPs in the initial report, and now covering 180 HAPs in the two most recent reports. The NATA has numerous applications at the national, state, and local levels, including informing priorities for improving emissions inventories, expanding the air toxics monitoring network, helping target risk reduction activities, and helping communities design their own assessments. Two other notable applications of the NATA are its inclusion in the EPA's EJSCREEN tool and its use in scoring criteria for Diesel Emission Reduction Act (DERA) grant awards."[24]

Opportunities and Future Challenges

While the core technology program and residual risk programs have been a substantial success and Americans are healthier and safer as a result, additional opportunities remain under the statute.

1. Completion of residual risk analyses for source categories under Section 112(f) is an important aspect of the program and has been delayed for a range of reasons – with the majority of those deadlines coming due between 2005 and 2015. While it is recognized that the delay is partially attributable to the large number of source categories the EPA has regulated under Section 112(d), it is a high priority to complete this congressional charge.

2. The EPA has also struggled to complete the technology reviews under Section 112(d)(6), which require the EPA to update standards if necessary, taking into account developments in practices, processes, and control technologies.

3. Current standards, although written as performance standards, may stifle innovation and opportunities for pollution prevention because the standards are written in a very prescriptive manner (in part to assure enforceability). Due to judicial interpretations of statutory language, the EPA has faced difficulty taking into account the implications of HAP-reducing technologies for greenhouse gas (GHG) and criteria pollutants (*e.g.*, controls required for MACT based on the congressionally-mandated Section 112(d) "floors" requiring incineration-based controls, even though those may increase GHG emissions and criteria pollutants) and felt constrained in its ability to balance these competing goals. This issue has been cited as frustrating facilities' substantial efforts to reduce carbon footprints.

4. To date, EPA cost analyses have not been keyed to the actual costs of implementation of the requirements. To its credit, the EPA has undertaken some retrospective analyses to compare its pre-regulatory costs and benefit forecasts with actual experience.

5. Section 112 standards can be exceedingly difficult to interpret and apply. This is due to several factors. For example, many standards include cross-referencing between subparts of part 63 (*e.g.*, incorporating by reference language from one source category standard into another, which requires a regulated entity to cross-reference several standards to determine the regulatory language that applies to a given piece of equipment). In addition, standards may include complex cross-references even within standards that make interpretation difficult, and the EPA often issued (as a cost-savings measure for the agency) standards for multiple source categories in a single rulemaking action, which led to confusion regarding the preamble statements and interpretations that applied to particular regulatory language. Another example is the rationalization and updating of standards that are subject to subsequent court decisions (such as for the startup, shutdown, and malfunction provisions).

Recommendations

1. The EPA should endeavor to complete as expeditiously as practicable the remaining residual risk analyses for source categories that have not yet been addressed under Section 112(f). The EPA should communicate to Congress the challenges that it faced with respect to completing these reviews in the timeframe allotted.

2. The EPA should be timely in its technology reviews under Section 112(d)(6). Like the Section 112(f) reviews, the challenges inherent to the timing and approach to these reviews may be an issue worthy of review. The EPA should communicate to Congress the challenges that it faced with respect to completing these reviews in the timeframe allotted.

3. The EPA should advise Congress on what the frequency of updates should be, in light of resources available and the pace with which technology advancements are expected to occur. The EPA could set up streamlined technology reviews when an initial analysis indicates no meaningful advancement in technology. The EPA published a federal register notice in 2011 soliciting comment on such an approach in the context of NSPS standards under Section 111, but it has not taken further action on it.[25] In any case, the EPA should find ways under existing authority to streamline the process, especially where the RBLC indicates that advances in technology have not been demonstrated. Because HAPs are either VOC or particulate, existing databases would generally be able to indicate whether there has been an advancement that would warrant the substantial investment required for rulemaking, and using these databases would thus enable an efficient discharge of this statutory obligation in most instances.

4. The EPA should consider ways to ensure that innovative compliance approaches can still be allowed, which could reduce costs and also provide for even greater emissions and risk reduction.

5. The EPA should use the lessons from retrospective cost analysis comparisons in order to enhance pre-regulation cost/benefit forecasts for future rulemakings.

6. The EPA should attempt to simplify Section 112 standards where possible to facilitate both compliance and enforcement. It would be beneficial for the EPA to continue its efforts to simplify and make standards clear so that regulated entities, state regulatory agencies, and EPA regional offices can all arrive at the same conclusions regarding compliance.

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17 EPA, "National Air Toxics Program: The Second Integrated Urban Air Toxics Report to Congress," at 2-4 (Aug. 21, 2014), *available at* https://www.epa.gov/sites/production/files/2014-08/documents/082114-urban-air-toxics-report-congress.pdf.

18 *Id*.

19 *See id*. at 2-3; *see also* EPA, "National Emissions Standards for HAPs – Area Source Standards," *available at* https://www.epa.gov/stationary-sources-air-pollution/national-emissions-standards-hazardous-air-pollutants-area-source-0 (last updated Feb. 11, 2021).

20 *See* EPA, "Risk, and Technology Review of the National Emissions Standards for HAPs," https://www.epa.gov/stationary-sources-air-pollution/risk-and-technology-review-national-emissions-standards-hazardous (last updated Mar. 16, 2021).

21 EPA, "Fact Sheet: Second Integrated Urban Air Toxics Report to Congress – Progress, and Actions To Address Risks From Air Toxics," (Aug. 21, 2014), *available at* https://www.epa.gov/sites/production/files/2014-08/documents/082114-fs-urban-air-toxics-report.pdf.

22 EPA, "Urban Air Toxics Outreach, and Education," *available at* https://www.epa.gov/urban-air-toxics/urban-air-toxics-outreach-and-education (last updated Feb. 24, 2021).

23 EPA Fact Sheet, "Clean Air Act Section 112(R): Accidental Release Prevention /Risk Management Plan Rule, (Apr. 2020)," *available at* https://www.epa.gov/sites/production/files/2020-03/documents/caa112_rmp_factsheet_march_2020_final.pdf.

24 https://www.epa.gov/national-air-toxics-assessment

25 EPA issued an Advanced Notice of Proposed Rulemaking in 2011 that suggested such an approach under Section 111 of the Act, which also requires periodic technology reviews based on advancements. EPA, "New Source Performance Standards Review: Advanced Notice of Proposed Rulemaking," 76 Fed. Reg. 65,653 (Oct. 24, 2011). Section 112 is largely modeled on Section 111.

Stationary Sources

Introduction

This section addresses the stationary source permitting programs under the CAA, specifically, major NSR, which is comprised of major nonattainment NSR (NNSR) and Prevention of Significant Deterioration (PSD) permitting programs, minor NSR permitting, and Title V operating permits. It also addresses the related NSPS under Section 111 of the Act. It does not include Section 112 programs, as those are addressed in a different section.

Congress established the NSPS program in 1970 to establish a base level of controls for certain categories of emission units to be listed by the EPA. In contrast to NSR programs, NSPS focuses on *industry categories* rather than on pollutants. All new sources in a listed industry category must comply with the NSPS, unless they were already under construction when the standards were proposed. In addition to applying to new sources, NSPS apply to modified and reconstructed sources in a listed source category. The process begins with listing source categories for which the EPA makes certain specified endangerment findings, after which emission standards are set. The EPA has listed hundreds of source categories and issued standards for new sources, which also apply to existing facilities if they are modified or reconstructed. The emission standards are based on the "best system of emission reduction" as determined by the Administrator. The EPA has utilized the NSPS program to regulate GHGs (in the form of carbon dioxide (CO_2) and methane) in recent years from certain source categories. This section of the report does not address the climate change actions because those actions are being addressed in a separate section of this report, dedicated to climate change. Please refer to that section for additional information on climate regulation under the NSPS.

Minor NSR, PSD, and NNSR permitting requirements are all pre-construction permitting programs authorized under Title I of the Act, *via* Sections 110, 165 and 172, respectively. NNSR and PSD apply generally to major sources, and minor NSR applies to both major sources and minor sources. While this report cannot do justice to the scope and complexity of these programs due to the report's limited length, it attempts to highlight the major accomplishments of the programs as well as challenges and opportunities going forward. The preconstruction permitting programs have been in the statute since the 1970s. The Title V operating permit program was added by the 1990 Amendments to the CAA.

NNSR and PSD apply only to major sources and only when certain triggering events occur — *i.e.*, construction of a brand-new facility (*e.g.*, an automobile assembly plant, a chemical production facility) that has the potential to emit over 100 or 250 tpy or a *major* modification of an already major-emitting facility occurs. The underlying policy of these major source and major modification programs is that when significant investment is being made in a facility, that is the best time to install controls so that they can be designed in at the outset rather than retrofitted later, which is as a general matter, always more costly and may not be able to be accomplished as efficiently. NNSR and PSD are typically implemented by state or local agencies, either under an "approved" program or under a "delegation" from the EPA. While in each scenario, the state or local agency issues the permit or determines if a permit is required, a state/local agency with an approved program is implementing its own regulations, which may differ from the federal regulations, but need to, at a minimum, meet those requirements.

PSD applies in attainment and unclassifiable areas and often requires air quality modeling to provide assurance that new emissions being added to the airshed will not cause an area to fall into nonattainment, hence the moniker "prevention of significant deterioration." NNSR applies in nonattainment areas and is intended to allow growth in areas even if they are not attaining a NAAQS, but it imposes certain emission offset requirements, which may require the emissions to be offset at a larger than 1:1 ratio, depending on the pollutant and the severity of the nonattainment problem.

Minor NSR programs are adopted by state, Tribal, and local agencies under Section 110 of the Act. State/Local/Tribal agencies design their minor NSR programs to address local air quality and industry needs and they typically apply below the major source or modification thresholds. Thus, although a new facility may not trigger NNSR or PSD permitting requirements, it will still be subject to the applicability thresholds and applicable additional permitting requirements of the state/local minor NSR program. To the extent that State/Local/Tribal minor NSR rules apply to any permits exceeding certain thresholds, they also apply to major sources.

Title V is different than the NSR programs in that it is an *operating* permit program. Title V does not impose substantive requirements.[26] Rather it collects and lists the substantive requirements from other titles of the Act in a single document, referred to as the operating permit. In general, Title V applies to major sources, as defined in other substantive titles, and as a backstop, it defines a major source as any source with potential emissions of 100 tpy or more. Certain specified non-major sources must also obtain Title V permits. For reference, the EPA summarizes the sources that are subject to Title V permitting on its website. https://www.epa.gov/title-v-operating-permits/who-has-obtain-title-v-permit. The Title V program was launched in 1990 and initially covered some 35,000 sources. That number has declined substantially as companies have undertaken efforts to reduce potential and actual emissions through pollution prevention, changes in technology, and willingness to accept restrictions on operations. The EPA has estimated that this number has been reduced to about 15,500 facilities that remain subject to the Title V program after these emission reduction efforts.[27] Title V also imposes fee requirements on facilities that are subject to the program, which are intended to fund the costs of that program. In general, the presumptive minimum fees required to be collected are based on actual emissions from facilities in an area ($25 per ton in 1990 dollars). States, however, can collect fees in any form they like (*e.g.*, based on allowable emissions, on a per facility flat fee basis, per application, per modification), provided that they establish that their Title V program will be adequately funded and that the fees collected will be used solely for Title V costs.[28] Although Title V does not provide authority to add new substantive requirements, it does provide for new compliance monitoring, recordkeeping, and reporting. It also includes a "petition process," whereby citizens can petition the EPA to object to a Title V permit if it finds that the Title V permit does not comply with applicable requirements of the Act. Finally, Title V requires permittees to submit semi-annual reports of required monitoring and annual compliance certifications.

For ease of review, the successes, challenges, and opportunities are divided based on the Title I permitting programs, under which the EPA has authority to impose new substantive requirements, the Title V operating permit program, through which the substantive requirements established under other titles of the CAA are consolidated and listed in a single document and thus is not a substantive program, and NSPS, through which the EPA can impose emission limits on new (or in some cases, existing) specified types of stationary sources.

Successes

1. Title I Permitting

1.1. States, Tribal authorities, and local agencies implement both delegated and approved NNSR, PSD, and minor NSR programs. This means that almost uniformly across the country, the permitting agencies that are state, Tribal, or local are making the front-line permitting decisions. This is important in the scheme of the statute because Congress intended for a cooperative federalism approach in which there would be local autonomy in making local air quality decisions. Nowhere is this more important than in permitting of economic growth.

1.2. Title I PSD permitting was extended to GHGs following the Supreme Court's decision in 2014, in a manner that was intended not to overwhelm the PSD permitting program. Under this approach, which is often called the "anyway" approach, PSD is triggered for GHGs only when it is already being triggered for a criteria pollutant and there is a significant increase in CO_2-equivalent emissions (with a current significance level of 75,000 tpy CO_2-e).

1.3. The technology-forcing nature of the best available control technology (BACT) (applicable for PSD) and lowest achievable emission rate (LAER) (applicable for NNSR) requirements have helped to advance technology for reducing criteria pollutant emissions.

1.4. To address several criticisms of the NSR programs, the EPA issued the NSR Improvement Rule of 2002, which helped to rationalize and resolve several of these criticisms. Virtually all those regulatory changes were upheld in a court challenge, and states have made substantial progress in adopting those reforms, with the EPA largely approving them.

1.5. The Plantwide Applicability Limit (PAL) provisions of the NSR Improvement Rule built on innovative permits that were issued over the decade preceding that 2002 action. Since 2002, numerous PALs have been issued, and these PALs resulted in substantial emissions reductions over what would have been required under a traditional NSR applicability approach, while simultaneously streamlining the procedural requirements that apply for facilities that do not have PAL permits. Although resource intensive to obtain, PAL permits represent a win-win opportunity for all stakeholders.

2. Title V Permitting

2.1. All States and four Tribal governments have achieved approval of their Title V programs and are implementing them.[29] The federal structure provides consistency and uniformity for the operating permits.

2.2. As of January 2008, 99% of all original permits required for Title V sources had been issued.[30]

2.3. Companies have invested in pollution prevention and new technology to avoid Title V permitting applicability, which means that the number of sources originally projected has been reduced by about 50%. While Title V does not impose substantive requirements, the efforts by companies to avoid the procedural costs of Title V by implementing emission reduction programs to do so is an unintended benefit of the program.[31]

2.4. According to a CAAAC-commissioned investigation into the performance of Title V, which culminated in a 2006 Report to the Committee,[32] a cross-section of stakeholders saw benefits from the Title V operating permit program as including:

2.4.1. Recordation of applicable requirements into one document

2.4.2. Public participation and education

2.4.3. Permitting authority/facility interaction that facilitated communication and understanding of compliance obligations

2.4.4. Strengthened compliance assurance systems, specifically the requirement for annual compliance certifications and semi-annual reports of required monitoring that must identify deviations from permit requirements to facilitate periodic examinations and reporting of compliance status.

2.5. States and the EPA have transitioned to electronic reporting to a large extent, though there remain challenges related to the interaction of federal and state systems (*e.g.*, Compliance and Emissions Data Reporting Interface (CEDRI) v. state-based systems and state systems' inability to accept the federal electronic reporting, creating duplicative reporting requirements), and many states still require duplicative manual submissions.

3. NSPS

3.1. The EPA has issued numerous NSPS emission limitations in the context of multiple source category standards. These technology-based standards apply on an "affected source" basis, which is beneficial in that they are specific to the emissions unit.

3.2. The NSPS standards serve as a baseline for technology determinations in numerous other programs, such as the preconstruction permitting programs, and as a basis for making reasonably available control technology and other determinations under the Act.

Opportunities and Future Challenges

1. Title I Permitting

1.1. There remains a host of guidance, which can be conflicting with other guidance and interpretations, making it difficult for facilities to navigate even the applicability framework, much less to comply with the substantive requirements of the programs.

1.2. Obtaining applicability determinations from the EPA or states is time-consuming and typically out of sync with the timeframe for business decision making.

1.3. The timing for obtaining both major and minor NSR permits is reported as being extremely slow, potentially hampering economic growth.

1.4. There is a lack of available monitoring data for PSD modeling analyses.

1.5. The ever-increasing stringency of NAAQS standards has created substantial challenges for states and facilities in the process:

1.5.1. When NAAQS become more stringent, permits in process may need to start the process over or undergo substantial revisions, and this issue has been exacerbated by court decisions stringently interpreting the language of the statute.

1.5.2. The ability to model attainment or show non-interference has become problematic for pollutants that previously had not presented obstacles to growth.

1.5.3. The lag between issuance of a revised/new NAAQS and the implementation rule leaves states and companies at a disadvantage in planning that needs to be remedied.

1.6. The cost of Title I permitting requirements for modifications is very high, but the data on the emissions reductions achieved and impact on overall air quality may not align with those resources.

1.7. Case precedent on Title V petition processes has created uncertainty for companies and states seeking to rely on Title I permitting decisions.

1.8. Offsets for certain pollutants in many nonattainment areas have been very scarce. In some cases, this means the cost of offsets is extremely high, whereas in others, there may be no offsets available, meaning that a beneficial project cannot proceed or may need to be located at a different location, either domestically or internationally, impacting opportunities for growth and productive capacity expansion in the areas that may have relied on them.

2. Title V Permitting

2.1. The timing for processing Title V modifications and renewals has been reported as excessive and slowing progress on implementing beneficial plant changes.

2.2. While the EPA has made substantial progress in reducing the backlog of Title V petitions, the timing for response to Title V petitions still needs to be reduced.

2.3. Because facilities have substantially reduced emissions, states that base fees on actual emissions have reported struggling with funding. This has caused many states to dramatically increase their permitting fees.

2.4. Inconsistent reporting formats at the federal and state levels have created challenges as the EPA moves to uniform reporting under CEDRI.

2.5. The permit objection process which holds permit terms in limbo pending EPA resolution of objection requests and infrequent or inconsistent use of the permit shield has undermined the ability to achieve the certainty the Title V process was intended to create for companies and for the state permitting authorities that are drafting permits. In exchange for its costs, the Title V program was to create a document on which the source could rely as representing CAA compliance. Where permit objections linger in a state, the permitting authority has uncertainty about whether the permits it is issuing may need to be reopened based on a pending objection for an issue that occurs in all or many of its other permits.

3. NSPS

3.1. The EPA has struggled to complete technology reviews required every 8 years under Section 111(b)(1), which require the agency to "review and, if appropriate, revise" NSPS, unless the EPA "determines that such review is not appropriate in light of readily available information on the efficacy of such standard."

3.2. Current standards, although written as performance standards, may stifle innovation and opportunities for pollution prevention because the standards are written with specific technology in mind and not all NSPS include options for alternative compliance demonstration methods, meaning that a new rulemaking may be required. While the innovative technology waiver is a potential option, because of constraints in the statute on how to qualify for it, it has not been used very often.

3.3. The EPA's process for establishing NSPS may not be nimble enough to help ensure that the emissions from certain source types that fall below permitting thresholds or are not considered in a cumulative manner do not lead to air quality problems. For example, the EPA's process for developing NSPS for the oil and gas sector lagged many years behind the boom in oil and gas production in the late 2000s/early 2010s.

Recommendations

1. Title I Permitting

1.1. The EPA should rationalize and reconcile the thousands of NSR guidance documents to aid understanding of what guidance applies, particularly with respect to the threshold question of applicability or where historic guidance documents present conflicting outcomes.

1.2. While the EPA and the public should continue to have sufficient opportunities to review permits before they are approved, the EPA should take steps to expedite both permits and applicability determinations. To date, the EPA has focused on processing permits that are issued by the EPA as the permitting authority. With respect to Title V, one potential step would be to audit states on their processing times for significant Title V modifications, given the statutory directive to provide for expeditious processing.

1.3. The EPA should continue to encourage companies and states to adopt plantwide applicability limits (PALs). PALs support the purpose of the CAA and the NSR program while providing companies flexibility in how to achieve the level of control required by NSR. The EPA's 2020 PAL Guidance Document represents a good first step in this process, but more can be done to realize the potential of PALs.

1.4. The EPA should take steps to address the problems created by the significant impact level case law.

1.5. Since NSR programs are required to consider revised NAAQS immediately upon promulgation, the EPA should promulgate any related NSR rule changes or issue any related guidance in tandem with a revised NAAQS, even if rulemakings or guidance for other aspects of implementation cannot be issued at the same time.

1.6. The EPA should enhance the air quality monitoring networks to facilitate PSD permitting and should explore public-private partnerships (*e.g.*, as have been instituted in Texas) to support this effort.

1.7. The EPA should conduct a study to assess the relative benefits of NSR permitting compared with the costs and make recommendations as to whether additional streamlining can be done within the current statutory framework.

2. Title V Permitting

2.1. The EPA should work to implement the remaining majority recommendations of the CAAAC's Title V Task Force or explain why it is not proceeding with them.

2.2. The EPA should continue its work to reduce the timeframe for responding to Title V petitions. Over the past four years, substantial progress was made in reducing the backlog that had built up over time. Continued focus will foster further improvement.

2.3. States and the EPA should ensure that appropriate fees are being collected to support the Title V program, which should include ensuring that Title V fees are spent on Title V activities and not broader CAA implementation costs. The EPA should determine the true cost of Title V permitting and provide support for diversification of fee structures, as the presumptive minimum approach is outdated and no longer a sustainable and equitable approach.

2.4. The EPA should work with states to improve processing time for permit modifications.

2.5. The EPA should work with states to improve processing rates for permit renewals.

3. NSPS

3.1. The EPA should make efforts to streamline the technology reviews under Section 111(b)(1). The EPA should review the advance notice of proposed rulemaking that it issued in 2011 on improving the review process and determine if a rulemaking would be appropriate on this topic.[33]

3.2. The EPA should evaluate expanded use of alternative means of emission limitation when it is issuing or revising NSPS.

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26 Copeland, C., *Clean Air Act Permitting: Implementation, and Issues*, Congressional Research Service, at 2 (Sept. 1, 2016) (CRS Report).

27 CRS Report at 1.

28 In the early 1990s, EPA issued an interpretation that would have required states to show that fees would fund all substantive programs of the Act under the statute. Following a legal challenge, that interpretation was withdrawn, and EPA hewed to the statutory language on fees.

29 CRS Report at 3 ("As of June 1997, EPA had approved permit programs for all 114 submissions by states, local agencies, and territories.").

30 CRS Report at 4.

31 CRS Report at 7 ("… Title V is an administrative program and was not intended to have a direct impact on emissions. Permitting agencies, however, say that many major sources have voluntarily restricted their operating conditions or

installed pollution controls in order to reduce emissions below the Title V regulatory thresholds …, which is a plus for the environment.")

32 *Final Report to the Clean Air Act Advisory Committee: Title V Implementation Experience* (April 2006), https://www.epa.gov/caaac/title-v-performance-task-force-report-clean-air-act-advisory-committee

33 *See New Source Performance Standards (NSPS) Review,* 75 Fed. Reg. 65,653 (Oct. 24, 2011).

Visibility and Regional Haze

Introduction

Congress's 1977 Amendments to the CAA established a national program for addressing visibility impairment in national parks, monuments, wilderness areas under what are today sections 162 and 169A (42 USC. §§7472 and 7491). The statute states, "Congress hereby declares as a national goal the prevention of any future and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from manmade air pollution." There are 158 Federally mandated Class I areas across the country, 156 of which have established visibility impairment thresholds.

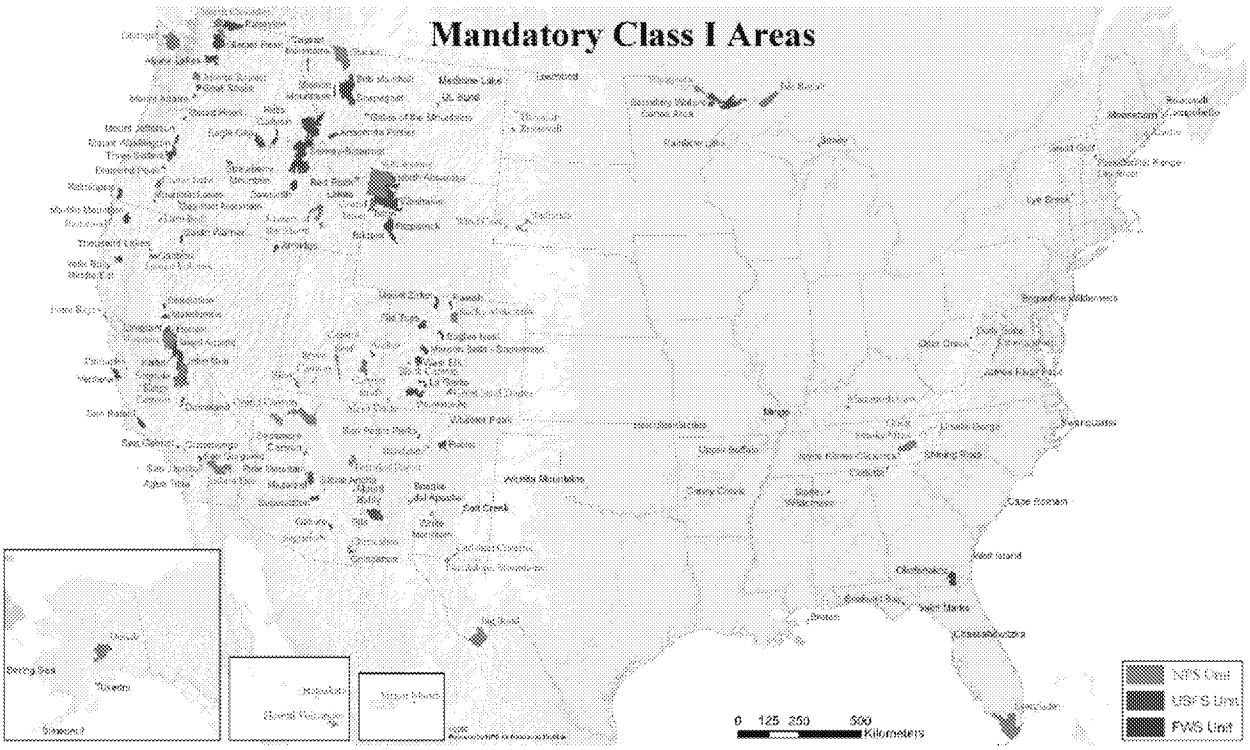

Figure 1. Mandatory Class I Areas

The EPA promulgated the first set of visibility regulations in 1980 that required 35 states and the Virgin Islands to:

1. Revise their SIPs to assure progress toward the national visibility goal.
2. Determine which existing stationary facilities should install the Best Available Retrofit Technology (BART) for controlling pollutants which impair visibility.
3. Develop, adopt, implement, and evaluate long-term strategies toward making reasonable progress toward remedying any existing and future impairment in Class I areas.

4. Adopt measures to assess potential visibility impacts due to new or modified major stationary sources, notify federal land managers (FLMs) of proposals for new or expanded facilities, and consider visibility analyses conducted by FLMs in their permitting decisions.
5. Conduct visibility monitoring in Class I areas.

The EPA added to these provisions in the 1990 Amendments, under what is now section 169B (42 USC. §7492), that requires the EPA to conduct additional research and reporting to Congress and establish a broader regional commission to address visibility issues in Grand Canyon National Park.

In 1999, the EPA adopted the "Regional Haze Rule" to address the issue more comprehensively by evaluating and regulating impacts on visibility across large areas crossing state boundaries.[34] This rule expanded applicability to all states, which meant that an additional 15 states would be required to submit SIP revisions to support regional haze planning. States were required to submit their initial plans between 2006 and 2008 and were required to submit reports on "reasonable progress goals every five years thereafter." A complete revision of the plan was required every 10 years after the initial submission. Under the program, the EPA issued a number of new regulations and guidance documents that further shaped the program ahead of the deadline for states to submit their first regional haze SIP revisions. For example, the EPA established a requirement that states compare visibility conditions in 2000-2004 for the most impaired days with "natural background conditions."[35] States are to use this comparison to determine the amount of progress that is needed to reach these conditions in 60 years, *i.e.,* 2064.[36]

Successes

1. Average visibility in national parks and wilderness areas have significantly improved in the vast majority of areas of the country. This includes both the clearest days and the most impaired days. Figure 2 shows the trends across the country on the worst impaired days from the EPA's 2021 Trends Report.[37] As referenced in the Title IV section, substantial reductions in SO_2, on the order of 95%, have been made in the electric generation sector, along with reductions in NO_x which fell by 88% from 1990 to 2020.[38]
2. The 10 most heavily visited National Parks with visibility monitors all showed notable improvements in visibility on the most impaired days from 2000-2019.[39]

Table 2. Visibility Improvements at Ten Most Visited National Parks, 2000-2019

Park	Visitors in 2020 (Millions)	Visibility Improvement
Great Smoky Mountains, NC	12.3	42%
Yellowstone, WY	3.8	12%
Rocky Mountain, CO	3.3	11%
Grand Canyon, AZ	2.9	22%
Acadia, ME	2.7	33%
Olympic, WA	2.5	19%
Joshua Tree, CA	2.4	23%
Yosemite, CA	2.2	33%
Glacier, MT	1.7	17%
Shenandoah, VA	1.7	44%

3. Across all 183 visibility monitoring stations covered by the Regional Haze Program, the vast majority have seen "significant improvement" (149 sites) and another 13 have shown "possible improvement."
4. These improvements significantly increase the ability of visitors to enjoy the full beauty that these treasured places have to offer.
5. While improvements in visual ranges are due to many different CAA programs, the regional haze program and the emission reduction measures specific to its requirements, such as any measures required under BART, have also significantly contributed to improvements in visibility in these areas.
6. By providing a comprehensive framework for conducting planning around this issue and requiring the input of other federal agencies, including the US Forest Service, US Fish and Wildlife Service, and the US National Park Service, the regional haze program requires that states and the federal government devote attention specifically to this issue at least once every five years, and thereby serves as a reminder to the whole country that this issue remains important.

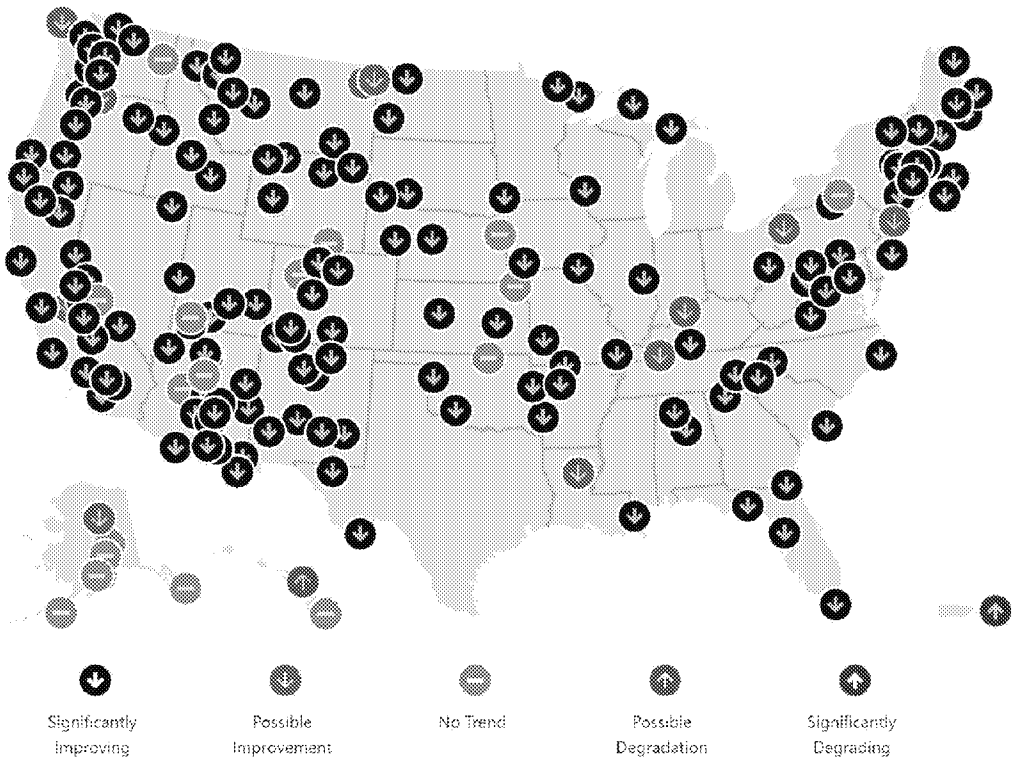

Figure 2. Visibility Trend on Most Impaired Days

Opportunities

1. While the EPA's 2012 PM NAAQS established a distinct secondary annual $PM_{2.5}$ NAAQS related to visibility, the level of the NAAQS is less stringent than the primary annual $PM_{2.5}$ NAAQS and is targeted at urban visibility conditions rather than visibility conditions in Class I areas. With careful consideration of the costs and benefits of such an approach, a similar framework could be used in future reviews of secondary PM, SO_2, and NO_2 NAAQS to support additional visibility improvements in Class I areas with the worst visibility conditions, if existing programs are not meeting the CAA's goals for visibility improvements.
2. EPA modeling indicates that all Class I areas are projected to see improvements in visibility from 2014-2017 to 2028. These improvements are mostly driven by mobile source emissions standards, implementation of the O_3 and $PM_{2.5}$ NAAQS, NSPS, and NSR permitting, providing a good baseline of improvements that would be expected to occur even without additional BART rules.[40]

Future Challenges

1. While most areas have seen improvements in visibility, 21 have not, representing 11% of all monitoring sites.
2. Two sites have seen significant degradation or "possible degradation:"
   2.1. Significant degradation: Virgin Islands NP, 7% degradation 2001-2019
   2.2. Possible degradation: Haleakala NP: 12% degradation 2001-2011
3. One of the motivating factors for the visibility program was not only to improve visibility, but to restore these sites and landscapes to their "natural" condition. Given the extent of long-range air pollution transport, achieving this ambitious goal will be challenging.
4. Since 2006, the EPA has allowed pollution trading programs to fulfill BART emission reduction requirements. This issue continues to be disputed since BART is intended to apply to specific sources tied to impairment in specific Class I areas, while interstate trading programs are designed to address attainment and maintenance of the O_3 and $PM_{2.5}$ NAAQS and would not necessarily address pollution coming from the specific sources identified for a Regional Haze analysis. Courts have upheld the authority of the EPA to consider that interstate rules can provide reductions that are "better than BART," but more recent rules have substantially restricted trading within the CSAPR region. In January 2021, the EPA announced that it would be reconsidering its 2017 decision affirming the ability to rely on the CSAPR to fulfill BART requirements, and as of the writing of this report, this issue has not yet been resolved.

5. The Regional Haze program rules allow states to determine that no additional measures are needed to improve visibility based on cost of implementation, even if modeling showing sources within the state are determined to be having a significant impact on visibility in a Class I area. A state's current program and SIP may also provide more reductions than needed to make "reasonable progress" towards natural visibility conditions. In this situation, when current plans are sufficient or exceed visibility requirements, significant resources are being used by states to prepare and submit SIP revisions and by the EPA to review these SIP revisions, without resulting in any additional actual improvements in visibility. By definition, the program is intended to achieve different types of emission reductions than what are required to attain or maintain the NAAQS, but the program's current implementation can sometimes seem like more of a scientific exercise than a meaningful planning effort designed to achieve additional visibility improvements in Class I areas.

Recommendations

1. The EPA should provide a resource page on its website that provides links to state Regional Haze SIP revisions and the related EPA actions and examples of BART rules that have been adopted by states, along with relevant information about cost, emission reductions expected, etc., comparable across states. This would enhance comparability across all states.

2. The EPA should consider conducting a retrospective analysis of the extent to which improvements in visibility since 2000 can be attributed to BART rules relative to other national programs like the Clean Air Interstate Rule (CAIR), CSAPR, Mercury Air Toxics Standards (MATS), and mobile source emissions standards, as well as state and local programs.

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34 64 FR 35715
35 64 Fed. Reg. at 35,732.
36 *Id*.
37 https://gispub.epa.gov/air/trendsreport/2021/#home
38 https://www.epa.gov/newsreleases/epa-2020-power-plant-emissions-continue-demonstrate-significant-reductions
39 2020 attendance numbers from US National Park Service: https://irma.nps.gov/STATS/SSRSReports/National%20Reports/Annual%20Visitation%20and%20Record%20Year%20by%20Park%20(1904%20-%20Last%20Calendar%20Year) monitoring data from EPA Trends Report. Zion NP had the 3rd most visitors in 2020, but only has monitoring data from 2000-2002. Grand Teton NP, Cuyahuga Valley NP, and Indiana Sand Dunes NP had the 4th, 7th, and 11th most visitors in 2020 but had no monitors.
40 https://www.epa.gov/sites/production/files/2019-10/documents/updated_2028_regional_haze_modeling-tsd-2019_0.pdf

Mobile Sources

Introduction

Assessment of air emissions from mobile sources and initial frameworks to regulate such emissions predate the 1970 CAA. In 1963, Congress amended a 1955 statute which previously required the Surgeon General of the US, in consultation with state and local governments, to "prepare or recommend research programs for devising and developing methods for eliminating or reducing air pollution."[41] The 1963 statute, also known as the CAA, found among other things that "the growth in the amount and complexity of air pollution brought about by urbanization, industrial development, and the increasing use of motor vehicles, has resulted in mounting dangers to the public health and welfare, including injury to agricultural crops and livestock, damage to and the deterioration of property, and hazards to air and ground transportation."[42]

Under the 1963 law, the Secretary of Health, Education and Welfare (HEW) was to "encourage the continued efforts on the part of the automotive and fuel industries to develop devices and fuels to prevent pollutants from being discharged from the exhaust of automotive vehicles."[43] In 1965, Congress approved the Motor Vehicle Air Pollution Control Act of 1965.[44] Pursuant to this authority, the Secretary of HEW promulgated regulations to control hydrocarbons (HC), CO, and crankcase emissions starting with the 1968 Model Year (MY).

Prior to these federal standards, the State of California also acted to control emissions from motor vehicles and motor vehicle engines. Initial standards for HC and CO were promulgated by the California Department of Public Health in 1961; standards for the control of NO_x were added at the end of 1965, applying to the 1966 MY; these standards were then tightened for MY 1970.[45]

The CAA Amendments of 1970, now generally referred to as the 1970 CAA, amended these prior statutes and included provisions to encourage collaborative efforts with states, localities, and industry to research and define approaches to mobile source air pollution. Specifically, the Act required the Administrator of the newly-created EPA to "prescribe (and from time to time revise) . . . standards applicable to the emission of any air pollutant from any class of classes of new motor vehicles or new motor vehicle engines . . ."[46] As described in more detail below, further amendments to the CAA after 1970 expanded the reach of the Act to nearly all engines, vehicles, and fuels utilized for transportation and other uses in the mobile source sector.

In 1977, Congress amended the CAA to provide a waiver mechanism for the State of California of the general preemption of state standards for new motor vehicles and new motor vehicle engines. Section 209(b) of the CAA, as enacted by the 1977 Amendments, allowed CA to receive a waiver if the state standards were "in the aggregate, at least as protective of public health and welfare as applicable Federal standards," and met several other criteria.[47] Under the mechanism, well over 100 separate waivers have been granted by the EPA addressing a range of motor vehicle programs, including CA low emission vehicle programs and more recent zero emission vehicle requirements.[48] Pursuant to CAA section 177, also adopted as part of the 1977 CAA Amendments, other states may adopt standards that are identical to CA standards and approximately a dozen states have consistently done so.[49] The existence of the waiver mechanism in the CAA has allowed states additional flexibility to address mobile source emissions within their borders that may affect the ability to achieve the NAAQS or other air quality goals.

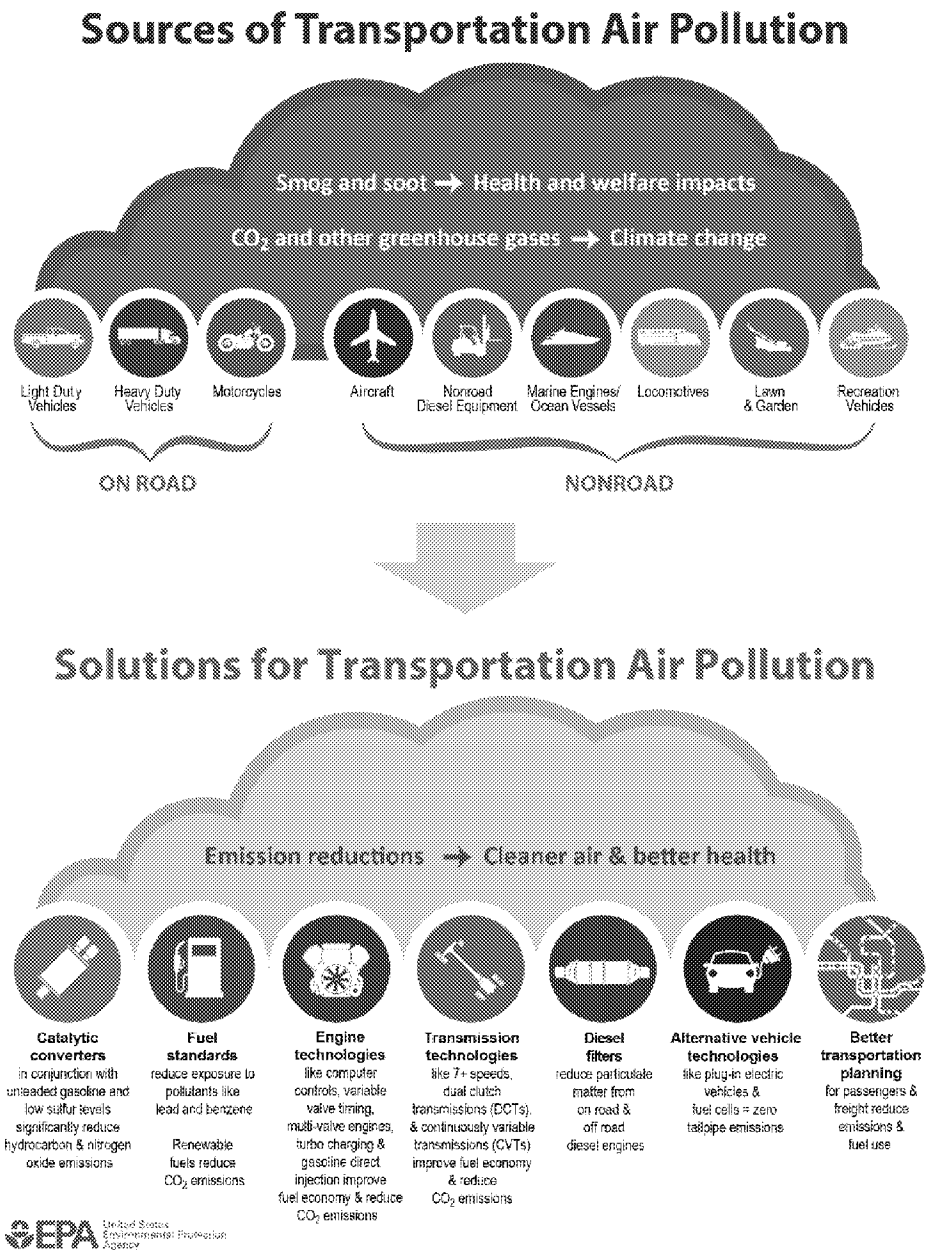

Figure 3. Sources and Solutions for Transportation Air Pollution

CAA authority over mobile sources involves both authority and direction to promulgate emission standards, as well as further definition as to how and how long such standards will apply. In the 1970 CAA, Congress specified that emission standards be applicable to the "full useful life" of motor vehicles and motor vehicle engines. Thus, apart from initial compliance when engines and vehicles are manufactured, standards apply over many years while engines and vehicles are in use and acts subsequent to manufacture may be proscribed.[50]

At times, Congress has been prescriptive as to the extent of emission controls required. The 1970 Act directed the EPA to promulgate regulations to achieve at least a 90 percent reduction in emissions of CO and HC in MY 1975 and a 90 percent reduction in emissions of NO_x by MY 1976.[51] In addition, general authority has been conveyed to the EPA Administrator to enforce engine and vehicle standards, through issuance of a certificate of conformity, and sale or lease of a vehicle was prohibited unless a vehicle or engine was "covered" by such a certificate.[52] The 1970 Act also provided for specific monetary penalties for non-compliance with engine and vehicle regulations[53] and included provisions requiring manufacturers to provide emission warranties.[54]

In 1970, Congress also provided the EPA, for the first time, with authority to regulate fuels and fuel additives.[55] Fuels and fuel additives were required to be registered prior to sale and manufacturers were required to provide the EPA with the name and concentration of additives in fuel as well as the chemical composition of additives.[56] The EPA was also authorized to require tests to determine the potential public health risks of fuels or additives, and the Agency was authorized to promulgate "controls or prohibitions" related to fuels or fuel additives.[57] Finally, the EPA was required to study air pollutants from aircraft and to propose emission standards applicable to "any air pollutant from any class or classes of aircraft or aircraft engines."[58]

In 1977, Congress directed the EPA to prescribe regulations to control CO, HC, and NO_x from heavy-duty vehicles or engines manufactured during and after MY 1979.[59] With regard to CO and HC, a 90 percent reduction was required by 1983.[60] Additional authority was provided to regulate motorcycles.[61] Significantly, the EPA was also directed to study the effects on health and welfare of PM emissions from motor vehicles and engines.[62] In 1990, as part of a broad rewrite of the CAA, Congress addressed nonroad engines and vehicles by requiring a study of emissions from such vehicles and authorized the EPA to set standards for CO, NO_x, and VOC.[63] A separate program was established for locomotives.[64]

With regard to fuels, the EPA promulgated various regulations during the 1970s and 1980s, including controls on lead and other fuel additives, but the 1990 Amendments made it unlawful to sell fuel for use in motor vehicles containing lead or lead additives.[65] The Amendments also required the EPA to promulgate regulations to control evaporative emissions (volatility) from gasoline-fueled vehicles as well as to promulgate regulations for the control of air toxics.[66] The reformulated gasoline (RFG) program[67] was also added to the CAA in 1990 and remains applicable to nine large metropolitan areas having high ozone design values. The 1990 Amendments additionally enacted an oxygenated fuels program requiring specific oxygenated blends to be sold in certain areas to address the formation of CO.[68] Most recently, Congress amended the CAA in 2005 and 2007 to establish the renewable fuels standard (RFS) program, requiring that levels of renewable fuel be added to transportation fuel sold in the US, starting in 2006.[69] This program included statutory levels from 2006 to 2022 for various renewable fuels; after 2023, the EPA is to promulgate regulations based on specified criteria.

As can readily be seen from the history outlined above, the control of mobile source emissions has been a decades-long endeavor, involving complex issues concerning the control of emissions from vehicles and engines and related issues involving fuels and fuel additives. The EPA has promulgated numerous regulations (outlined in more detail below) that considered the impact of vehicles and engines together with fuel while utilizing flexible implementation methods, backed up by extensive testing, certification, recordkeeping, and reporting requirements. These efforts have resulted in quantifiable gains in air quality while also responding to real world conditions, including the manufacturing and market structure for engine and vehicle production and sales, the fuel blending and distribution process, and the need to ensure that vehicles and engines meet emission standards, not only when manufactured, but through their entire useful lives.

Successes

EPA programs to control mobile source emissions have been comprehensive and successful. The EPA's various mobile source programs have far exceeded the original statutory goals that Congress specified in 1970. With regard to "conventional" air pollutants, "compared to 1970 vehicle models, new cars, SUVs, and pickup trucks are roughly 99 percent cleaner for common pollutants (HC, CO, NO_x, and PM). New heavy-duty trucks and buses are roughly 99 percent cleaner than 1970 models."[70]

In 2013, the EPA estimated the combined benefits from then-existing mobile source programs in terms of emission reductions, costs, and projected benefits:

Table 3. Benefits from Mobile Source Programs, 2013

	Light Duty Tier 2	Heavy Duty 2007	Nonroad Diesel Tier 4	Locomotive & Marine Diesel	Ocean Vessel Strategy
NO_x (short tons)	2,800,000	2,600,000	738,000	795,000	1,200,000
$PM_{2.5}$ (short tons)	36,000	109,000	129,000	27,000	143,000
VOC (short tons)	401,000	115,000	34,000	43,000	0
SO_x (short tons)	281,000	142,000	376,000	0	1,300,000
Total Cost (billions)	$5.3	$4.2	$1.7	$0.7	$3.1
Total Monetized Benefits (billions)	$25	$70	$80	$11	$110
Avoided Premature Mortality	4,300	8,300	12,000	1,400	13,000
Avoided Hospital Admissions	3,000	7,100	8,900	870	12,400
Avoided Lost Workdays	700,000	1,500,000	1,000,000	120,000	1,400,000

Specific accomplishments of the mobile source program are outlined in the sections below.

1. Phaseout of Lead in Gasoline

The phaseout of lead in gasoline remains a lasting success of the CAA mobile source program. Through a series of regulatory actions involving both fuel and vehicles, lead levels in gasoline began to decline in the 1970s before reaching an approximate 99% phaseout level by the late 1980s, with lead in gasoline being virtually eliminated in the mid-1990s.[71] These reductions occurred both through requiring the production of "unleaded gasoline," to avoid destruction of the emission control system in new motor vehicles equipped with catalytic converters, and through the resulting fleet-turnover of vehicles that required unleaded gasoline.

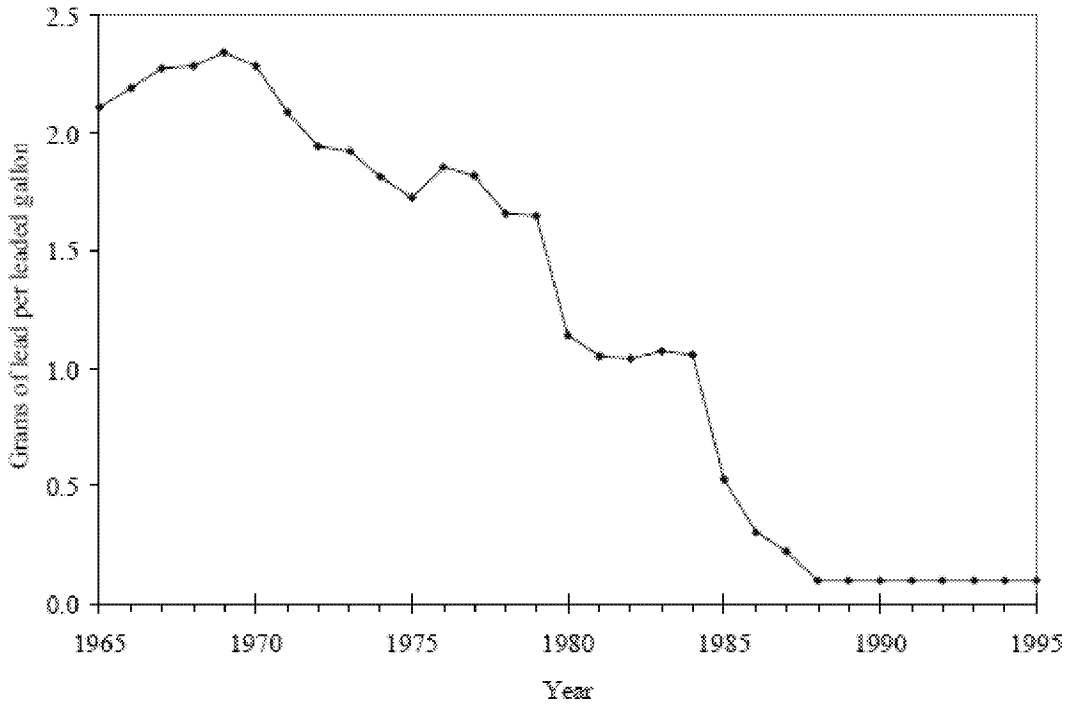

Figure 4. Lead Content in Leaded Gasoline (US Average)

This reduction in lead in gasoline was reflected in a 98% reduction of US children 1-5 years of age with elevated blood levels of lead.[72] In addition, the EPA also estimated that reduced lead levels would reduce the occurrence of hypertension, heart attacks, strokes, and deaths among males 40-59.[73] Estimated net benefits ranged from 1.1 to 6.5 billion per year in 1988.[74]

2. EPA Standards for Light-Duty Vehicles (Conventional Air Pollutants)

As indicated in the overview, the 1970 Act directed specific emission level phase out levels for light-duty vehicles. These were supplemented through additional provisions contained in the 1977 CAA Amendments as well as other legislative actions in 1979 and 1981 to direct the stringency of these emission limits. In 2000, using its general authority under CAA §202(a), the EPA promulgated "Tier 2" standards to reduce the emissions of NO_x and PM from new passenger cars and light-duty trucks starting in 2004 and for heavier vehicles in 2008.[75] In addition, this rulemaking also capped the amount of sulfur allowed in gasoline in order to enable the use and durability of more advanced emission control systems. The EPA estimated the regulations would result in substantial benefits, in terms of avoidance of premature deaths and reduced hospitalizations, as well as welfare benefits related to avoiding crop damage, improving visibility, and decreasing nitrogen deposition.[76]

In 2014, the EPA promulgated Tier 3 standards for light- and medium-duty vehicles as well as some heavy-duty vehicles.[77] These standards further reduced allowable vehicle tailpipe emissions as well as set lower sulfur limits for gasoline, beginning in 2017.[78] More stringent requirements related to evaporative emissions were also included in the final rule. In total, emission reductions were estimated to decrease ozone levels across the country by approximately 1 ppb by 2030[79] as well as decrease carbon dioxide equivalent (CO_2e) emissions from 2.5 to 2.7 million metric tons.[80]

3. EPA Standards for Light-Duty Vehicles (GHG Standards)

In 2010, the EPA and the National Highway Traffic and Safety Administration (NHTSA) promulgated the first emission standards that directly controlled GHGs from light-duty vehicles.[81] These standards were expanded in 2012, to address light-duty vehicles for MY 2017-2025.[82] The standards were projected to result in a net reduction in CO_2 emissions of 27 million metric tons CO_2e ($MMtCO_2e$) in 2020, increasing to a reduction of 569 $MMtCO_2e$ in 2050. Reductions in other GHGs were estimated at 4 $MMtCO_2e$ in 2020 and 47 $MMtCO_2e$ in 2050.[83]

Unlike standards for conventional air pollutants, the GHG standards were not paired with changes to vehicle fuels. Instead, the standards focused on fleetwide g/mile CO_2 emissions as determined with reference to a vehicle's footprint (essentially the area covered between the four wheels of the vehicle). Reductions in CO_2 emissions were primarily based on an increase in the fuel economy of vehicles that were projected to be sold; other GHG reductions were estimated based on changes in air conditioner efficiency and refrigerants as well as relatively small reductions in methane and nitrous oxide.

4. EPA Standards for Medium- and Heavy-Duty Vehicles (Conventional Standards)

The EPA promulgated standards for non-methane hydrocarbons (NMHCs) and NO_x to be applied to heavy-duty compression ignition (diesel) engines and urban buses starting in 1974. Since that time, standards have been progressively tightened. In the early 1980s, the EPA published notices and proposals to further control NO_x and PM from heavy-duty engines, in accordance with the 1977 CAA Amendments. Final rules were adopted in 1985, following litigation.[84] These rules applied NO_x standards to both gasoline and diesel-fuel heavy-duty engines and established the first PM controls for this sector. Other adjustments to these rules were subsequently adopted.

Major additional requirements applying to onroad heavy duty vehicles, still in effect today, were adopted by the EPA in early 2001.[85] These standards were designed to be implemented between 2007 and 2010 and were dependent on rules providing for the production of ultra-low sulfur (15 parts per million (ppm)) in order to allow vehicles to attain a 0.2 grams per brake horsepower-hour limit on NO_x. The 97% reduction in the sulfur content (compared with 500 ppm fuel previously used) was designed to allow diesel vehicles "to achieve gasoline-like exhaust emission levels."[86] Emission reductions by 2030 were projected at 2.6 million tons of NO_x, 115,000 tons of NMHC, and 109,000 tons of PM.[87]

5. EPA Standards for Medium- and Heavy-Duty Vehicles (GHG Standards)

In 2011, the EPA, in coordination with NHTSA, promulgated the first emission standards that directly controlled GHGs from medium- and heavy-duty vehicles.[88] These standards were expanded in 2016 to address medium- and heavy-duty vehicles through MY 2027.[89]

The 2011 standards, known as Phase 1, largely relied on existing engine emission testing protocols to achieve compliance with new CO_2 grams per ton-mile standard. Standards also applied to hydrofluorocarbons from air conditioning systems and also referenced existing N_2O and methane standards.[90] To address the unique requirements of this sector, which are almost universally commercial vehicles designed for multiple end-uses, standards separately applied to combination tractors, vocational vehicles, and heavy-duty pickups and vans, with subcategories for various types of these vehicles. In addition to engine testing, the rule also incorporated use of the GHG Emissions Model (GEM) to simulate the emission impact of various vehicle features.

The 2016 standards, known as Phase 2, essentially built upon the regulatory structure developed for the Phase 1 rules, relying on engine testing and the GEM model for compliance. Additionally, however, the Phase 2 rule promulgated standards that applied to certain trailers used in combination with heavy-duty tractors.[91] Compliance dates for the trailer provisions of the Phase 2 rule, however, are currently stayed due to ongoing litigation.[92] Projected benefits in reduced CO_2 emissions and improved fuel consumption vary with respect to the type of vehicle involved, but the EPA estimated that total vehicle CO_2 reductions from Phase 1 could represent approximately 10% for both downstream and upstream emissions, versus baseline in 2030,[93] with additional HFC reductions. For the Phase 2 rules, the EPA estimated that CO_2 reductions would range from a few percent (compared with baseline) up to a 24 percent improvement in some vehicles.[94]

6. EPA Standards for Nonroad Vehicles & Equipment

Following enactment of the 1990 CAA Amendments, the EPA promulgated the first standards for nonroad diesel engines over 50 horsepower (hp) in 1994, to be phased in from 1996 to 2000.[95] These standards applied to CO, HC, PM, and NO_x, and emission reductions of 27% were forecast by 2010. 1998 standards extended EPA regulations to equipment under 50 hp, while creating "Tier 2," and "Tier 3" standards for all equipment, phased in with regard to the size of engine involved between 2000 and 2008.[96] This rule also extended standards to engines used in smaller (below 50 hp) marine applications. In general, the standards extended relatively the same level of control to nonroad engines as then applied to heavy-duty onroad vehicles.

In 2004, the EPA promulgated Tier 4 emission standards which contained substantially more stringent standards for PM and NO_x.[97] Since the standards utilized new emission control equipment, they were coordinated with stricter standards for diesel sulfur, implementing a 15 ppm sulfur standard in 2010 for nonroad vehicles. The EPA projected that the rules would reduce annual emissions of NO_x by 738,000 tons and PM by 129,000 by 2030.[98] Similar to previous rules, these standards were phased in with regard to engine size and allowed for flexibility mechanisms, such as averaging, banking, and trading (ABT) and the Transitional Program for Equipment Manufacturers. Separately, the EPA has also promulgated regulations for nonroad spark-ignition engines (engines that use gasoline) that cover certain marine engines and small engines below 19 kilowatts (kW) in size.[99]

7. EPA Standards for Locomotives

The EPA promulgated standards applying to manufacturers and remanufacturers of new locomotives and new locomotive engines in 1998.[100] The standards applied to NO_x, HC, CO, and PM, and at the time the rule was promulgated, the EPA projected that the NO_x standards would eventually result in a 60% reduction in such emissions. The EPA subsequently promulgated additional standards for locomotives in 2008 that took effect in 2015.[101] These programs were based, in part, on the development of emission control technology that had been successfully applied to the onroad and other nonroad sectors, and the EPA considered that the 2008 rule completed EPA clean diesel rules for all major diesel sectors, requiring the use of advanced technology.[102] In addition to applying to new engines and equipment, the rules required upgrading of existing equipment when engines are remanufactured. In general, locomotives present unique challenges due to their size, operational characteristics, and long useful life periods. States are also preempted from adopting or enforcing standards or other requirements related to the control of emissions from new locomotives and new locomotive engines.[103]

8. EPA Standards for Marine Vessels

The EPA has adopted a series of emission standards for marine diesel engines over 37 kW (50 hp). The EPA first regulated Category 1 and 2 commercial marine diesel engines in 1999.[104] These standards set levels to control NO_x, HC, PM, and CO emissions. The EPA then took action to regulate "recreational" engines in 2002, applying essentially the same standards to these engines as already applied to engines used in commercial vessels.[105] Additional standards were promulgated in 2003, extending emission controls to much larger ocean-going vessels.[106] The EPA further extended these standards in 2010 by harmonizing US standards with standards adopted by Annex VI to the International Convention for the Prevention of Pollution from Ships.[107] The latter standards are projected to result in an 80 percent reduction in NO_x emissions over time and were coordinated with lower sulfur diesel standards.[108] In addition, the rule defined emission control areas off the US coastline to ensure that both domestic and foreign-flagged vessels meet the rule's NO_x standards when operating within 200 nautical miles off most US coasts.[109]

9. EPA Standards for Aircraft

In late 2020, the EPA Administrator signed the first ever GHG standards applying to certain classes of engines used in civilian subsonic jets and larger propeller-driven airplanes. The rules were published in the Federal Register in January 2021.[110] The standards rely on international standards developed by the International Civil Aviation Organization, which became applicable to global aviation in January 2020 and are phased in for new and existing aircraft types.

10. Fuel and Fuel Additive Standards

As noted above, in many cases, the EPA has coordinated the implementation of new standards applying to engines, vehicles, and equipment with new fuel standards designed to accommodate emission control equipment. This has occurred particularly with regard to sulfur levels in gasoline and diesel, but other fuel parameters (such as volatility) can impact vehicle emissions, including emissions from the fuel tank and other components when the vehicle is not in operation. The EPA has also promulgated extensive regulations to ensure that fuel standards are met, including for the certification and reporting of fuel "batches," and requirements for product transfer documents that accompany fuel from the time it is produced to its sale at retail outlets. Extensive testing and reporting of fuel quality are also required.

This report will not attempt to detail the full extent of fuel and fuel additive regulations promulgated by the EPA since 1970, including their timing and sequencing, but will focus on several major areas of EPA activity using the authority of the CAA. As noted in the overview section, Congress has amended CAA section 211 on several occasions since 1970 to require that the EPA implement specific fuel programs, such as for oxygenated gasoline and renewable fuels. But the following efforts could be considered the major categories where the EPA has successfully used fuel regulations to improve air quality over the last 50 years:

10.1. Fuel Volatility Regulations: The EPA first promulgated regulations in 1989 to place limits on the volatility of gasoline that varied by the area of the country and months involved.[111] These regulations have subsequently been revised, but they are designed to inhibit the formation of ozone during "summertime" periods when both temperature and daylight hours help to contribute to ozone formation. Certain areas are subject to lower Reid Vapor Pressure requirements and other areas and states are allowed, within limits, to prescribe specific limits that vary from federal standards if needed to address air quality issues.[112]

10.2. Reformulated Gasoline: Following enactment of the 1990 Amendments, the EPA promulgated RFG regulations, implemented in two phases in 1995 and 2000.[113] As noted above, the RFG program applies in statutorily designated areas and requires that certain standards apply to gasoline (originally, a 2.0 percent oxygenate level, a 1.0 volume cap on benzene, and prohibition on heavy metals) and that gasoline meet certain performance standards (*e.g.*, no net increase in NO_x emissions). EPA regulations also prohibit non-RFG gasoline from "backsliding" due to implementation of the RFG program.

10.3. Mobile Source Air Toxics: The EPA first promulgated standards to control HAPs from mobile sources in 2007.[114] These standards combined controls on gasoline, passenger vehicles, and portable fuel containers to reduce benzene emissions and other HAPs from vehicle exhaust. The regulations also limited the benzene content of gasoline to an average content of 0.62% with an upper limit of 1.3%. The EPA predicted that the controls would result in reductions of multiple air toxics, reducing cancer risk from mobile sources by 37% as well as result in additional reductions in HC and PM emissions.[115] The EPA predicted that additional reduction in mobile air toxics would occur as a result of the 2014 Tier 3 rule.[116]

10.4. Gasoline and Diesel Sulfur Regulations: As noted elsewhere, the EPA took several steps to limit sulfur in gasoline and diesel in conjunction with new engine and vehicle standards. The diesel sulfur standards were promulgated in early 2001, eventually limiting onroad diesel to 15 ppm sulfur.[117] Gasoline sulfur limits were initially set at 30 ppm, phased in through 2006,[118] and then lowered to 10 ppm in the Tier 3 Rule.[119] In both cases, large immediate reductions in NO_x were predicted to result from the rules along with additional reductions in air toxics, VOC and $PM_{2.5}$.

10.5. Renewable Fuel Standard: Congress amended the CAA in 2005 and 2007 to include annual requirements for the use of renewable fuel in transportation fuel.[120] Starting in 2006, gasoline was required to include renewable fuel, while biomass-based diesel and cellulosic biofuel were allowed to be included in the program. After amendments were adopted in 2007 as part of the Energy Independence and Security Act, volumes for four different types of renewable fuel were specified and statutory volumes specified through 2022 for three of the fuels.[121] In 2023 and later years, the EPA is to establish RFS requirements after evaluating statutory criteria.

Opportunities

Various perspectives on the opportunities for additional criteria and GHG reductions from mobile sources have been expressed. Some commenters cite climate change as most important future focus of mobile source programs, with associated challenges to reduce lifecycle emissions of GHGs through various technological means, including opportunities for vehicle electrification. This perspective would seek to eliminate liquid fuels in favor of emphasizing conversion to all electric fleets for most or all personal and commercial vehicles.

Other commenters cited the nexus between mobile source programs and attainment of NAAQS as well as concerns regarding air toxics. From this perspective, there is the opportunity to make additional gains in local air quality through additional standards, programs for “changeout” of older existing equipment (such as the Diesel Emissions Reduction Act), and other efforts. From this perspective, improved emission performance of existing and new vehicles might be emphasized in the near term as a more cost-effective means of achieving air quality goals, not in lieu of lowering GHG emissions through existing standards that are applicable through the middle part of the 2020s, but in conjunction with such programs to achieve both criteria and GHG emission reductions over a longer timeframe.

In this regard, the EPA published an Advance Notice of Proposed Rulemaking for new heavy-duty engine standards in January 2020,[122] but to date, the Agency has not proceeded to the proposed rule stage, despite internal work on this proposal dating back several years. And while the EPA announced last year that it expected a proposed rule in early 2021, the Agency now indicates that such a rulemaking is a "long-term" action. This raises the prospect that the opportunity to achieve greater NO_x reductions affecting attainment of ozone standards could be delayed.

Other views have been expressed concerning how EPA standards and programs could better serve to incentivize private sector investment, *e.g.*, through recognition of "early adopters." In the past, the EPA has utilized incentives within mobile source programs to provide for additional credits or the ability to earn credits as against a future standard. Such programs offer the opportunity to harness private sector investment and spur the development of technologies which could eventually have wide application within vehicle fleets.

Additional opportunities lie with respect to testing and compliance over useful life periods. In recent years, the EPA has stepped up enforcement with regard to "defeat devices," elevating this concern to a National Compliance Initiative. The EPA also rewrote 40-year-old guidance regarding tampering.[123] But, given the prevalence of these issues, a reasonable opportunity would lie for additional efforts to review certification testing (including durability) as well as in-use testing. Gains have been made with respect to portable emission monitoring equipment, and states have pioneered other efforts, but fundamentally, if emission performance cannot be maintained over time, EPA and state projections concerning modeled attainment will be jeopardized, and attainment of air quality standards will be made more difficult.

In this regard, technology may offer additional opportunities with respect to vehicle inspection and maintenance (I/M) programs. The CAAAC is well aware of the difficulties experienced with past I/M efforts, particularly with respect to requirements imposed during the 1990s. But technology has advanced, allowing for potential options that may offer increased efficacy, along with less burdensome requirements for state programs.

Finally, other opportunities lie in this area related to EJ and social equity issues, *e.g.*, with regard to access for all socio-economic levels to new technology and related infrastructure. Consideration of these concerns may occur both during initial review of problem identification and policy options as well any subsequent regulatory process.

Given the diversity of views across all issues, this report seeks to identify underlying issues with utilization of the CAA to continue to progress already made in the reduction of mobile source emissions.

Future Challenges

The 1970 CAA provided the EPA with authority to address emissions from mobile sources, including engines, vehicles, and fuels. But as indicated above, in several instances since that time, Congress has amended the Act to specifically require various programs. For example, the 1990 Amendments directed the promulgation of new standards for light-duty vehicles, added a new subsection for mobile air toxics, and included the RFG and wintertime oxygenate programs. One common denominator in these enactments following the 1970 CAA was that Congress sought to address specific issues related to engines, vehicles, and fuels. For example, the RFG program was targeted at large urban areas with high ozone levels, while the wintertime oxygenate program was designed to address CO. The RFS program, enacted in 2005 and expanded in 2007, was designed to increase the use of renewable fuel in transportation fuel as measured by lifecycle impact on GHGs.

In terms of the CAAAC's review, it is clear that the EPA has authority to address GHGs from mobile sources under CAA section 202, but the precise boundaries of this authority are not yet defined. The EPA may promulgate standards "applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines" after considering several factors.[124] The EPA also has authority to require the use of renewable fuels. But it is far less clear what authority the EPA possesses in the area of any fueling (or charging) infrastructure that might be necessary to accommodate different types of vehicles, such as zero emission vehicles, that have been advocated to address climate change.

In addition, an issue raised during the discussion of EPA authority by the CAAAC noted the differences between EPA authority to regulate air emissions and NHTSA's authority to address fuel efficiency and whether such authorities could be "decoupled." In prior rulemakings, the EPA has sought to coordinate its standards with NHTSA in order to advance "one national program." Most recently, however, the EPA and NHTSA have not acted together within one rulemaking document, while asserting that their separate actions are being accomplished on a coordinated basis.

While it may in some cases be strategically advantageous for the EPA to *not* define precise limits on its statutory authority – the issue of climate change was described by some CAAAC members as constituting an existential threat. Therefore, it would be advantageous for the EPA to define the extent of its CAA authority to mandate that certain engine and vehicle technologies be utilized, versus setting standards that are technologically neutral. This would give the public and industry a clear understanding of the extent to which the EPA can utilize its authority to reduce carbon emissions from engines and vehicles.

This is not an academic question. As noted elsewhere in this report, litigation regarding issues of the extent of EPA authority with regard to stationary sources under CAA section 111 has effectively delayed standards applicable to electric power generating units (EGUs) for a decade, and litigation in this area continues. Thus, on the whole, the EPA should evaluate whether it would be preferable, in terms of public policy and long-term objectives regarding climate change, to assess its authority over GHG emissions from mobile sources upfront.

Recommendations

1. Extent of CAA Authority and Options Available Under that Authority

1.1. The EPA should review its available authority, or lack thereof, to mandate the sale of specific vehicle types, *e.g.*, electric or hydrogen vehicles, versus setting standards similar to those adopted in the past that are based on projections of available technology, costs, and potential market adoption of various approaches to control vehicle emissions. This should not remain an open question, addressed only in the context of individual rulemaking, but should be considered a threshold issue by the Agency for which public discourse is necessary. Specifically:

1.1.1. If the EPA considers it has such authority, what limits, if any, would apply?

1.1.2. If the EPA considers it lacks sufficient authority, what legislative authority would the EPA or other departments or agencies of the federal government require?

1.2. The EPA should also define its authority under the CAA, if any, to address related vehicle infrastructure issues associated with greater adoption of electric, hydrogen or other alternative-fueled vehicles. Again, such work should precede and inform the public debate on these issues, rather than be explored subsequent to the allocation of resources for such efforts. Issues that should be analyzed include:

1.2.1. How the EPA will seek to avoid picking technological "winners" and "losers" when utilizing its authority under the CAA.

1.2.2. What the relevant sequencing of any public investments may be in terms of the availability of products produced by the private sector.

1.2.3. The relative efficacy of incentives versus mandates for infrastructure investment and the likelihood and extent of private sector investment.

1.3. The EPA should develop the necessary analytical infrastructure to assess the relative impact of different vehicle types on the generation of GHGs more precisely.

1.3.1. Additional attention should be paid to full lifecycle GHG assessments of different options, including any necessary related infrastructure.

1.3.2. The Agency needs to address how it will assess the potential costs and benefits of alternative technologies, with the costs and benefits that may be associated with its previous approach emphasizing increased fuel efficiency. This assessment should be done over a range of different timescales, *e.g.*, 2020-2030, 2030-2040.

1.3.3. Concurrently, the EPA should address EJ issues associated with access to new technology vehicles and infrastructure. What authority would be available to the EPA, if any, with respect to the location and "affordability" of new technology/infrastructure?

1.4. The hallmark of EPA motor vehicle regulations has been the use of compliance flexibility through various mechanisms, including emission credits and ABT. These mechanisms have been used, along with incentives for different technologies, within the light-, medium-, and heavy-duty GHG rules that have been promulgated. How can the EPA utilize this past experience as it approaches new rulemakings?

1.5. How will the EPA seek to balance mobile source issues versus issues related to the regulation of other sources of GHGs under the CAA? What common metrics are available and appropriate for this purpose, and what are the analytical limits, if any, of existing cost/benefit mechanisms? (*See* 2.5.1-2.5.3 below)

2. Addressing Local, Regional and Global Air Quality Issues

As noted extensively above, the EPA has promulgated Title II regulations to address numerous air quality issues, including NAAQS attainment, reduction in air toxics, and reduction in the emission of ozone depleting substances. As reductions from stationary and other sources have been implemented, the overall contribution of mobile sources and stationary sources to air quality issues has shifted over time. In addition, the relative contributions of different sources will vary from area to area. An evaluation of 17 mobile source sectors to ambient ozone and PM levels across the US indicated summertime ozone contributions of between 2 and 5 ppb (found largely in the Southeast) and annual average $PM_{2.5}$ concentrations of between 0.5 and 0.9 ug/m^3.[125] The EPA should evaluate several areas:

2.1. How can the EPA effectively balance the needs to attain local and regional air quality goals with the global issues inherent in addressing climate change?

2.2. To what extent do synergies exist, not exist, or potentially produce contradictory outcomes in addressing local and regional air quality versus global climate change?

2.3. How should the EPA balance both short-term and longer-term health risks associated with localized air pollution versus climate change in terms of overall priorities for the mobile source program?

2.4. How can the EPA integrate its programs with other likely investments occurring outside the CAA by private industry and federal, state, and local programs?

2.5. Similar to questions posed for GHG programs, how can the EPA best preserve compliance flexibility mechanisms that it has successfully used in engine, vehicle, and fuel programs? For example, mobile source programs have used the following mechanisms that the EPA should evaluate for utilization in future programs:

2.5.1. Staggered implementation deadlines based on technological and economic analysis concerning necessary time periods for developing and deploying requisite technology.

2.5.2. Incentive programs, *e.g.*, for advanced technologies, innovative technologies, that allow for the generation of credits.

2.5.3. Compliance flexibility, *e.g.*, the ability to utilize "off-cycle" emission reductions for vehicle certification, ABT programs, fleetwide compliance and scaled requirements based on vehicle size (light-duty programs) and vehicle type, and utilization (medium- and heavy-duty programs).

3. Additional Issues

3.1. The EPA issued an ANPRM in January 2020 regarding new standards for heavy-duty vehicles, but to date has not taken further steps to propose new standards for these vehicles, in particular, new standards for NOx emissions. In addition, the last comprehensive federal rule to address nonroad vehicles was promulgated in 2004. While the EPA has apparently devoted substantial resources to the light-duty vehicle sector, including with respect to associated electrification efforts, additional priority should be given to addressing "conventional" air pollutants from medium- and heavy-duty vehicles as well as appropriate segments of the nonroad sector. A key consideration in this area is also with respect to national uniformity, given that the vast majority of the medium- and heavy-duty sector consists of commercial vehicles.

3.2. As noted above, I/M programs are important to ensure that in-use vehicles continue to meet standards to which they were initially certified. While I/M programs are not part of the authority conveyed to the EPA under title II of the CAA, the Agency should review and consider what new technology may be available to "enhance" I/M programs and their ability to ensure that vehicles maintain compliance for their full useful lives. A review of existing I/M SIP rules may also be useful, such as updating references to 1990 Urbanized Areas, to help state and local planners better understand what would be required for a new program. The EPA must certainly be mindful that past programs experienced difficulty, but cost-effective solutions may be available to avoid overly burdening states and the public while maintaining effective compliance with emission standards.

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41 42 USC. §1857a(a). 69 Stat. 322, Ch. 360 §1 (July 14, 1955). Congress authorized $5 million for such research, and expressed a policy "to preserve, and protect he primary responsibilities, and rights of the States, and local governments in controlling air pollution, to support, and develop methods of abating such pollution, and to provide Federal technical services, and financial aid to State, and local air pollution control agencies, and other public or private agencies . . ." *Id.* at §1857

42 Pub. Law 88-206, 73 Stat. 646, Sec. 1.

43 *Id.*, Sec. 6(a). A technical committee was established, and report to Congress required on "measures taken toward the regulation of the vehicle exhaust pollution problem, and efforts to improve fuels." *Id.*

44 Pub. Law 88-206.

45 *See* Cal Code Regs. tit. 17, 30520, Register 64, No. 22.

46 81 Stat. 499, Sec. 6. This authority was located within section 202(a) of the Clean Air Act, and remains, in substantial form, in law today.

47 Pub. Law 95-95, Sec. 207; *see* CAA section 209(b)(1)(A)-(C).

48 *See* epa.gov/state-and-local-transportation/vehicle-emissions-california-waivers-and-authorizations.

49 A total of 14 states have adopted the California low emission vehicle and GHG regulations; 11 of these states have adopted the California zero emission vehicles program. *See* ww2.arb.ca.gopv/sites/default/files/2021-08/177_states_080521.pdf.

50 For example, tampering with vehicle emission control systems is prohibited along with the manufacturing or sale of any component that would have a principal effect of bypassing or "defeating" emission control systems. See CAA §203.

51 *Id.*, CAA §202(b).

52 *Id.* CAA §203(a)(1).

53 *Id.* CAA §205.
54 *Id.* CAA §207.
55 *Id.* CAA §211.
56 *Id.* CAA §211(a)-(b).
57 *Id.* CAA §211(c). States were preempted from prescribing or enforcing controls or prohibitions on fuels or fuel additives for the purposes of emission control, although a waiver process was allowed for the State of California. *See* CAA §211(c)(4).
58 *Id.* CAA §231. Enforcement of such standards, however, was delegated to the Secretary of Transportation. CAA §232.
59 Pub. Law 95-95, Sec. 224 (Aug. 7, 1977).
60 CAA §202(a)(3).
61 CAA §202(a)(3)(F).
62 CAA §214(a).
63 CAA §213. The nonroad engine, and vehicle category includes a wide range of vehicles – from mammoth "earth movers" down to lawn, and garden equipment.
64 213(a)(5). Similar to onroad standards, separate state standards for nonroad engines, and equipment were preempted, subject a process for a California waiver for new engines, and equipment apart from locomotives, construction, farm or 175, and less horsepower equipment or vehicles.
65 CAA §211(n).
66 CAA §211(l).
67 CAA §211(k).
68 CAA §211(m).
69 CAA §211(o).
70 *See* https://www.epa.gov/transportation-air-pollution-and-climate-change/accomplishments-and-success-air-pollution-transportation.
71 EPA's first regulations in this area were promulgated in 1973. 38 Fed. Reg. 1,254 (Jan. 10, 1973); 38 Fed. Reg, 33,734 (Dec. 6, 1973). EPA also promulgated a rule in 1996 following enactment of Section 112(n) of the Clean Air Act in 1990, 61 Fed. Reg. 3,832 (Feb 2, 1996). This rule imposed a general prohibition on the sale of any gasoline for use in a motor vehicle containing more than 0.05 grams of lead per gallon. For an analysis of these phasedown steps see "The US Experience with the Phasedown of Lead in Gasoline, Richard Newell, and Kristian Rogers, Resources for the Future, June 2003. Today, the only remaining use of lead in gasoline involves aircraft.
72 Third National Report on Human Exposure to Environmental Chemicals. Centers for Disease Control, and Prevention, National Center for Environmental Health; 2005. Publ. No. 05-0570.
73 Costs, and Benefits of Reducing Lead in Gasoline: Final Regulatory Impact Analysis, US EPA 1985.
74 Resources for Future at 29, citing 1985 EPA supplementary analysis.
75 65 Fed. Reg. 6,698 (Feb. 10, 2000).
76 Regulatory Impact Analysis, EPA420-R-99-023, December 1999 at v.
77 79 Fed. Reg. 23,414 (Apr. 28, 2014).
78 Fleet standards were applied requiring a staged reduction in emissions of non-methane organic gases (NMOG)+NO_x as well as new per-vehicle standards for PM.
79 Control of Air Pollution from Motor Vehicles: Tier 3 Motor Vehicle Emission, and Fuel Standards Final Rule, Regulatory Impact Analysis at ES-7.
80 *Id*.
81 75 Fed. Reg. 25,324 (May 7, 2010).
82 77 Fed. Reg. 62,624 (Oct. 15, 2012).
83 Regulatory Impact Analysis: Final Rulemaking for 2017-2025 Light-Duty Vehicle GHG Emission Standards, and Corporate Average Fuel Economy Standards at 4-133.
84 50 Fed. Reg. 10,606 (Mar. 15, 1985).
85 66 Fed. Reg. 5,002 (Jan. 18, 2001).
86 Id.
87 Id.
88 76 Fed. Reg. 57,106 (Sept. 15, 2011).
89 81 Fed. Reg. 73,748 (Oct. 25, 2016).
90 NHTSA promulgated fuel efficiency standards of comparable stringency.

91 81 Fed. Reg. at 73,481.
92 Truck Trailer Manufacturers Association, Inc. v. EPA, No. 16-1430 (D.C. Cir.).
93 Final Rulemaking to Establish GHG Emission Standards, and Fuel Efficiency Standards for Medium-, and Heavy-Duty Engines, and Vehicles, Regulatory Impact Analysis at 5-13.
94 GHG Emissions, and Fuel Efficiency Standards for Medium-, and Heavy-Duty Engines, and Vehicles – Phase 2, Regulatory Impact Analysis at ES-15.
95 59 Fed. Reg. 31,306 (June 17, 1994).
96 63 Fed. Reg. 56,968 (Oct. 23, 1998).
97 69 Fed. Reg. 38,958 (June 29, 2004).
98 Id.
99 60 Fed. Reg. 34,581 (July 3, 1995); 64 Fed. Reg. 24,268 (Apr. 25, 2000); 73 Fed. Reg. 59,034 (Oct. 8, 2008).
100 63 Fed. Reg. 18,978 (Apr. 16, 1998).
101 73 Fed. Reg. 37,096 (June 30, 2008).
102 Id. at 37, 097.
103 40 C.F.R. §1074.12
104 64 Fed. Reg. 73,300 (Dec. 29, 1999).
105 67 Fed. Reg. 68,242 (Nov. 8, 2002).
106 These standards applied to Category 3 marine diesel engines, or ocean-going vessels such as container ships, tankers, bulk carriers, and cruise ships.
107 83 Fed. Reg. 22,896 (Apr. 30, 2010).
108 EPA applied a 1,000 ppm sulfur limit to diesel fuel used in these vessels in order to displace much higher sulfur levels contained in bunker fuel.
109 *See* 83 Fed. Reg. at 22,923.
110 Control of Air Pollution from Airplanes, and Airplane Engines: GHG Emission Standards, and Test Procedures, 86 Fed. Reg. 2,136 (January 11, 2021).
111 54 Fed. Reg. 11,868 (Mar. 22, 1989).
112 42 USC. §7545(c)(4)(C).
113 59 Fed. Reg. 7,716 (Feb. 16, 1994).
114 72 Fed. Reg. 8,428 (Feb. 26, 2007).
115 *Id.* at 8,430.
116 81 Fed. Reg. at 23,624.
117 70 Fed. Reg. 70,498.
118 65 Fed. Reg. 6,698 (Feb. 10, 2000).
119 79 Fed. Reg. 23,414 (Apr. 28, 2014).
120 Pub.L. 109-58 (Aug. 8, 2005), Pub.L. 110-140 (Dec. 19, 2007); 42 USC. §7545(o).
121 Specific volume requirements for biomass-based diesel ended in 2012.
122 85 Fed. Reg. 3,306 (January 21, 2020).
123 EPA Tampering Policy: The EPA Enforcement Policy on Vehicle, and Engine Tampering, and Aftermarket Defeat Devices under the Clean Air Act, Nov. 23, 2020.
124 *See*, e.g., 42 USC. §7521(a)(2), (a)(3).
125 Mobile Sector Source Apportionment – Air Quality, and Benefits Per Ton, Zawacki, M., Baker, K.R., Phillips, s., Davidson, K, Wolfe, P., 2018.

Developing and Utilizing High Quality Data

Introduction

The study of air quality is essential to maintain human health and the environment. The ability to measure air pollution can provide information that can help in understanding the sources of it and implementing measures to reduce or eliminate it. Verified air quality data meeting regulatory protocols is also central to the operation of the air quality management systems established by the enactment of the 1970 CAA. Air quality data determines the attainment status of an area as well as the requirements of the CAA that apply to states and emission sources.

Understanding air quality and its effect on human health and the environment requires the development and maintenance of high-quality data. This data allows for a deep understanding of the sources, formation, and impacts of air pollution. Air quality data also allows for the projections or forecasting of related impacts. One example of this is the air quality index that provides citizens with vital information about the air quality in their community.

The EPA provides an important role in the collection and maintenance of air quality data. EPA regulations define data that is utilized for determining attainment status and for measuring source compliance with various CAA programs. Air quality data is also utilized to support assessment of the health impacts of various pollutants as well as other impacts on the environment (*e.g.*, deposition to land and water).

Air quality data also is central to risk communication. For example, the EPA has created and maintains AirNow, which provides access to outdoor air quality data collected from state, local, and Tribal monitoring agencies across the US. The EPA publishes air emissions factors and compiles emissions inventories submitted by states every three years. This shows which sources emit how much pollution and support air quality modeling efforts. The EPA publishes an electronic reporting tool that sources can use to report stationary source emissions sampling test data to regulatory agencies.

States and the EPA also conduct air pollution deposition monitoring to assess progress under the CAA (*e.g.*, with regard to acid rain and nitrification). This data also supports publication of the EPA's periodic trends reports on air quality, and information on air emissions in the US over time represents one of the best and longest-running environmental trends assessments in the world. For GHGs, the EPA's GHG Reporting Program, in operation now for over a decade, provides a detailed understanding of where GHG emissions are emitted and in what quantities. This information will improve the ability of policymakers and the public to make informed policy, business, and regulatory decisions.

Successes

1. The EPA's NEI provides a comprehensive picture of the emissions from all sources across the country and is a critical tool for understanding emissions and their relationship with ambient air quality.
2. EPA collection of data on the costs and other logistical considerations for implementing pollution control technologies and other measures provides an important planning tool for states, Tribes, local governments, and business.

3. Ambient air quality monitoring networks constantly measure and evaluate the status of air quality and provide information to regulators, scientists, industry, and the public. Ambient monitoring data is used to determine where air quality standards are being achieved, assess trends in air quality, and assess the impact of pollution generated by various activities.
4. Stationary source (*e.g.*, businesses, factories, power plants, etc.) emission monitoring and reporting provides data and information from a regulated stationary source, or facility, to demonstrate compliance with certain regulatory requirements in Federal or State rules. These emissions inventories are an important tool for air quality planning efforts and scientific research on air quality. Additionally, stationary source monitoring provides useful information to the facility operator about the performance of the facility so corrective action can be taken, where necessary.
5. Emerging low-cost sensor monitoring allows for greater access to data that can be used to locate pollution hotspots, identify sources of pollution, supplement fixed-site monitoring data, measure personal exposure to pollutants, educate, and enhance air quality awareness.
6. Advances in remote sensing technology provide information about spatial variation in exposure patterns, allow for identification of hot spots, and provide data used to enhance and refine meteorological models.
7. Scientific research efforts have led to major advances in air quality issues that have improved understanding of air pollution *e.g.*, formation, behavior, and chemistry, including secondary reactions, allowed for development of emissions inventories, created new methods for detecting air pollution, and refined models used to predict air pollution.
8. Advances in data collection and storage as well as methods for display and sharing have reduced burdens and increased accessibility of air quality data to the public.

Opportunities

1. New sensor technology to measure air pollution as well as remote sensing technology offer the opportunity, with EPA guidance on appropriate use, to be integrated with ambient monitoring networks to provide for a more robust monitoring network across the country.
2. New sensor technology as well as remote sensing technology can be used to validate models, support emissions inventories, and provide access to information about air quality where monitoring data acquired through other methods, such as Federal Reference monitors, is not available.
3. The EPA should explore the availability of such advanced technologies for measurement of air pollution and whether such can be incorporated into NAAQS reviews of health and welfare standards, if sufficiently validated. For example, the EPA could consider or seek out epidemiological studies that use new sensor data for different pollutants and evaluate whether they could be utilized during the NAAQS review process.
4. The EPA should also evaluate whether it could use data from sensors in conjunction with its existing air quality monitoring and modeling system to estimate exposure in unmonitored areas.

5. The EPA's required five-year monitoring network assessments and review of annual monitoring network plans can be better used to collect the highest-priority data, especially with respect to support EJ considerations. For example, the EPA could require explicit consideration of establishment of an adequate state/Tribe/local government monitoring network to monitor ambient air quality in areas that score high on the EPA's EJSCREEN tool and prioritize the siting of monitoring stations in these areas or revise its network regulations to require a minimum number of EJ-based sites.

6. Accessibility to data has increased over the years (*i.e.*, AirNow, GHG emissions, the National Emissions Inventory, Clean Air Markets Division, etc.) and can continue to grow. But there is further opportunity here for data integration and data translation in order to increase the public's understanding of this data and its meaning. Considerable room for improvement exists in communicating with the public in a meaningful way.

7. Advances in technology and assessment techniques, such as refined surveys, can allow for development of more precise emission factors to aid in development of emissions inventories and provide the most up-to-date information to facilities who rely on this data.

Future Challenges

1. Much of the funding for the ambient monitoring networks operated by states, Tribes, and local governments is provided by the federal government through the section 105 grant program, but funding levels have remained at stagnant levels for many years. This has resulted in agencies relying on outdated equipment and not being able to afford efficiency updates (*i.e.*, remote operations of networks/instrumentation).

2. While newer technologies are available to aid in the development of NAAQS, they are often not well funded, and appropriate data collection systems are not made available. The EPA explicitly pointed to a lack of available monitoring data for ultrafine particles and speciated $PM_{2.5}$ as factors constraining their ability to conduct health assessments for different types of PM during the most recent PM NAAQS review. Where states, Tribes, and local governments expended extra effort to develop systems, the EPA has not always used the data for NAAQS reviews.

3. There is greater access to instrumentation and data that can aid in air pollution detection, measurement, and communication, but its capabilities and use are undefined from a regulatory perspective. For example, satellite air pollution measurements are widely recognized; however, the EPA has not developed a comprehensive policy regarding how they can be used in various contexts, *e.g.*, in relation to regulatory uses and required monitoring.

4. New technologies have been developed that can greatly enhance and aid compliance reviews (*i.e.*, infrared cameras and other optical systems, fence-line monitoring with sensors), but they are often too expensive for agencies to utilize and are not funded. Additionally, many agencies do not have appropriate understanding of the ability to use such systems with regard to regulatory compliance or other uses.

5. Many of the emission factors in use are outdated and inaccurate and may not be appropriate for certain sources of emissions (*i.e.*, natural gas fired dryers, printing operations). This information is needed for many focus areas, including setting priorities for reducing air pollution, rule development, compliance monitoring, compliance assurance, and enforcement.
6. Collecting the data needed for exceptional events demonstrations and assessing the impacts of international emissions and photochemical modeling required for SIPs can be extremely resource-intensive for states, Tribes, and local governments.
7. As the EPA considers lower NAAQS, it is essential that instrumentation, models, and other tools used to demonstrate attainment with the NAAQS are able to perform at lower levels.

Recommendations

1. Ambient Monitoring

1.1. Request More Funding for Monitoring: The EPA should request additional funding from Congress for state/local/Tribal monitoring to appropriately consider the cost of funding a modernized monitoring network.

1.2. Address NAAQS Monitoring Requirements: The EPA should consider revising monitoring requirements to focus on pollutants for which achieving attainment or maintaining the NAAQS is more challenging. An example of this includes streamlining monitoring for CO and NO_2, for which the standards are broadly being met.

1.3. Increase Funding for Community Monitoring: The EPA should improve and increase funding opportunities to organizations for the purposes of community monitoring, in accordance with monitoring objectives and stated EJ goals. The EPA must accompany this funding with specific resources on quality assurance of data, as well as comparison to federal regulatory requirements.

1.4. Increase Ultrafine and Speciated PM Monitoring: The EPA should fund and then require additional ultrafine and speciated particle monitoring to better characterize the state of particulate attainment. Additionally, the EPA should establish data handling procedures to utilize these types of monitoring to support PM NAAQS reviews.

1.5. Take Ownership of Expertise in Sensor Technology: The EPA should maintain and expand expertise in sensor technology and continue to develop useful information about performance targets, accuracy, and interpretation of results. The work of the South Coast Air Quality Management District is groundbreaking, and the EPA's "Air Sensor Toolbox" should be expanded to incorporate more sensor information to be a one-stop-shop. This will provide citizens, the regulated community, and air agencies valuable assistance in understanding and utilizing sensor technology.

1.6. Improve Understanding of Remote Sensing Measurements: The EPA should partner with researchers to better understand remote sensing measurements, especially satellite air pollution measurements, and how they compare to ground-based ambient measurements.

1.7. Help Document Large-Scale Exceptional Events: The EPA should proactively assess the occurrence of larger exceptional events each year, such as large wildfire events, and flag data that might have regulatory significance as potentially affected by an exceptional event. Consistent with current guidance, the EPA should still provide states the opportunity to flag data for consideration as exceptional events, beyond those that the EPA may have flagged.

1.8. Improve Utility of 5-Year Monitoring Network Assessment: The EPA should consistently engage in the 5-year monitoring network assessment process, including developing more guidance to help ensure the assessment is useful across more applications (*i.e.*, EJ).

2. Emissions

2.1. Conduct a Comprehensive Review of Emission Factors: The EPA should undertake a comprehensive review of emission factors and ensure that adequate resources are allocated to periodically update these factors to account for the best available information that accurately reflects emissions from each source, including but not limited to conducting a statistically significant survey or testing of emission sources.

3. Data Integration and Availability

3.1. Conduct a Comprehensive Review of EPA Databases: The EPA should increase accessibility and function of data and databases. For example, the EPA could make certain modeling data available and accessible to the public. The EPA could also consider whether certain databases have data that can be layered to provide greater accessibility to information in one location.

3.2. Expand Integration of Ambient Monitoring Data: The EPA should continue to pursue opportunities for expanding access to data from sensors and integrating it with other monitoring data in order to improve understanding and communication of real-time ambient air quality information (*i.e.*, AirNow Fire and Smoke map).

Tribal

"Mankind needs to move away from our learned habits and embrace new methodologies before we destroy our inheritance."

- Tribal Air Program Professional

Introduction

Air quality impacts the 9.7 million people who were identified in the 2020 census as American Indian and Alaska Native (AI/AN). Further, both rural and urban air quality issues impact Tribes: 78 percent of AI/AN live outside of Tribal reservations or lands, while the remaining 22 percent of AI/AN live on trust lands or reservations. The 2010 census also shows that 60 percent of AI/AN live within a metropolitan area.[126]

For thousands of years prior to the colonization of North America, indigenous peoples engaged in resource conservation including land management practices such as burning of grass-fuel dominated forests.[127] Post-colonization, American Indian and Alaska Native Tribes have gradually re-established their role in land and natural resource management.[128] In 1970, when Congress enacted the "modern" CAA, the federal government assumed a lead role for air pollution and associated public health impacts. Though Tribes were not initially recognized in the 1970 statute, the 1990 Amendments to the CAA enabled Tribes to assume authority for air quality management in Indian Country through the Tribal Authority Rule (TAR)[129] and Treatment-as-a-State (TAS). These authorities reflect the US Constitution, which recognizes Indian Tribes as distinct governments with many of the same powers as federal and state governments, such as the ability to regulate their internal affairs, to establish their own form of government, to enact legislation, and establish law enforcement and court systems.

The 1990 CAA Amendments also made Tribes eligible to receive federal funding for environmental programs,[130] and in the 30 years since, Tribal management and capacity have grown markedly. As of 2021, 85 Tribes operate air quality monitors, 74 Tribes have completed emissions inventories, 61 Tribes have non-regulatory TAS status, 10 Tribes have regulatory TAS status, and 127 Tribes are funded to manage air quality through either the CAA Section 103 or CAA Section 105 program. As of 2021, there are 15 Tribes that are implementing regulatory or permit programs in Indian country.[131] Seven of those Tribes are implementing TIPs, 2 of the Tribes are managing Title V programs, and 6 Tribes have delegation of the Federal Air Rules for Reservations, a Tribal program in EPA Region 10.

Challenges for Tribes include more than 400 major sources sited on Tribal lands, 113 Tribes experiencing non-attainment of one or more NAAQS, interstate and trans-boundary air pollution, and the many consequences of climate change. In the last decade, some of the worst wildfires in history took place, particularly in the western US, where all 215 Tribes experienced episodes of "thick density" smoke in the 2019-2020 fire season.[132] In Alaska, where over 40% of federally recognized Tribes reside, unprecedented wildfires and extreme drought conditions endanger the health and safety of many rural and remote Tribes.[133]

Carol A. Kriebs, Chairwoman of the National Tribal Air Association, noted in 2021 that Tribes have been practicing resiliency for thousands of years and will continue to persevere. She adds that with the EPA's support, Tribes are committed to protecting air quality for "their people, airsheds, and non-human relatives." The US government supported Tribal rights to protect these resources in Executive Order 13175, adopted on November 6, 2000, which states that "The US recognizes the right of Indian Tribes to self-government and supports Tribal sovereignty and self-determination." EO 13175 was reaffirmed by the Biden Administration in the January 26, 2021, Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships.[134]

Chairwoman Kriebs expresses concern and disappointment that federal funding for Tribal air programs has been stagnant or declining for nearly 20 years and that "there are many Tribes that wish to develop air quality programs to improve public health for their communities, but federal grants for new Tribal air programs are difficult to achieve due to the stagnant nature of federal CAA funding."[135]

Successes

Since its adoption in 1970, the CAA has measurably improved air quality, yielding important environmental and human health benefits for Tribes. Many Tribes have unique hurdles they must overcome to execute successful CAA programs, and those programs typically have direct positive impacts to EJ and both Native and Non-Native communities. Successes associated with the CAA include:

1. Emissions Reductions with Positive Impacts on Tribal Natural Resources and Health

1.1. SO_2 emissions have declined in part due to the use of marketable pollution allowances, which in turn cut power plant emissions that contributed to acid rain. Reducing acid rain has reduced the damage to water quality in lakes and streams and the subsequent harms to fish and wildlife. This protection of fish and wildlife is one way the CAA helps ensure sustainability of treaty-protected Tribal resources. Between the 1989 to 1991 and 2009 to 2011 observation periods, wet deposition of sulfate (which causes acidification) decreased by more than 55 percent on average across the eastern US.

1.2. Mercury poses a significant health risk for many Tribes. Methylmercury bioaccumulates in the tissues of finfish and shellfish. Exposure to mercury and its toxins, which exert neurological impacts on both humans and wildlife, can occur through consumption of contaminated fish and shellfish.[136] Because many Tribes have higher rates of fish and shellfish consumption than the non-Indian public, they may have a higher exposure to mercury (the EPA uses a mean per capita ingestion rate of 20.1 grams/day for the general population and with Tribal populations, recommends the use of the 99th percentile, or 215.7 grams per day.)[137] While there remain areas of high concentrations of mercury, the CAA has helped accelerate measurable improvements. This success is due in part to the 2011 EPA issuance of the MATS regulation, which helped reduce toxic air pollutants from coal- and oil-fired power plants. For example, CDC data from 1999-2010 in the National Health and Nutrition Examination Survey found a decline of 34% in blood mercury concentrations in women of childbearing age.

1.3. Reductions in criteria pollutants and HAPs have reduced Tribal exposures to carcinogenic and mutagenic chemicals detected in flora, fauna, fish, and wildlife,[138] which many Tribes rely on for their subsistence lifestyle, for cultural and spiritual purposes, and for the beneficial respiratory and cardiovascular health outcomes.

2. Expansion of Tribal Capacity in Air Quality Management

2.1. The number of Tribes with regulatory TAS status has grown from 7 Tribes in 2012 to 11 Tribes in 2020. Tribes with non-regulatory TAS has gone from 34 in 2012 to 60 in 2020. These increases reflect growth in Tribal air quality management, but also in Tribal sovereignty to regulate air quality in partnership with state and local governments. In addition, 7 Tribes have TIPs, 6 Tribes have Class I Redesignation under the PSD Program, and 2 Tribes Implement Title V Programs. To put this information into context, Tribes own nearly 100 million acres, which represents greater than five percent of the land in the US. 56 million of these acres are in the contiguous US, while another 44 million acres are owned by Alaska Natives.[139]

2.2. Tribal implementation of CAA programs has been strengthened through collaboration with Northern Arizona University, which established the Institute for Tribal Environmental Professionals (ITEP) in 1992. This was a result of the need for Tribal capacity building due to the CAA's implementation of the TAR and TAS. ITEP strengthens Tribal capacity and sovereignty in environmental and natural resource management through culturally relevant education, research, partnerships, and policy-based services. Ambient air quality programs provided by ITEP include training, web-based learning, student scholarships, the National Tribal Forum on Air Quality, and many other programs that build Tribal capacity.

2.3. In 2009, the EPA's Office of Air Quality Planning and Standards adopted the guidance document "Consulting with Indian Tribal Governments," and in doing so, provided a roadmap for the agency to address CAA issues with Tribes on a government-to-government basis.

2.4. In 2011, the EPA promulgated the Review of New Sources and Modifications in Indian Country and in 2014 revised this rule in the form of a FIP. This benefitted CAA permitting of air pollution sources in Indian country and helped improve implementation of the minor NSR rule. Before the implementation of the Tribal minor NSR, there was no way to permit minor sources in Indian Country, leaving a "hole" in permitting and enforcement.

2.5. The Tribal Air Monitoring Support (TAMS) Center was established in 1999 through a partnership between the EPA and ITEP. The TAMS Center is guided by a steering committee that includes Tribal participants from throughout the US. The technical training center has trained over 1,900 Tribal environmental professionals, representing 298 Tribes.

2.6. The TAR implements the provisions of section 301(d) of the CAA and authorizes eligible Tribes to implement their own Tribal air programs. The TAR was adopted in 1998 and represents the EPA's position that the CAA constitutes a "statutory grant of jurisdictional authority to Tribes" that is consistent with the language of the Act. The TAR enables Tribes to adopt a TIP.

2.7. Other successes include EPA delegations of the Title V Operating Permit Program, Tribal participation in Regional Planning Organizations to address visibility and haze, Tribal NSR, and establishment of a Tribal set-aside within DERA. These have enabled Tribes to fully participate in regulating sources that are located on, or impact, their lands. A great deal of training and capacity building has taken place for Tribal environmental staff as well as Tribal leadership and legal staff.

Opportunities and Future Challenges

There are a number of crucial areas where the EPA could improve upon its methods of addressing air quality in Indian Country.

1. Air Quality Management Resources

1.1. Insufficient and inconsistent funding for compliance and enforcement: Tribal air programs are an essential contributor to air quality regulation and management. Lack of adequate funding results in insufficient field staff for compliance monitoring and assurance as well as enforcement. This places the onus for inspections or permitting site visits on the EPA, yet their regional offices in urban areas are far from the 56.2 million acres[140] of frequently rural reservations. Travel budgets for regional EPA air program staff are historically limited, adding another barrier to their role in on-site air quality enforcement.

1.2. Stagnant funding for Tribal air programs: The US General Accounting Office examined environmental funding to Tribes for FY 2014-2019 and concluded that "More Tribes are applying for a stagnant or declining pool of funds – leaving each Tribe with less."[141] Because federal CAA funding has been stagnant, Tribes with existing air quality management programs receive the vast majority of available funds. Consequently, hundreds of Tribes have a difficult time obtaining air program funding, even though they may experience non-attainment or have unclassifiable airsheds. Tribes who do have CAA funding have faced flat funding for many years, limiting their capacity to update their emissions inventories, to purchase new monitors, to develop new quality assurance project plans, or to pursue authorities such as Class I Redesignation, permitting authorities, TIP development, or TAS status.

2. Climate Change

2.1. The impacts of wildland fires and intrastate, interstate, and international air pollution transport on the attainment status of Tribal lands are expected to increase in importance. As a result, there is a risk of air quality designations migrating from "attainment" to "non-attainment" due to pollution beyond Tribal control. Because being classified as "non-attainment" will negatively impact Tribal economic development, these events require some relief under the CAA.

2.2. Exceptional events will become more difficult to address as these events continue to impact air quality designations. Tribes may need supplemental human resources to participate in any revisions to the designations, as well as the forestry and land management policies that contribute to exceptional events, at the local, state, and regional level.

2.3. Ambient and indoor air quality may be impacted by increases in smoke, mold spores, pollens, and other pollutants and allergens. Because Tribal housing often lacks whole-house ventilation or HVAC systems, ventilating and filtering the indoor air is a particular challenge for many Tribal households. The EPA can provide value by identifying effective and safe technologies for filtering indoor air and by promoting indoor air filtration in grants and cooperative agreements with Tribes.

3. Government to Government Consultation

3.1. EPA interactions with Tribes are guided by policies, such as the 1984 Indian Policy and the EPA Policy and Federal Policy on Consultation and Coordination.[142] Yet while the agency's actions often reflect these policies, it is not always consistent. President Obama's 2009 Executive Order on Tribal Consultation notes that failure on the part of the federal government to "include the voices of Tribal officials in formulating policy affecting their communities has all too often led to undesirable and, at times, devastating and tragic results."[143]

3.2. Engaging with the National Tribal Air Association is useful but is not direct consultation. Current federal policy is to recognize this sovereignty and to operate on a government-to-government basis with Tribes.[144]

3.3. Streamlining of processes, particularly opportunities for comment, challenges Tribes' ability to investigate and provide thorough comments.

4. Air Quality Monitoring Infrastructure

4.1. Aging monitors: The National Tribal Air Association's 2021 Status of Tribal Air Report estimated that half of all air monitors in Indian Country are over ten years old, which means they are approaching the end of their useful life. Financial support is necessary for Tribes to upgrade or expand their air quality monitoring networks. It is noteworthy and disappointing that in 2021, 85 Tribes were operating air monitors, a reduction from 88 in 2020.

4.2. Low-cost sensors: With low-cost monitoring technologies proliferating rapidly (see "Developing and Utilizing High Quality Data" section), Tribes can now affordably expand the number and locations of sites for data collection. However, while "citizen science" is valuable, it is not a substitute for regulatory monitoring, and the EPA and Tribes cannot rely solely on citizen science to make formal regulatory decisions in Tribal areas or provide legally defensible data.

Recommendations

The following recommendations reflect information that the CAAAC heard from individual Tribal air programs in the process of preparing this report, as well as needs identified by the National Tribal Air Association.

1. Tribal Capacity

1.1. Invest in Tribal Air Quality Management capacity through adequate and consistent funding.

1.2. Provide timely approval of applications for TAS from Tribes.

1.3. Provide resources for additional Tribes to have their own air quality management programs.

1.4. Encourage Tribes to apply for Tribal authorities, including Class I redesignation.

1.5. Avoid directing Tribes towards "informational monitoring" with low-cost sensors, versus investing in Tribal use of Federal Reference Methods. Tribes should have the prerogative to decide the level of monitoring and data collection in their jurisdictions. This should be observed at both the national and regional level.

1.6. Invest in Tribal regulatory monitoring equipment so that Tribes operate as partners with local, regional, and state air quality agencies.

1.7. Continue to strengthen Tribal ability to set air quality standards for Indian Country, as authorized by the TAR.[145] This includes requiring upwind state and federal land/air/water managers to consult with Tribes on activities that could exceed standards set by the Tribe or have impacts wherein thresholds have not been set but strong indications of potential harm exist.

1.8. Provide new funding to Tribes to keep pace with the increased amount of work in permitting new stationary sources and to review permits issued by states and the EPA.

1.9. Assist Tribes with wildland fire response – monitoring impacts from controlled burns, which are increasingly necessary for decreasing the impact of large fires.

2. Improve Government-to-Government Consultation with Tribes

2.1. The EPA should work to ensure meaningful Government-to-Government Consultation, especially when considering delegating authority to states.

2.2. Tribes are sovereigns and should be provided opportunities for direct consultation with the EPA, rather than the EPA relying only on consultation with the National Tribal Air Association.

2.3. Develop and implement training of new and existing EPA Air staff on the 1984 Indian Policy, the Government-to-Government relationship, and the intent and procedures of Tribal consultation.

3. Special Consideration of Tribal Concerns and Recommendations

3.1. Given their status as sovereign entities, the EPA should give special consideration to Tribal concerns and policy recommendations on implementation of the CAA. Tribal governments that provided input to this report made broader recommendations on implementation of the CAA. These included support for measures to control GHGs, reconsideration of the 2020 PM and O_3 NAAQS reviews, review of the cost/benefit and transparency in science rules promulgated in recent years, building the agency's EJ program, and reducing emissions from oil and gas. Many CAAAC members support some or all of these recommendations, while others may not support any of them. Regardless of our own views on these issues, we recognize:

3.1.1. The special consideration that the EPA and other stakeholders owe to Tribal perspectives on overall national air quality policies

3.1.2. The treaties entered into by the US that require the US to provide for Tribal communities and native peoples

3.1.3. That Tribes across Alaska and the lower 48 states are experiencing acute disruption to their treaty-protected resources as a result of climate change

3.1.4. That the Tribes concur with the 2021 report issued by the United Nations Intergovernmental Panel on Climate change, which declared a *code red* for the planet and noted its impact on Tribal and indigenous peoples.

4. Other

4.1. Continue to support diesel emissions reduction grants to Tribes and in support of improvement of air quality in Tribal areas, such as the successful Tribal set-aside in the DERA program.

4.2. If a Wood Heat Emissions Reduction Act (WHERA) is approved by Congress, the agency should establish a Tribal set-aside in the WHERA program as well, considering the extensive use of wood heat throughout Tribal lands. The EPA should also reduce or eliminate any Tribal match requirements, as they have done with the DERA grant.

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Environmental Justice

Introduction

This 50th Anniversary report was commissioned to be both retrospective and prospective, highlighting successes and future challenges of the CAA. It thus provides an inflection point for all that the EPA has accomplished. Yet in celebrating the 50th anniversary of the CAA, it is incumbent that we acknowledge the differential impacts of air quality on communities across the US.

The purpose of this section is to explicitly acknowledge these disparities, while also highlighting the CAA's successes and opportunities for bringing about EJ. The EPA defines EJ as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." The EJ movement arose from disparities in environmental quality among communities of color and low-income communities, with air pollution just one of several pathways of exposures.

An extensive body of scientific literature establishes that black, brown, and indigenous communities in the US continue to experience some of the worst air quality in the nation, demonstrated across multiple scales and metrics.[146] Disparate exposure to air pollution also varies across income groups, with a higher risk of premature death from fine particle air pollution among low-income communities.[147]

Higher rates of morbidity and mortality within EJ communities are associated with well-documented disparities in air pollution exposures. In their 2020 Review of the NAAQS for PM, the EPA itself references the Integrated Science Assessment data, noting: "[t]here is strong evidence demonstrating that black and Hispanic populations, in particular, have higher $PM_{2.5}$ exposures than non-Hispanic white populations," and that "there is consistent evidence across multiple studies demonstrating an increase in risk for nonwhite populations."[148] These disparities, by income, race, and ethnicity, were recognized early on by Dr. Robert Bullard, long considered the father of the EJ movement. Dr. Bullard observed that, "Whether by conscious design or institutional neglect, communities of color in urban ghettos, in rural 'poverty pockets,' or on economically impoverished Native-American reservations face some of the worst environmental devastation in the nation."[149]

Air pollution, however, is a particularly persistent risk factor in EJ communities. Despite clear and substantial improvements in air quality over the last five decades, the benefits have not accrued equally to all. For example, a 2020 report by Colmer et al. found that concentrations of $PM_{2.5}$ vary spatially. Reviewing 36 years of data, across 8.6 million grid cells with geographic, economic, and demographic data from ~65,000 US census tracts, the researchers illustrated that "differences in $PM_{2.5}$ between more and less polluted areas declined substantially between 1981 and 2016. However, the most polluted census tracts in 1981 remained the most polluted in 2016. The least polluted census tracts in 1981 remained the least polluted in 2016. The most exposed subpopulations in 1981 remained the most exposed in 2016."[150]

The CAA provides a framework for addressing these disparities. The CAA requires the EPA to consider the health impacts of air quality on subpopulations, making it one of the most important pieces of public health legislation in US history. In addition, the CAA establishes primary NAAQS, which go beyond protecting the general population and are intended to protect the health of the public, including sensitive populations. They do this by establishing maximum allowable air pollution concentrations that apply nationally, regardless of regional variations in air pollution concentrations. By establishing these limits, the NAAQS have reduced air pollution-related mortality among communities of color. Recent integration of satellite imagery, air quality monitors, and chemical air transport models have demonstrated promising results. Currie et al., 2020, utilized this approach and found that the CAA has been the single largest contributor to reduction of racial disparities in $PM_{2.5}$ exposure.[151]

From an EJ perspective, NAAQS are also instrumental when areas are designated "nonattainment." The nonattainment designation is based on measured air quality within a designated area, in comparison to the design value of the NAAQS. Where multiple monitors are placed within an area consistent with EPA regulations, all monitors generally "count" towards attainment status so that the "worst performing" monitor can serve to establish the attainment status of the area. The required placement of monitors varies according to the individual NAAQS, but in general, they are expected to measure area-wide conditions.

The CAA regulations also direct regulators to address "hot spots" for certain pollutants in places where localized emissions may be expected, such as those that occur in the context of transportation projects. These air quality hot spots are partly the product of redlining, a common real estate practice which began in the 1930s that produced a legacy in which communities of color are substantially more likely to live within or adjacent to the most heavily polluted airsheds.[152] In some parts of the US, a significant proportion of black households live within 30 miles of a coal-fired power plant, while the proportion of people of color who live in "fence-line" communities is up to 75% greater than the general population in the US.

The recommendations in this section should be viewed as a platform for dialogue between the EPA and its EJ stakeholders, not a comprehensive accounting of the complex, diverse, and localized nature of air quality issues impacting communities of color.

Successes

Because the CAA establishes a national standard for clean air that applies uniformly, it has been characterized as "establish[ing] clean air as a right of all people of the US."[153] Between 1970 and 2017, the aggregate national emissions of the six criteria pollutants were reduced by an average of 73 percent and in the period from 1990 to 2017, concentrations of air pollutants improved "80% for lead, 77% for CO, 88 percent for SO_2 (1-hour), 56 percent for NO_2 (annual), and 22 percent for ozone." While these reductions are national averages, the substantial improvements in air quality have reduced health hazards in many EJ communities.

Mean ambient concentrations of lead have continuously and measurably declined since the inception of the CAA, accelerated by the EPA's phasing out of lead in gasoline, reducing risks to EJ communities. And while lead exposure in EJ communities commonly occurs through lead-based paint and pipes, industrial emissions of lead add another pathway of exposure, through inhalation of airborne and depositional lead.[154] Reductions in lead emissions help reduce neurological damage to children and cardiovascular impacts on adults, particularly as there is a linear correlation between levels of lead in the air and in human blood.[155]

Mercury emissions declined by nearly 80 percent between 1990 and 2014, due in large part to EPA regulation of major mercury sources, including municipal waste combustion and medical waste incineration. Mercury deposition from atmospheric emissions is a well-established route to contamination of fish and shellfish, where toxic methylmercury bioaccumulates.[156] This illustrates how the NAAQS primary standards protect public health directly, but are accelerated when the NAAQS secondary standards, through protection of ecosystems, also result in public health benefits. In the case of mercury, contaminated fish and shellfish impact American Indian/Alaska Native populations, certain Asian populations, and some black communities in the Southeast, who can have high dietary exposure to mercury as they are among those with higher fish and shellfish consumption rates than the general population. (The EPA uses a mean per capita ingestion rate of 20.1 grams/day for the general population, and with Tribal populations, recommends the use of the 99th percentile, or 215.7 grams per day.)[157] Through the CAA, reductions achieved in atmospheric emissions since 1990 are associated with reductions in fish methylmercury concentrations. This measurable reduction was noted by the CDC, who observed a 34% decline in blood mercury concentrations in women of childbearing age, from 1999-2010.[158]

American/Indian, Alaska Natives, and African Americans have the highest rates of asthma prevalence in the United States. Pollutant reductions accomplished through the CAA directly aid in reducing these asthma disparities. Due to the CAA, ***stationary sources, often within EJ communities, emit about 1.5 million tons fewer air toxics than was the case in 1990*** (EPA Air Toxics Program). An additional 1.5 million tons of HAPs were reduced from mobile sources. This reduction is an important success, as many EJ communities live closer to public transit and major roadways, and traffic-related air pollution is positively associated with asthma.

159, 160

SO_2 has dropped in part due to the use of marketable pollution allowances, which in turn cut power plant emissions that contribute to acid rain. Reducing acid rain has minimized the damage to water quality in lakes and streams and the subsequent harms to fish and wildlife. According to the EPA's *Progress Cleaning the Air and Improving People's Health* webpage, between the 1989-1991 and 2009-2011 observation periods, wet deposition of sulfate (which causes acidification) decreased by more than 55 percent on average across the eastern US.[161]

Pioneering research and development of modelling tools has provided new methods for assessing cumulative risks to vulnerable communities. The development of EJSCREEN, the EPA's EJ mapping and screening tool, is a notable success. EJSCREEN consists of 11 environmental indicators and six demographic indicators, reported at the census block level. This integration of data layers enables air quality agencies to assess cumulative and/or disproportionate impacts during their permitting process and guide decisions on monitor placement.

Improvements in air emissions inventories and modeling techniques have enabled the EPA to examine a wider range of air toxics and to calculate potential lifetime cancer risks associated with the pollutants. One example is NATA, which has provided multiple indicators that are used in EJSCREEN. While NATA can help EJ communities explore air toxics risks, there are limitations, including that NATA is best applied broadly, at the county, state, or national level to determine absolute risk levels, but it can also be used to identify relative risks by census tract within counties.

The citizen suit and judicial review provisions of the CAA provide legal mechanisms for addressing issues in EJ communities. Two sections of the CAA authorize citizen participation in CAA enforcement and the implementation of CAA provisions. Section 304 of the CAA allows for citizen suits against CAA violators or against the EPA, where there is a failure to perform any act or duty. This provision has been successfully used to address compliance issues in EJ communities. Section 307, meanwhile, allows for judicial review of EPA regulations and final actions taken under the authority of the CAA. These provisions are particularly meaningful when EJ communities have access to compliance information. The EPA has established several online tools that provide key air quality data, including the "Enforcement and Compliance History Online," which enables users to search facilities in their community and assess their compliance with environmental regulations. Similarly, the EPA's Toxic Release Inventory program enables EJ communities to track chemical releases in their neighborhoods.

President George H. W. Bush established the Office of Environmental Justice (OEJ) in 1992 through an Executive Order. OEJ works collaboratively with EJ communities, providing direct support (financial resources, technical assistance) as well as partnerships with organizations such as NEJAC. NEJAC, along with staff in OEJ, is part of the effort to build additional capacity among EJ communities, which contributes to racial equity through improvements in implementation and enforcement of the CAA.

Opportunities and Future Challenges

1. The EPA has the opportunity to address EJ hotspots and concerns through enhanced monitoring and modeling, using technologies and methods that improve characterization of exposure. New data techniques, such as dispersion modeling, enable researchers to understand emission sources and exposure patterns at finer spatial resolutions. This type of data will help inform both CAA regulatory and non-regulatory actions, as well as provide a stronger scientific basis for agency planning and decision-making. Higher-resolution photochemical modeling for O_3 and $PM_{2.5}$ would also be helpful. For example, the EPA often provides 12 km x 12 km modeling nationwide, but within communities, 4 km x 4 km or 1 km x 1 km modeling would really be needed to assess disproportionate impacts on EJ communities/neighborhoods.

2. The application and rapid expansion of alternative monitoring technologies, such as low-cost sensors, provides the EPA with an additional opportunity to understand local air quality conditions. Though sensor performance and accuracy are still evolving, and issues must be resolved with respect to some programs, such as the NAAQS, sensor data will increasingly enable the EPA to assess exposure patterns at a far more localized scale. Sensor data, strategically collected in EJ hotspots, can help evaluate changes in exposure to criteria and other air pollutants. Sensor data may also help the agency with future federal reference methods (FRM) monitor siting and can also be used for non-regulatory purposes, as example, for public health risk communication.
3. High quality data, such as that collected from FRM and federal equivalent methods monitors, will become even more critical for issuing accurate and timely public health advisories. EJ communities may experience heightened risk during air quality events due to a combination of land-use patterns, socioeconomics, underlying health conditions, and demographics. Exposures can be mitigated at least partially through effective risk communication about air quality conditions. Monitoring data of poor inherent quality can lead to inaccurate or delayed information to public health authorities and in turn, to the public.
4. The NAAQS are effective in protecting public health, by establishing maximum allowable pollutant levels for individual pollutants. However, the statutory pollutant-by-pollutant approach of some CAA programs does not always adequately address the situations in which a community may be exposed to elevated levels of multiple pollutants.

Recommendations

1. The EPA Should Incorporate EJ More Extensively and Transparently into Key Risk Assessment Analyses.

Broadly, the EPA should be incorporating EJ considerations into the design and reporting of all of its key air quality risk assessments, based on our knowledge that failing to do results in mischaracterization of risk of both EJ communities and non-EJ communities. Specifically:

1.1. The EPA should strengthen its understanding of multi-pollutant exposures and apply a multi-pollutant approach to understanding and reducing risks from air pollution. The agency can draw from its collaboration with exposure scientists and epidemiologists to improve characterization of health risks where multiple emission sources have been documented, focusing on vulnerable populations. This information can be used by the agency to identify variations in EJ community exposures and leverage multipollutant authorities under the CAA.

1.2. The EPA should make it a priority to improve emissions inventories for sources that would significantly impact EJ risk characterization. When the EPA conducts reviews of emissions inventories for completeness, accuracy, and representativeness, it should include a special sub-analysis for EJ communities and ensure that adequate attention and resources are allocated to improving inventories that would be most likely to influence risk characterization in EJ communities.

1.3. Incorporate EJ-specific risk assessment and analysis into the NATA. Data from NATA is integral to risk assessments in EJ communities and to conducting multi-pollutant exposure assessments. In addition to the overall recommendations related to the NATA in the "Air Toxics" section of this report, the CAAAC also recommends that the EPA incorporate EJ screen into the report and include special analysis and summaries of risk for EJ communities. For example, the term "environmental justice" doesn't appear in either the results summary or the technical support document for the 2014 NATA, making it harder to understand the special burdens EJ communities may face in exposure to air toxics.

1.4. Continue to incorporate EJ considerations into NAAQS reviews. When conducting NAAQS reviews, the EPA should ensure that it includes analyses on the extent to which exposures vary by race, ethnicity, and income and should include more neighborhood-scale analyses in order to ensure consideration of these factors in setting appropriate NAAQS. A good example of where race/ethnicity and income-level analysis were explicitly incorporated into a NAAQS review was the 2020 PM NAAQS review, which did show differential exposures by race and income.

1.5. The EPA should support methods for mapping community vulnerability to climate-related air quality events. Disproportionate impacts of climate change based on race and class are outlined in the scientific literature on climate change, but the EPA can inform agency policy by accelerating the use of this data through its spatial screening tools and is uniquely suited to carry out or guide these types of analyses in the future. The EPA can and should also account for how phenomena like the urban heat island effect and heat waves can exacerbate the effects of exposure to air pollution for EJ communities.

1.6. The EPA should use EJSCREEN and other analytical tools to incorporate EJ considerations into other agency air quality analyses, to the extent possible. The agency should use data and data integration tools, such as NATA and EJSCREEN, to strategically identify areas for additional monitoring, analysis, and outreach. EJSCREEN data should also be used to help inform how the EPA develops CAA regulations, programs, and activities and imposes other requirements, such as SIPs. Strengthening modeling technologies and mapping tools will further the agencies' capacity to support EJ communities, in what Dr. Charles Lee, principal author of the landmark report Toxic Wastes and Race in the US, describes as a decades long journey "from describing to quantifying to mapping disproportionate impacts."

1.7. If an EJ analysis were to replace NATA, potentially via EJSCREEN, the level of detail and supporting analysis that NATA provides should be integrated into the tool in a way that is accessible and useful to the EPA's state and local co-regulators.

2. The EPA Should Expand and Enhance Air Pollution Monitoring in EJ communities.

Despite decades of meaningful investment in a national monitoring network, there are still gaps in EPA monitoring data in EJ communities. Meeting current requirements for state/local/Tribal monitoring networks does are not necessarily provide adequate information on how pollution levels vary between EJ and non-EJ communities. Network expansion is also necessary to provide data for exposure modeling, for analysis of cumulative effects, and to characterize impacts among people living in close proximity to stationary sources. For example, in 2008, the Minnesota Pollution Control Agency adopted the Minnesota Cumulative Air Permitting Protocol, establishing a requirement to analyze and consider "cumulative levels and effects of past and current environmental pollution from all sources on the environment and residents of the geographic area within which the facility's emissions are likely to be deposited."

2.1. The EPA should conduct an analysis of the current regulatory monitoring network to adequately characterize air pollution exposure in EJ communities. While low-cost sensors are a great way to enhance the general understanding of air pollution in an area, they are not a substitute for regulatory monitors, and the lack of regulatory monitors in an EJ community could lead to any non-regulatory data collected within these communities to be not taken as seriously as the situation might warrant. In light of this, the EPA should conduct a nationwide review of the adequacy of the current network to characterize the number and type of monitoring stations placed directly within EJ communities and known hot-spots and periodically update this analysis once every five years.

2.2. The EPA should explicitly account for EJ considerations in approval of monitoring network plans and reviews. The EPA has the authority to set standards for the approval of state/local/Tribal monitoring network plans and should consider using this authority to ensure that adequate resources are being allocated to monitor air pollution in EJ communities. For example, the EPA could consider 40 CFR §58.10 as a potential area for revisions to address these issues.

3. The EPA Should Work to Expand the Capacity of EJ Organizations.

It is important to ensure that the communities themselves have the ability to work on air quality issues and remain engaged in their communities. This will help ensure more durable engagement from EJ communities in all aspects in the implementation of the CAA.

3.1. The EPA should increase CAA funding for community-based programs through grants and cooperative agreements. This will help build capacity to engage as stakeholders in air quality regulation, monitoring, and policy, as well as to advise on air quality matters that they have prioritized.

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160 Bowatte, G., Lodge, C., Lowe, A. J., Erbas, B., Perret, J., Abramson, M. J., Matheson, M., & Dharmage, S. C. (2015). The influence of childhood traffic-related air pollution exposure on asthma, allergy, and sensitization: A systematic review, and a meta-analysis of birth cohort studies. *Allergy*, *70*(3), 245–256. https://doi.org/10.1111/all.12561

161 EPA. *Progress Cleaning Air and Improving Peoples' Health*. https://www.epa.gov/clean-air-act-overview/progress-cleaning-air-and-improving-peoples-health. Accessed 7/14/2021.

GHG Emissions and Climate Change

Introduction

As might be expected, views among CAAAC members concerning past utilization of the CAA to address GHG emissions and climate change – and what actions may be available and/or necessary in the future – differed in substance, form, and direction. Some members view climate change as an existential challenge requiring the EPA to use the CAA to focus on major emitters across all stationary and mobile sectors. Other views, not necessarily in conflict, focused on securing broad international action on climate change relying on provisions of the Act not previously utilized to control GHGs. Some members emphasized the role of states and localities to address climate issues and urged broader cooperation with the EPA. Other opinions centered on the need for clear accounting rules and reliable data to both allow for proper assessment of emissions and to allow for determination of the GHG impact of domestic and international products. Still other opinions recommended that the EPA use the CAA to approach GHGs as a "co-pollutant" largely occurring as a by-product of combustion.

While this report focuses on the 50-year history of the "modern" CAA and the remaining challenges and opportunities that lie ahead, it must first be observed that efforts to utilize the Act to address GHGs are still very much a work in progress. Within the full history of the CAA, using the legal authority of the Act to directly control GHGs is of relatively recent vintage, with most activity occurring following the 2007 seminal Supreme Court decision in *Massachusetts v. EPA*. And, as outlined below, these efforts have been met with varying levels of success and, in some cases, have engendered years of litigation.

The most recent estimate of US GHG emissions showed that total gross emissions in 2019 were approximately 2% above 1990 levels.[162] Domestic GHG emissions declined 1.7% in 2019 and could also be expected to be significantly lower in 2020 due to the broad impacts of COVID on economic activity.[163] But, when viewed over a longer timeframe, the two-decade trend of US GHG emissions is fairly stable, meaning that while overall carbon intensity and more efficient production/use of GHGs has steadily improved, these actions have not been sufficient to substantially offset additional transportation, electric generating, industrial, and other source emissions.

This is not to discount the progress that has been made, particularly in recent years. Between 2018 and 2019, total reported GHGs from large facilities in the US declined by 5% and powerplant GHG emissions by 25% between 2011 and 2019.[164] But GHG emissions in 2021 and 2022 may reasonably be predicted to increase as travel, energy demand, and industrial production recover from the global economic disruption experienced for much of 2020. Thus, whether the downward trend in total GHG emissions over the last decade can be sustained or supplemented remains to be seen.

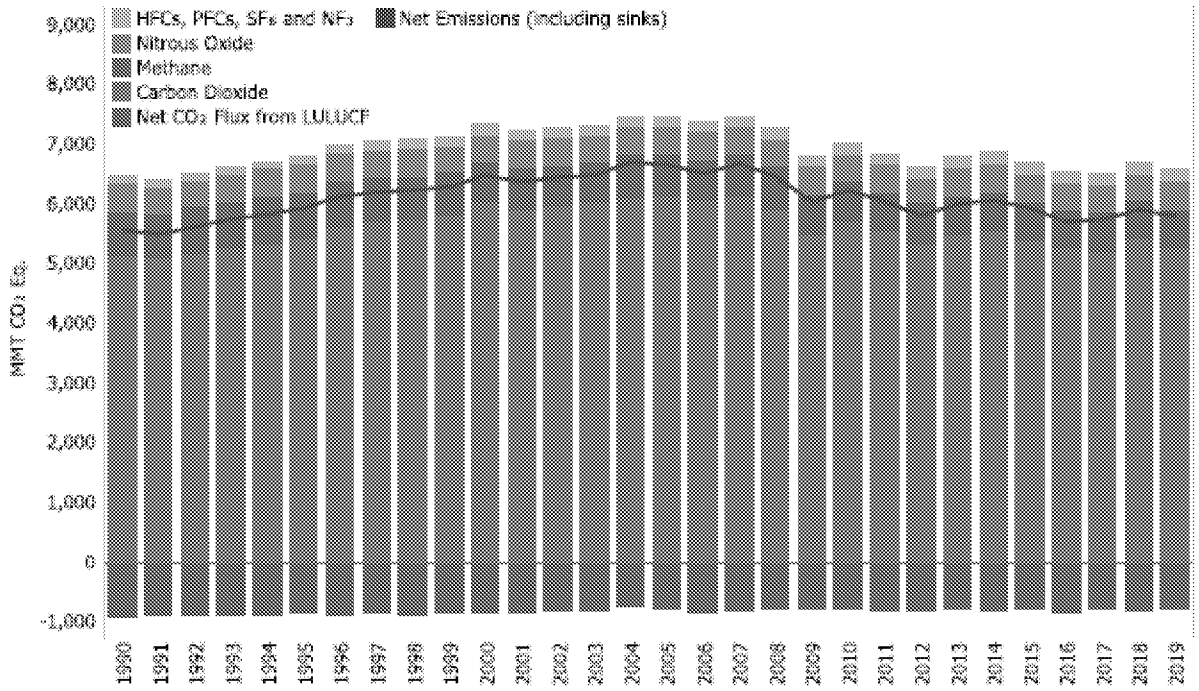


Figure 5. US GHG Emissions by Gas

Opinions differ with respect to how the US should address GHG emissions, in what timeframe and how aggressively. This report does not attempt to resolve all of the broader issues concerning GHGs and climate change, nor address the full range of governmental, private sector, and personal actions that may be necessary to meet either domestic or international targets for reducing emissions and/or achieving longer-term goals. This report, however, does address a key part of US climate change policy: implementation of the CAA. Absent more comprehensive legislative authority – such as economy-wide "cap and trade" measures, federal clean energy standards, taxation of carbon/GHG emissions, or additional state and regional regulatory efforts – the CAA remains a central, if not the most important, existing statutory tool to reduce GHG emissions in the US.

The CAA assumes this importance given the breadth of potential authority to control air pollution from stationary and mobile sources and, directly or indirectly, consumer products. Certain regulatory actions may also affect the pricing and availability of higher GHG content/emissive products and services. And at least in some significant respects, CAA authority regarding GHGs may not be viewed by some as imposing sufficient requirements to address the issue adequately. Various provisions of the CAA require the Administrator of the EPA in his or her expert judgment to consider and weigh specific statutory factors in promulgating new standards. In addition, certain provisions of the Act treat new facilities and new products differently than existing facilities and products. And CAA regulations are also focused on various regulated entities as defined by the Act, not the utilization of energy or the emission of GHGs in the US economy as a whole.

In addition, with respect to certain authorities, the ability to implement emission reductions is premised on federal, state, and local co-operative efforts. As reflected in the Permits section of this report, many CAA source-level controls are determined through case-by-case determinations, largely implemented at the state level, or by the use of other authority wherein states are charged with determining the specific level of control.[165] Rather than a uniform "one size fits all" regulatory construction, in multiple respects the CAA requires that emission reductions be tailored to account for local circumstances.

But absent additional congressional action to address climate change, the CAA must still be viewed as the existing measure that Congress has directed to be utilized to control the major sources of GHGs in this country.[166] When the "modern" CAA was passed in 1970, GHG emissions were not specifically identified as a focal point, albeit "climate," and "weather" were included within the definition of adverse welfare effect. The major rewrite of the CAA that occurred in 1990 also did not focus on climate. The 1990 CAA Amendments primarily addressed requirements for the more traditional (criteria) pollutants and provisions to assure their attainment, new authority for the EPA to address air toxics, a new title to address acid rain, requirements for operating permits and authority to implement the Montreal Protocol and phase out ozone depleting substances.[167] In the three decades since the last comprehensive amendments to the CAA, however, the impact of GHG emissions has become better understood. Congress also sought to develop additional information on GHG emissions by directing the EPA to promulgate a GHG monitoring rule utilizing existing authority contained in the CAA and providing appropriate funds for this effort.[168]

And, as outlined below, the CAA has been successfully used for the last decade to control GHG emissions from nearly all onroad mobile sources (and, subject to ongoing litigation) fossil fuel-fired powerplants, the two major sources of GHGs in the US. Additional actions have been taken under the CAA to address high global warming potential substances, including refrigerants used in mobile and stationary applications. And the EPA has implemented specific authority contained in the CAA concerning the renewable content of transportation fuel. These initiatives have not been taken without at least some degree of controversy and in many cases, lengthy litigation.

Successes

Section 812 of the CAA Amendments of 1990[169] required the EPA to address the effect of the Act on the "public health, economy, and environment of the US," and to issue a report to Congress considering certain factors. In 1997, the EPA published a retrospective analysis of the CAA addressing the benefits and costs of the Act from 1970 to 1990. This study estimated total monetized benefits from 1970 to 1990 in the range of $5.6 to $49.4 trillion, with a central estimate of $22.2 trillion. Estimated compliance costs were $0.5 trillion.[170] A large percentage of benefits were attributed to avoidance of mortalities from PM and lead emissions.[171] The EPA subsequently updated this analysis to cover the period 1990 to 2020.[172] While this report necessarily incorporated certain assumptions concerning future implementation of the CAA, substantial net benefits were also forecast.[173]

A comprehensive analysis of costs and benefits of regulating GHG emissions under the CAA – at least to the knowledge of the CAAAC – does not exist.[174] Thus, any itemization of the "successes" of the CAA with regard to GHG emissions will necessarily include several qualitative as well as quantitative judgments.[175] GHG reductions, in terms of gross and net emissions, can and have been quantified with respect to individual rulemakings. But, in some cases, resulting benefits may not solely be attributable to CAA emission standards, such as with the sizeable migration of electric power generation from coal-fired to natural-gas and wind generation over the last six years.[176] And in other cases, the extent of net economic benefits has been dependent on several factors, including the relative "discount" rate to apply to GHG reductions.[177]

This report is not designed to address the larger debate over the desirable past or future extent of GHG emission reductions or to the extent such actions are necessary or cost-effective. From many perspectives, GHG emissions and climate change represent an existential threat. The most recent synthesis report of the Intergovernmental Panel on Climate Change confirmed that "human influence on the climate system is clear and growing, with impacts observed across all continents and oceans . . . stabilizing temperature increase to below 2°C relative to pre-industrial levels will require an urgent and fundamental departure from business as usual."[178] The Fourth National Climate Assessment indicated that "[c]limate change creates new risks and exacerbates existing vulnerabilities in communities across the US, presenting growing challenges to human health and safety, quality of life, and the rate of economic growth."[179] The report also emphasized that "[w]ithout substantial and sustained global mitigation and regional adaption efforts, climate change is expected to cause growing losses to American infrastructure and property and impede the rate of economic growth over this century."[180]

Rather, the report first focuses on the history of regulating GHGs under the authority of the CAA and rules that have been promulgated to date. The opportunities for future reductions are thereafter analyzed, along with the future challenges of utilizing the CAA to enable such reductions.

CAA Actions Addressing GHG Emissions (1990-present)

Following enactment of the 1990 CAA Amendments, the EPA required that certain sources monitor CO_2 emissions in accordance with section 821 of the Amendments.[181] The EPA also published the global warming potential of Class I and Class II substances in accordance with CAA §602(e) and considered such in taking certain actions to approve new substitutes under CAA §612. But because the CAA did not explicitly call for the direct regulation of GHGs under any specific provision of the Act, questions arose with respect to the EPA's legal authority to regulate GHGs and, if legal authority existed, whether the Agency was required by any provision to regulate GHGs. These issues sparked differing opinions as to how the CAA could be interpreted.

In 1998, EPA General Counsel Jonathan Z. Cannon drafted a memorandum concerning "[The] EPA's Authority to Regulate Pollutants Emitted by Electric Power Generation Sources." This memorandum, drafted in response to a congressional hearing, discussed the CAA's definition of an "air pollutant," and concluded that specific provisions of the CAA could allow for regulation of CO_2 if the EPA Administrator "determined under one or more of those provisions that CO_2 emissions are reasonably anticipated to cause or contribute to adverse effects on public health, welfare, or the environment."[182] The memorandum also indicated that the ability to take certain actions, which might include a "cap-and-trade program depended on the actions or the inactions of the states."[183]

In 2003, EPA General Counsel Robert E. Fabricant expressed a different view of EPA authority on the basis of a petition filed with the Agency by the International Center for Technology Assessment.[184] This memorandum expressed the view that the "CAA does not authorize the EPA to regulate for global climate change purposes." This opinion was based on the existence of several limited provisions in the CAA that address CO_2 and that the Act was not "specifically tailored" for certain global atmospheric issues, not including climate change. In 2007, fundamental issues concerning EPA authority to address GHGs under the CAA were "settled" by the Supreme Court. In *Massachusetts v. EPA*, 127 S.Ct. 1438 (2007), the court held, in part that GHGs unambiguously fit into the CAA's "sweeping definition" of an "air pollutant."[185] The court also determined that the EPA had statutory authority to regulate emissions of GHGs from motor vehicles and, further, that any decision by the EPA to determine whether GHGs endanger public health or welfare must be grounded in the statute.[186]

While the EPA had previously encouraged reductions in GHGs through voluntary programs (such as the EnergyStar program for labeling energy efficient products or the SmartWay program for encouraging the use of lower-emission trucks and transport vehicles), *Massachusetts v. EPA* effectively shifted the debate over use of the CAA to address GHGs. Indeed, while multiple EPA public/private partnership programs still exist,[187] the EPA responded to the decision with a series of actions that have continued until the present, with the most recent CAA GHG rule published in the Federal Register in January 2021.

In approximate chronological order, the EPA has taken the following actions:

- *2008 Advance Notice of Proposed Rulemaking* (ANPRM), 73 Fed. Reg. 44,354 (July 30, 2008). This lengthy notice was the result of internal analysis by the EPA regarding potential parts of the CAA that could be utilized to control GHGs. The 2008 ANPRM surveyed both available statutory authority, possible approaches to the use of that authority, and possible limitations. Specifically, the EPA reviewed the potential to use the following authorities to determine if they could be applied to GHGs:
    - NSPS for new, modified, and existing stationary sources, including the potential availability of "flexible" approaches to regulation.
    - Related requirements to address necessary "endangerment," and "cause and contribute" determinations with regard to CAA §111.
    - Title II mobile source provisions, including provisions for onroad engines and vehicles, nonroad vehicles and engines (including ocean-going vessels, locomotives, construction equipment, farm tractors, forklifts, harbor crafts and lawn and garden equipment), aircraft engine standards, fuels, and fuel additives.
    - NAAQS, through listing GHGs pursuant to CAA §108 and promulgating standards pursuant to CAA §109 and related provisions for the designation of areas under CAA §107 and requirements related to state and FIPs (CAA §§110, 179).
    - CAA §112 requiring listing of HAPs, MACT standards, and resulting RTRs.
    - CAA §115 related to SIP obligations to address international transport of air pollutants.
    - CAA §129 solid waste combustion standards.

- Implications of regulating GHGs under the CAA with regard to prevention of significant deterioration and NNSR permitting as well as title V operating permit provisions, including the potential use of cap-and-trade and market mechanisms.
- CAA title VI addressing ozone depleting substances, including the CAA §612 program for significant new alternatives and utilization of CAA §615, which requires a separate endangerment finding related to the stratospheric ozone layer.

- *2009 Endangerment and Cause or Contribute Findings for GHGs under Section 202(a) of the Clean Air Act*, 74 Fed. Reg. 66,496 (Dec. 15, 2009). The EPA Administrator found that six GHGs (CO_2, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) endanger both the public health and public welfare. In addition, the EPA Administrator determined that the combination of these six GHGs from new motor vehicles contribute to the GHG air pollution that endangers public health and welfare pursuant to CAA §202(a).
- *2010 Light Duty Vehicle GHG Emission Standards and Corporate Average Fuel Economy Standards,* 75 Fed. Reg. 25,324 (May 7, 2010). The rule promulgated both GHG emission standards for CO_2, methane, nitrous oxides, and hydrofluorocarbons for 2011-2016 light duty vehicles for 2011-2016 and comparable fuel economy (CAFE) standards promulgated by the Department of Transportation under its Energy Policy and Conservation Act authority.
- *GHG Emission Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles*, 76 Fed. Reg. 57,106 (Sept. 15, 2011). The EPA promulgated CO_2 standards (CO_2/ton-mile) for medium- and heavy-duty vehicles for MY 2014-2018 vehicles in weight classes 2b to 8 (*e.g.*, delivery trucks, vocational vehicles, transit, and school buses through long-haul tractor/trailer trucks). Utilizing new authority conveyed in the 2007 Energy Independence and Security Act, DOT promulgated comparable fuel consumption standards (gal/1,000 ton-mile). Additional credits were available for innovative and "off-cycle" emission reductions not measurable through traditional emissions testing.
- *2017 and Later MY Light-Duty Vehicle GHG Emission and Corporate Average Fuel Economy Standards*, 77 Fed. Reg. 62,624 (Oct. 15, 2012). This rule extended GHG standards for light duty vehicles to the 2025 MY, subject to a Mid-Term Evaluation of MY 2022-2025 standards; comparable CAFE standards through MY 2021 due to limitations in its authority; and "augural" standards applied for later MYs.
- *Standards of Performance for GHG Emissions from New, Modified and Reconstructed Stationary Sources: Electric Generating Units*, 80 Fed. Reg. 64,510 (Oct. 23, 2015). Established CO_2 standards for newly constructed, modified, and reconstructed fossil fuel-fired EGUs, both utility steam (1,400 pounds of CO_2 per megawatt-hour-gross (lb. CO_2/MWh-g) for new units and 1,800 or 2,000 lb. CO_2/MWh-g for modified sources) and stationary combustion turbines (1,000 or 1.030 lb. CO_2/MWh-g for baseload units).

- *Protection of Stratospheric Ozone: Listing of Substitutes for Refrigeration and Air Conditioning and Revision of the Venting Prohibition for Certain Refrigerant Substitutes*, 80 Fed. Reg. 19,454 (Apr. 20, 2015); *Protection of Stratospheric Ozone: Change of Listing Status for Certain Substitutes Under the Significant New Alternatives Policy Program*, 80 Fed. Reg. 42,870 (Jul. 20, 2015). These two rules utilized the Significant New Alternatives Policy (SNAP) program to require that certain end uses of certain high global warming substances be phased out on the basis of the existence of safer substitutes. Both rules, however, were later partially vacated and remanded to the EPA.[188]
- *Oil and Natural Gas Sector: Emission Standards for New, Reconstructed and Modified Sources*, 81 Fed. Reg. 35,824 (June 3, 2016). This rule set standards for both GHGs and VOCs, including hydraulically fractured gas well completions and equipment leaks at natural gas processing plants, pneumatic controllers, centrifugal compressors, and reciprocating compressors. A subsequent rule rescinded methane standards and altered VOC standards; this rule is currently in litigation and the rules are stayed pending further EPA review.
- *Finding that GHG Emissions from Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated to Endanger Public Health and Welfare; Final Rule*, 81 Fed. Reg. 54,442 (Aug. 15, 2016). This finding applied to the same six GHGs as addressed in the CAA 202(a) endangerment determination and found that emissions of these GHGs from certain aircraft are contributing to air pollution that endangers public health and welfare pursuant to CAA §231(a)(2)(A).
- *Standards of Performance for Municipal Solid Waste Landfills*; Final Rule, 81 Fed. Reg. 59,332 (Aug. 29, 2016). The rule lowered emission thresholds at which a landfill must install controls for reducing methane emissions.
- *GHG Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles – Phase 2*, 81 Fed. Reg. 73,748 (Oct. 25, 2016). The Phase 2 rule extended and expanded GHG emission standards for medium- and heavy-duty trucks through MY 2027. Consistent with the previous rule, the EPA defined separate engine standards, but also included regulations affecting vehicle trailers and included additional modeling inputs to define vehicle standards. NHTSA promulgated "maximum feasible" standards utilizing gal/1000 ton-mile metric.
- *Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures*, 86 Fed. Reg. 2,136 (Jan. 11, 2021). The EPA adopted standards that are applicable to certain classes of subsonic aircraft, applying a standard for CO_2 emissions equivalent to that adopted by the International Civil Aviation Organization. The standard applies on the basis of a "whole airplane design" that accounts for aerodynamics, airplane weight, and engine propulsion technologies. EPA regulations specify a fuel efficiency metric value that utilizes the specific air range of an aircraft and a reference geometric factor related to the size of an aircraft's fuselage.

- *Renewable Fuel Standards (2006-present)*. Apart from regulations dependent upon the EPA's endangerment and cause and contribute determinations, the EPA has promulgated a series of rules that provide for annual renewable fuel standards. Beginning with the enactment of the Energy Policy Act of 2005, the EPA was directed to promulgate rules specifying a quantity of renewable fuel to be blended into transportation fuel (primarily gasoline and diesel). Congress expanded the RFS program in 2007 (Energy Independence and Security Act of 2007). Through 2020, the EPA promulgated approximately a dozen rules and determinations specifying annual standards for compliance years 2006-2020.
- *NSPS for Fossil Fuel-Fired Generation* (2012-present). The long history of EPA rulemaking efforts in this area, along with related litigation and litigation outcomes, is beyond the scope of this report. The EPA has proposed and finalized different approaches to define standards of performance for the existing fossil fuel fired EGUs, most notably with regard to the Clean Power Plan[189] and the Affordable Clean Energy Rule.[190] Pursuant to litigation, neither of these rules are currently in effect.[191] Currently, CAA section 111 GHG standards only apply to new, modified, and reconstructed sources.[192] Despite this lack of final regulation, however, GHG emissions from power plants peaked in 2007 and are now at the lowest level since the late 1970's.[193] While many factors contribute to this decrease, including a decrease in coal generation and corresponding increase in gas-fired generation, it is certainly noteworthy that EPA regulations (even if targeted at other pollutants) have contributed to this decrease.
- *GHG Reporting Rules*. Since 2009, the EPA has issued a series of reporting rules for GHGs from various source categories.[194] These rules require annual reporting above specified thresholds for sectors of the US economy under actions taken pursuant to annual appropriations legislation.[195] The EPA was directed under these enactments to use its existing authority under the CAA to require reporting and has exercised authority contained in CAA sections 114 and 208.

Opportunities

While we would note the progress outlined above with respect to regulating major industry segments that contribute to climate change, it is clear that multiple opportunities remain. Some of the challenges/opportunities are technical and analytical in nature, such as defining what alternatives exist to current industry practices and products. But, significant legal and policy issues also remain with respect to the utilization of the CAA to control GHG emissions. With respect to these issues, any single analysis of CAA legal authority could easily demand a lengthy discussion, including a range of informed opinion. This section endeavors to discuss each area briefly, but with enough context in order to identify the main issues and perspectives.

In general, opportunities obviously exist within the scope of GHG sources that may be subject to control under the CAA.

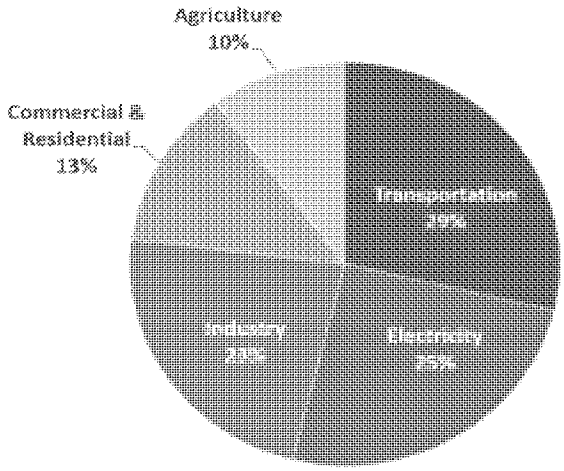
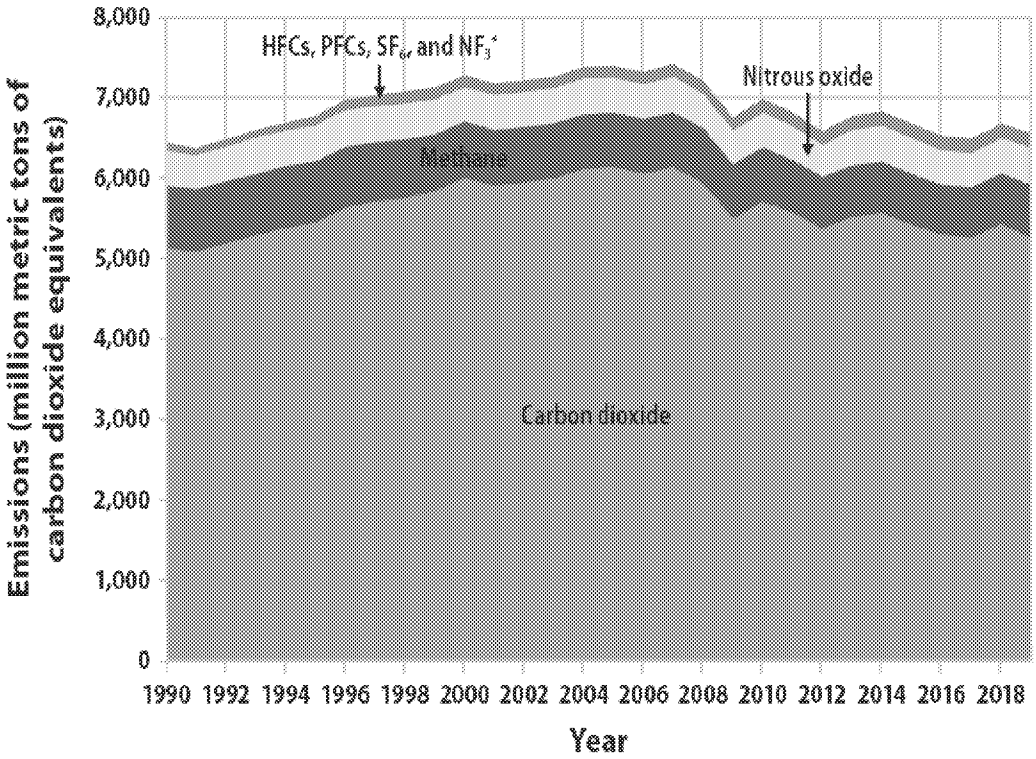


Figure 6. Total US GHG Emissions by Economic Sector in 2019



* HFCs are hydrofluorocarbons, PFCs are perfluorocarbons, SF_6 is sulfur hexafluoride, and NF_3 is nitrogen trifluoride.

Data source: U.S. EPA (U.S. Environmental Protection Agency). 2021. Inventory of U.S. greenhouse gas emissions and sinks: 1990–2019. EPA 430-R-21-005. www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks.

For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climate-indicators.

Figure 7. US GHG Emissions by Gas, 1990-2019

EPA rulemaking to date has involved two large sectors of GHGs: fossil fuel-fired EGUs and transportation. The EPA is also currently engaged in rulemaking to address HFC emissions, albeit such actions are being taken under statutory authority outside of the CAA.[196] In addition, major sources seeking preconstruction permits may also be required to assess and potentially control GHGs. Therefore, the EPA may continue to utilize its CAA authority and engage in additional rulemaking for these segments of the economy and potentially other segments, *e.g.,* additional sources subject to CAA section 111 performance standards. In addition, the Paris Climate Accord provides a framework for countries to develop a Nationally Determined Contribution and to report actions taken to address GHG reduction goals. But, as outlined below, broader action will need to involve additional assessment of EPA authority under the CAA with additional rulemaking conforming to that authority.

Future Challenges

1. Extent and Limits of CAA Authority

To date, the EPA has utilized CAA §§111(a), 111(d), 202(a), 231 and 612 to promulgate standards or regulations directly affecting the emission of GHGs. As noted above, the EPA has utilized its CAA authority to regulate fossil fuel-fired EGUs, light-, medium-, and heavy-duty vehicles, aircraft, and hydrofluorocarbons contained in certain products or used in a specific application. EPA implementation of the CAA over this period therefore can provide valuable "lessons learned" as well as insight into future challenges.

But while the EPA has promulgated regulations – and in some cases multiple regulations – under these CAA authorities, some significant potential sources, or aspects of EPA authority to regulate GHG emissions under the CAA are currently untested as well as potential limitations to such authority. For example, with regard to mobile sources, the EPA has either chosen or is restrained by the Act to promulgate standards in increments of several MYs.[197] In addition, where exertion of CAA authority requires technical assessments and/or consideration of feasibility or costs, there may be practical limits that the agency has not yet reached or defined, which can impact the scope and character of resulting standards. Other open issues occur with respect to the form that CAA standards may take, including the extent of compliance flexibility that may be allowed under various provisions. Opinions differ on these issues, but the extent of CAA authority to control GHGs is largely a matter of legal analysis and the caselaw that has been generated to date. No single regulatory provision of the CAA was enacted to control GHGs, such as title IV of the CAA enacted to address acid rain from the EGU sector.

At the same time, an increasing body of scientific evidence points toward multiple effects emanating from climate change, including extreme weather conditions. These effects, indeed, could complicate efforts to address climate change. But while the EPA received multiple petitions to regulate GHGs under other provisions of the CAA, the Agency has not thoroughly analyzed the full potential or limitations of its CAA authority to regulate GHGs under the Act, at least in a public fashion, since the 2008 ANPRM. Nor has the Agency expressed a coherent view with regard to how different measures might be integrated to reduce GHGs.

In some respects, this is the result of a rulemaking process focused on specific sources and statutory authorities. But this also means that it is not possible to know, with precision, the extent of CAA authority to reduce US GHG emissions to "net zero," or to some value above this level over time.[198]

Apart from the CAA provisions cited above, various analysis has been published regarding:

- Promulgation of NAAQS for GHGs pursuant to CAA §§108, 109
- Utilization of CAA 112 to promulgate HAP standards for sources of GHGs
- Use of CAA §115 to regulate GHGs on the basis of pollution emitted in the US endangering public health or welfare in foreign countries, where reciprocity exists
- Utilization of CAA §615 to regulate GHGs on the basis of their effect on the stratosphere, especially ozone in the stratosphere.

We will briefly discuss each provision in turn.

1.1 CAA §§108-110 (GHG NAAQS)

CAA §108 allows the EPA to publish a list of "each air pollutant" which may "reasonably be anticipated to endanger public health and welfare . . . [which] results from numerous diverse mobile or stationary sources . . . for which [the EPA Administrator] plans to issue air quality criteria." Presuming that this criteria could be met, the EPA would need to propose primary and secondary standards for GHGs pursuant to CAA 109.[199] Final standards would be those "requisite to protect the public health [and] public welfare."[200] Promulgation of GHG NAAQS would then trigger obligations on the part of states to submit SIPs that demonstrate how each state will attain and maintain the GHG NAAQS and include enforceable emission limits and other control measures.[201]

Multiple questions have been raised with regard to whether a GHG NAAQS either comports with CAA NAAQS provisions (including implementation provisions) and/or is feasible to implement for globally-mixed pollutants, rather than air pollution that primarily affects local air quality.[202] The EPA has adopted different views on this issue, rejecting a petition to establish a GHG NAAQS and then reversing its position.[203] Some have argued that a GHG NAAQS is possible, since the EPA may develop a design value that is not simply based on the level of GHGs in the atmosphere, but rather with respect to limiting temperature increases and to establish benchmarks.[204] This, arguably would allow the EPA to extend compliance deadlines past the maximum 10 years allowed under the CAA for attainment of a primary NAAQS by relying instead on implementation provisions requiring reasonable further progress.[205] Alternatively, it has been suggested that the EPA could simply set a secondary GHG NAAQS under which no statutory deadline for a GHG NAAQS would apply.[206]

Others have maintained that NAAQS are inherently ill-suited for GHGs, given the inability of states to control sufficient sources to reach attainment, or the ability of the EPA to promulgate a realistically achievable standard, given that the EPA is prohibited from considering the cost of implementing the standards when setting a NAAQS.[207] In other words, the EPA could be faced with a Hobson's choice: if the Agency set a GHG NAAQS so as to be attainable, the Agency would not suitably address the statutory criteria for setting a NAAQS; or if the EPA set a NAAQS at a "protective" level, the entire country would remain out of attainment for decades, and states would have no means to attain the standard. The EPA has long recognized these difficulties.[208]

1.2 CAA §112 HAPs (GHG MACT)

CAA §112(a)(6) provides the EPA with authority to revise the statutory list of HAPs to add "pollutants which present, or may present, through inhalation or other routes of exposure, a threat of adverse health effects . . . or adverse environmental effects . . ." Presuming a showing of adverse effects could be made, the EPA would be required to set standards "for each category or subcategory of major sources and area sources of HAPs" based on "the maximum degree of reduction in emissions . . . taking into consideration the cost of achieving such emission reductions [and other factors the Administrator] determines is achievable for new or existing sources . . . through the application of measures, processes, methods, systems or techniques . . . ." In shorthand, these standards are referred to as MACT standards, and for existing sources, are developed based on the "best performing" 12 percent of sources. For new sources, MACT standards are based on the best controlled similar source. MACT standards are subject to subsequent RTRs.[209]

Some opinion has favored the CAA §112 approach, given it focus on available technologies and other available methods to control GHGs. This focus, along with subsequent RTRs of CAA 112 standards would allow for the EPA to consider feasible levels of control for a wide range of sources "in a new, comprehensive and significant manner."[210] Other opinion has considered CAA 112 standards to be a "poor fit" for regulating GHGs, given: (1) definition of "major sources" as those emitting 10 tpy of one HAP or 25 tpy of a combination of HAPs, meaning that numerous relatively small sources would need to be controlled, and the need to impose "maximum" reductions.[211] In addition, the allowable timeframes for regulation of sources under CAA 112 are relatively short, in terms of the longer timeframes generally considered necessary. The EPA's 2008 ANPRM also noted that a relatively large number of source categories and subcategories (over 170) would need to be addressed.[212]

1.3 CAA §115 International Air Pollution

A significant amount of attention has been devoted to the consideration of whether CAA §115 could provide authority for the EPA to regulate GHGs in an "economy-wide" program, potentially in conjunction with the Paris Agreement or other international measures to address climate change. CAA §115 actually predates the 1970 CAA and has been amended since its original enactment.[213] In its current form, it provides that "[w]henever the Administrator [based on information] has reason to believe that any air pollutant or pollutants emitted in the US cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare in a foreign country . . . the Administrator shall give formal notification thereof to the Governor of the State in which such emissions originate." This notice, in turn, "shall be deemed" to be a finding under CAA section 110 requiring a state to revise its applicable SIP. CAA §115 contains a "caveat" however, that the section is only to apply to a foreign country that has "given the US essentially the same rights with respect to the prevention or control of air pollution occurring in that country as is given that country by [section 115]." This last provision is typically referred to as the reciprocity provision.

It has been argued that the legislative history of this provision supports its use to address climate change because both the then-current President and Members of Congress described CO_2 as "an air pollutant" when the provision was enacted,[214] and that the specific language in the provision requiring a reciprocity determination can be met with respect to the 195 signatory countries of the UNFCC, or a smaller subset through international negotiations.[215] It has also been argued that the EPA could use the provision's focus on SIPs to allocate to each state their respective "share" of the emission reductions necessary to address the endangerment while preserving reciprocity.[216] Further, it is argued that these state plans could use cost-saving, market-based mechanisms and be effectively backstopped by FIPs if necessary.[217]

This interpretation of the CAA is not without dispute. Some have argued that other provisions of the CAA are constrained to address emissions within the US and that CAA 115 cannot be read to allow the EPA to take whatever actions are necessary to address widespread air pollution outside of the country, but rather is limited to cross-border endangerment.[218] Other arguments have noted that Congress would not have conveyed broad authority to the EPA to regulate GHG air pollutants within CAA 115, noting the oft-quoted phrase that Congress . . . does not . . . hide elephants in mouseholes."[219] Finally, questions have been raised with respect to how the EPA would ensure that any required SIP revisions would be in accordance with the limitation in §115 that the section only applies to a foreign country which provides reciprocal rights and how such reciprocity would be determined. These arguments, in turn, have been rebutted in other commentary.[220]

1.4 CAA §615 Authority of the Administrator (Title VI)

CAA §615 provides that if in the EPA Administrator's judgment, "any substance, practice, process, or activity may reasonably be anticipated to affect the stratosphere, especially ozone in the stratosphere and such effect may reasonably be anticipated to endanger public health or welfare, the Administrator shall promptly promulgate regulations respecting the control of such substance, practice, process or activity . . ." Therefore, the endangerment determination required under this section is distinctly different from endangerment provisions found in other parts of the CAA, including CAA §§111 and 202.

While the EPA has cited CAA §615 in past rulemakings, the Agency, to date, has not made an explicit endangerment determination regarding GHGs under this authority.[221] A petition filed with the Agency in 2013 requested that the Agency issue a "public call for information . . . concerning the interaction between GHGs and the stratosphere."[222] The petition also advocated for a market-based regulation for GHGs under title VI, arguing that the EPA had such discretion under the language of §615.[223]

The EPA has previously described CAA §615 as "intended to augment other authorities and responsibilities established by Title VI."[224] In 2008, the EPA also noted that it would need to "assess and analyze the available scientific information on the effect of GHGs on the stratosphere."[225] But at the same time, the Agency described the regulatory authority conveyed by the section as broad, potentially including the ability to establish a "cap-and-trade" program.[226] Given the relatively nascent state of EPA utilization of/reference to CAA §615, however, relatively less academic and analytical attention has been paid to this authority. Some have noted that "[a]ttempting to create a broad regulatory program based on such sparse language "is relatively unlikely to survive legal challenge."[227]

2. Technical and Analytical Requirements

A number of views have been expressed with regard to the potential to effectively address climate change through the CAA. Some expressed or endorsed the view that the EPA should view climate change as an existential challenge requiring the Agency to focus on key contributors to GHGs and use the full extent of its authority to forcefully reduce emissions in the near and longer-term. Others have agreed with the urgency of the need to act but have indicated that it would be preferable for Congress to enact new legislation to direct the effort. Additional views have endorsed looking at GHGs as a co-pollutant under the CAA, because in many cases GHGs may be emitted as a byproduct of combustion that the EPA could control, in conjunction with improving air quality in general.

Whatever overarching approach the EPA takes to these issues, the Agency must improve its technical and analytical ability to analyze different approaches to address climate change. While the Agency has, in some sense, focused on relatively large sources of GHG emissions, over the longer term, the EPA must assess alternative actions, not only with regard to individual rulemakings, but in connection with other efforts underway at different governmental levels and within industry. Specific areas of focus should include the following:

2.1 Role of federal and state/local programs

State and local regulations to control GHG emissions have taken many forms. In California, Assembly Bill 32 (AB32), approved in 2006, required the California Air Resources Board to adopt GHG regulations to reduce such emissions to 1990 levels by 2020. The state currently has a 2030 target of a 40 percent reduction in GHG emissions by 2030, supported by a cap-and-trade rule and other initiatives regarding transportation, renewable energy, high global warming gases, and a low carbon fuel standard. Other states have utilized Executive Orders and Memorandum of Understanding agreements to set GHG targets, as well as employed renewable portfolio standards.

It is beyond the scope of this report to either list or analyze all such state or local initiatives, but the CAAAC Work Group identified as a significant issue the coordination of federal, state, and local GHG initiatives, including potential overlaps and inefficiencies. In this regard, CAA §116 provides that except as otherwise preempted, the Act does not "preclude or deny the right of any State or political subdivision thereof to adopt or enforce . . . any standard or limitation respecting the emission of air pollutants," except with respect to CAA §§111 and 112, standards or limitations that are less stringent than applicable under those sections. But whether or not state and local governments may act apart from federal efforts does not address the need to avoid conflicting or inefficient requirements involving the allocation of limited resources. The EPA may not exceed its authority, but it need not duplicate efforts in an effort to simply exert its authority. It has been the traditional role of the EPA to lead by example, and the EPA has access to considerably more technical and analytical resources than are available in individual states.

2.2 Lifecycle accounting of GHG emissions

CAA §211(o), Renewable Fuel program, contains provisions that explicitly define lifecycle GHG emissions for renewable fuels as well as the required minimum level of lifecycle emissions for different renewable fuels.[228] But there are no comparable provisions contained in other CAA authorities that have been identified as potential sources of authority for the EPA to control GHGs.[229] This raises the issue with respect to how lifecycle emissions can or should be accounted for within future CAA GHG regulations and, if so, how to avoid duplicative regulation or inefficiency. The EPA has assessed such information as part of current GHG reporting programs but has not explained how it will address this issue with respect to the exertion of its regulatory authority in any comprehensive manner.

2.3 Embedded/embodied carbon in products

One facet of lifecycle accounting involves accounting for GHGs within finished products, where different materials, manufacturing methods, and transportation requirements may present different emission profiles for the same product. Some maintain that a granular assessment of embedded carbon is essential, for example, with respect to building materials where the "end product" may be relatively indistinguishable with respect to the energy requirements for maintaining the structure and its environs, but upstream emissions can be variable based on the materials chosen and related sourcing. For example, the accumulated carbon from battery production is an important consideration in the assessment of the impact of electric vehicles.[230] To the extent that lifecycle analysis is supported by the underlying statutory authority and appropriate within the context of GHG rulemakings, the issue arises as to how to ensure consistency in the regulation of different source categories for which different levels of information may or may not be available. To the extent that lifecycle emissions are modeled, additional issues arise with respect to modeling inputs and assumptions.

2.4 Creditable offsets

A similarly difficult analytical issue to lifecycle analysis occurs with respect to the calculation and verification of creditable GHG offsets. In the context of the CAA, title IV of the Act provides a historical example concerning how offsets (in the form of allowances) may be created (by emitting less SO_2 than allowed) and then utilized by other sources (through purchasing SO_2 allowances) where it may have been less economically or technically feasible for a source to directly reduce emissions. Similar cap-and-trade/offset systems have long been discussed as a model for obtaining cost-effective GHG emission reductions.[231]

But the complexities of a GHG cap-and-trade system utilizing creditable offsets are considerably more complex than the task that the EPA faced when promulgating regulations to implement the Acid Rain program pursuant to detailed statutory authority approved as part of the 1990 CAA Amendments. While in some applications (*e.g.*, the utility sector) it could theoretically be relatively straightforward, other sectors lack contemporaneous monitoring for CO_2 and other GHGs. In addition, the ability of one sector to trade with another regulated sector through an allowance system raises multiple issues, including the relative cost of generating emission reductions, varying systems to "verify" credits and how to address the different atmospheric lifetimes of various GHGs. In addition, for offsets from other regulated as well as "non-regulated" sectors, the amount, origin,[232] and "permanency" of offsets may be an issue.

2.5 Fuel switching

We have already experienced fuel-switching in the electric generation sector where the consumption of coal for electric generation has substantially declined over the last decade, not only in the US, but within the European Union (EU).[233] The issue of how the CAA may be utilized to require or incentivize fuel switching is complex and dependent on the specific authority sought to be utilized. The most apparent example of uncertainty in this area probably lies within the electricity generation sector, given the current uncertainty of the extent of CAA authority contained in CAA §111.[234] But fuel use issues can arise within other potential CAA §111 rulemakings and within the mobile source sector.

2.6 Interagency cooperation

While the CAA addresses air pollutants, a general sentiment during CAAAC discussions was expressed that the EPA should facilitate and be responsive to actions taken by other federal agencies and departments regarding GHGs and climate change, both from the perspective of avoiding duplication of effort and conflicting results.

Recommendations

1. The EPA Should Comprehensively Review and Further Define its CAA Authority to Address GHGs and Climate Change.

It has been 13 years since the EPA comprehensively reviewed its authority to address GHGs under the CAA and solicited public comment on the same. In this time, the Agency has been able to move forward with a series of rules regarding the mobile source sector addressing light-, medium-, and heavy-duty onroad vehicles, and many types of commercial aircraft. During the same time period, however, the Agency has been unable to implement GHG standards for existing fossil fuel-fired powerplants.[235] Regulations to address methane from oil & gas operations have also been in flux,[236] and regulations controlling HFCs in a comprehensive manner are still in the process of regulatory development (and currently relying on statutory authority outside of the CAA). Ensuring a sound legal basis for future rulemaking efforts is critical both for addressing climate change and providing clarity for the regulated community.

This is not to criticize the Agency's efforts, or to ignore that differing policy approaches that were adopted by different Administrations – much less the often-intricate legal issues that can attend to CAA rulemakings. But on a fundament level, it is evident that a considerable amount has changed since the EPA's initial assessment of its CAA legal authority following *Massachusetts v. EPA*. The EPA's CAA rules addressing GHGs have been both upheld and vacated by the courts and the scope, sufficiency, and legal defensibility of future CAA rulemaking simply cannot be assumed. Therefore, the first recommendation is that the EPA conduct a new, public review of its CAA authority to address GHGs based on its experience over the last decade and solicit additional public opinion on the most productive approach for the Agency to take in the coming decade. At minimum, this review should include the CAA authorities identified above in section 1 of "Challenges" to help better define the scope of authority available to the Agency.

1.1 The EPA should issue a new ANPRM or similar public document analyzing available CAA authority to address GHGs under the CAA and soliciting public comment.

1.1.1. The EPA should reexamine authority pursuant to CAA 108, 109, 111, 112, 115 and 615.

On January 19, 2021, the EPA denied three long-filed petitions to the Agency requesting that the EPA regulate GHGs pursuant to its authority to set NAAQS under CAA §§108 and 109,[237] to address GHGs pursuant to CAA §115, and to regulate GHGs as a HAP under CAA §112. On March 4, 2021, the EPA in a short notice indicated that it was withdrawing these determinations. Both efforts were, and remain, insufficient to fully address the challenge of climate change and the serious issues that underlie the EPA's legal authority to address GHGs under the CAA.

With respect to the January 19, 2021, determination, much of the analysis of the petitions is frankly cursory and based on a mix of legal and policy arguments. Significant portions of the determination also rely on comments filed by other agencies in connection with the EPA's July 2008 ANPRM, which were notably not views that were fully analyzed nor adopted by the Agency.[238] Thus, the analysis underlying the denial is not only 13 years old, but it also does not reflect the full breath of EPA analysis of its available authority in the multiple rulemakings it has undertaken since *Massachusetts*. With regard to the EPA's withdrawal of the denial of the petitions addressed in the January 19, 2021, determination, the Agency's response is even more severely limited. The EPA indicated only that the "agency did not fully and fairly address issues raised by the petition."[239] But the EPA gives no indication of what specific information gaps exist nor how it specifically considered the process by which the initial determination by the Agency was made to be "unfair." The Agency did not address what procedural defects were the source of the unfairness, nor what issues may have been addressed and what issues not.

Given the enormity of the issue and the importance to many sectors of the economy and many members of the public as to how the EPA will seek to address on climate change, the Agency should not leave core legal issues – in some cases raised with the Agency over 20 years ago[240] – unaddressed or addressed in a piecemeal fashion. Rather, the EPA should undertake a new review, in a public fashion, of the extent of its authority under the CAA to address GHGs. Whether this takes the specific form of an ANPRM or not is not the important issue. The issue is that CAA authority in the area of GHGs and climate change should be fully expressed, even where such analysis may reveal limits to that authority. The present uncertainty over the extent of that authority, how and when the EPA may or may not utilize different authorities, and how the Agency may address issues concerning smaller sources and/or de minimis emissions have either not been fully vetted or not fully expressed by the EPA under several past Administrations, despite Supreme Court decisions affirming both the Agency's authority to regulate GHGs as "air pollutants," and interpretation that this authority is context-specific.[241]

The CAAAC would understand that this may be contrary to long-standing practice, that the Agency rarely if ever describes the limits of its potential legal authority. But both the extent and the limits to CAA authority are vital to a full understanding of what actions may or may not be taken and what additional legal authority may or may not be needed by the EPA or other parts of the government. In essence, there is no longer any benefit to the Agency or the public in keeping one's powder dry on important legal issues affecting climate.

In connection with this review of the EPA's legal authority under different provisions of the CAA, the Agency should also detail and examine relevant policy issues. For example, with regard to a GHG NAAQS, how the "cooperative federalism" structure of the Act would be implemented should be explored. Fundamentally, whether or not a primary or secondary NAAQS is utilized, responsibility for planning how to achieve attainment is relegated to the states. Thus, questions of adequate resources, planning tools, and the ability to undertake different approaches to develop acceptable SIPs must be examined. The EPA would not avoid these issues if it attempted to utilize CAA §115; some have suggested, however, that a "model rule" could be used to simplify implementation and promote uniformity in response.[242] But findings of SIP inadequacy could be triggered and perhaps complicated by provisions providing for the participation of foreign countries at public hearings concerning "any revision of the appropriate portion of the applicable implementation plan."[243] With regard to CAA §615, some analyses have been developed pointing to the interaction between GHGs and climate change and stratospheric ozone depletion, with GHGs contributing to cooling in the stratosphere and conditions that may be more conducive to ozone depletion.[244]

Other policy issues arise in connection with the exertion of other authorities. Specifically, it is not clear whether the EPA may utilize fees or other economic measures in order to implement CAA provisions, apart from specific authority contained in CAA §110.[245] Cap and trade mechanisms have been used with regard to certain programs, such as interstate air pollution control efforts, but apart from Title IV, explicit authority is again lacking, at least in some parts of the CAA. The EPA therefore should explore policy issues involved with utilizing different approaches to addressing climate change under the CAA and whether these policy outcomes would be more or less beneficial than other options, including options for additional legislative authority.

1.2. The EPA should clearly articulate what implementation methodologies may be available to include cap-and-trade, financial mechanisms and incentive programs.

As expressed through this report, there are numerous law review articles and opinion pieces that define a preferred option for the control of GHG emissions. While outside the scope of this report, adding a price to carbon has long been a topic of academic and political discussion. But within the confines of the CAA, the EPA should articulate what available regulatory mechanisms exist in terms of authority to utilize emission allowances in cap-and-trade regimes or other market or financial mechanisms, specifically with respect to the identified CAA sections for GHG regulation. CAAAC would recognize that questions concerning the extent of EPA authority will inevitably arise in these areas and that, in some areas, there may not be existing caselaw to serve as guidance to the Agency. But the EPA should strive for transparency at the possible price of expediency.

1.3. The EPA should define how implementation of CAA authority can occur in connection with authority and programs available to other federal departments and agencies.

Other federal departments and agencies have both legal authority and funding to take steps to address GHGs and climate change. Examples are numerous and will not be recounted in this report. The Department of Energy has multiple programs to fund both energy efficiency efforts as well as longer-term research and development of breakthrough energy technologies. The Department of Transportation has authority with respect to fuel economy standards and federal highway projects that can promote better use of energy resources devoted to moving people and goods. Department of Agriculture programs can have important impacts on land use and carbon sequestration.

While interagency cooperation and coordination exists within many spheres of the Executive Branch, it is also true that interagency conflict and competition can exist. This has occurred in the past both with respect to energy efficiency standards and mobile source regulations, but can extend into other areas, including renewable fuels and energy projects. Obviously, there is no one easy solution to intergovernmental coordination. But this issue should be recognized as a potential source of inefficiency – and in some cases a cause of delay or deferral. To the extent possible, we would urge the EPA to be proactive in this area and identify areas of potential conflict and cooperation regarding GHGs and climate.

2. The EPA Should Continue to Focus on Reducing Emissions from Major Sources of GHGs.

2.1 Following promulgation of the Clean Power Plan and Affordable Clean Energy Rule and related litigation, the EPA needs to refocus efforts on electric power generation.

In the last 7 years, the EPA has proposed two different approaches to regulating GHGs from existing EGUs pursuant to CAA §111(d),[246] and the Agency has finalized two different rules.[247] These rules were generically known as the Clean Power Plan and the Affordable Clean Energy Rule. Intensive litigation occurred with respect to both rulemakings which will not be recounted or explained in any detail in this report. However, as a result of litigation in the D.C. Circuit, the Affordable Clean Energy Rule was vacated as well as that rule's repeal of the Clean Power Plan.[248] The EPA subsequently requested that the court issue a partial mandate in this litigation, with the net result that the court's vacatur of the EPA's repeal of the Clean Power Plan is currently stayed to allow the EPA to engage in new rulemaking. Thus, at present, the Agency is in some sense back to step 1 with regard to the issue of regulating GHGs from existing fossil fuel-fired EGUs under the authority of the CAA; no current rule for existing sources is in effect.

As noted earlier, this regulatory/litigation impasse has not prevented the reduction in actual emissions of GHGs from EGUs. The EPA estimates that GHG emissions from electric generation in 2019 comprised 25% of US GHG emissions and 31% of CO_2 emissions. Between 2005 and 2019, CO_2 emissions from electric generation declined by 19%.[249] But at 25% of overall GHG emissions, electric generation ranks roughly on par with emissions from transportation (29%) and industry (23%).[250] The issue going forward is how the EPA will address GHG emissions from this major sector using the CAA.

Opinions of CAAAC members vary with regard to EPA authority pursuant to CAA §111(d) and the extent to which states may vary implementation relative to EPA guidelines concerning existing EGUs. General agreement, however, may be found to exist with respect to the promulgation of legally defensible guidelines for existing sources. Given the lengthy litigation history of CAA §111(d), it should be evident that newly proposed rules be firmly grounded in statutory analysis and backed by thorough Technical Support Documents. In brief, we would advise the Agency that while the importance of controlling existing EGUs is evident by their sizeable share of overall US GHG emissions, it would be unproductive for the Agency to enter a third round of CAA §111(d) guidelines and associated FIPs that was not firmly rooted in available authority.

2.2. Engine and vehicle standards should continue to utilize flexible credit programs.

The situation confronting the EPA is different with regard to mobile source emission standards. As outlined above, the EPA has successfully promulgated five rules addressing GHGs from light-, medium-, and heavy-duty vehicles, and aircraft engines. All rules became legally effective and, in some cases, have been implemented by the EPA and the NHTSA for over a decade. Light-duty GHG standards have been in place since MY 2011, and medium- and heavy-duty standards since 2014.

The CAAAC is cognizant of issues involving the Safe Affordable Fuel-Efficient Rule and the fact that this rule partially replaced more aggressive light-duty standards for MYs 2021-2025 contained in the National Program promulgated in 2012. (More detailed discussion of issues for mobile sources may be found in the mobile source emissions section of this report). The CAAAC would note, however, that legal uncertainty is not confined to CAA §111 and stationary source rules, despite the Agency's relative success in either avoiding or surviving judicial review in the area of mobile sources generally.

The CAAAC would therefore advise that the EPA continue to implement title II emission standards using flexible compliance measures that do not provide inordinate incentives to specific technologies. While various rulemakings have utilized credit incentives for new and developing technologies (*e.g.*, advanced vehicle credits) the EPA should be well aware that numerous policy issues can arise in this area. Given the relatively lengthy process ahead, similar to the electric utility generation sector, the EPA should strive for legal defensibility and broadly achievable standards that allow individual regulated parties to address the substantial technical challenges that may lie ahead.

2.3. The EPA should address industrial sources in a coherent and transparent manner.

Outside of EGUs, the EPA has promulgated NSPS for municipal solid waste landfills and new, modified, and reconstructed oil and gas well sites, gathering and boosting stations, processing plants, and compressor stations. The EPA also finalized revisions to these rules, which have recently been vacated.[251] Currently over 60 source categories and subcategories exist for which the EPA has finalized NSPS.

The CAAAC is aware that the EPA has a degree of discretion concerning the "manner, timing, content, and coordination of its regulations with other agencies."[252] The CAAAC is also aware that the EPA has generally sought to address the larger CAA §111 source categories first. However, the EPA has not articulated a plan, or even a general outline, as to how it intends to approach the longer-term regulation of industrial sources under its available CAA §111 or other authority in the CAA. Given the relative size of industrial sources, the EPA should articulate what specific approaches, policy perspectives, and industrial source categories it intends to address, in what timeframe, and to what intended degree of stringency.

3. The EPA Should Define How Implementation of CAA GHG Programs Can Occur in Connection with State and Local Programs Designed to Address GHG Emissions, Including Potential Conflicts.

State initiatives in the area of GHGs are nothing new. The Regional GHG Initiative was initiated by 10 Northeastern states in 2005. There were also efforts in the Midwest and West in subsequent years to establish multistate agreements to guide GHG emission reductions. New coalitions have been formed with Memoranda of Agreement on such issues as the level of powerplant regulation and adoption of new vehicle standards. We have previously cited California's long-standing statutory and highly-developed regulatory mechanisms.

As the regulation of GHGs in the US "matures" at levels other than the federal government, the EPA should define how its actions under the CAA can occur in conjunction with state and local programs and/or in a manner in which regulatory overlap is reduced. States retain authority under CAA §116 to promulgate standards that may be more stringent than those the EPA promulgates under the CAA. In some cases, however, it may be more efficient for the EPA to promulgate national standards, rather than hazard a state-by-state piecemeal approach. In other areas, states and localities may be more able to address the needs of their localized environment and economies. It would appear improbable for the EPA to predict all future state and local actions in this area, much less analyze how conflicts can be avoided in every instance. But it would be helpful for the Agency to articulate a set of policies and approaches, in specific related to its ongoing GHG rulemaking process, that better define how it will approach this issue.

4. The EPA Should Consider Regulatory Mechanisms Which Can Incentivize Behavior.

During CAAAC discussion of this section, a recommendation was made that the EPA should consider regulatory mechanisms which can incentivize behavior. The EPA has utilized many different mechanisms to reward early actors in other CAA programs, *e.g.*, allowing for additional credits for innovative technologies or the accumulation of credits for use at later stages of an emission control program. These mechanisms were noted above with regard to mobile source programs but could also be extended to other sectors.

5. The EPA Should Issue a NODA Regarding Measurement and Accounting Methods for GHG Emissions, Including Lifecycle Emissions and Embodied Carbon.

In discussions concerning this section, CAAAC members stressed the need for clear accounting rules for lifecycle emissions and the need to coordinate EPA activities with that of other agencies, including the Department of Energy. To the extent that lifecycle emissions are accounted for and addressed in EPA rulemakings, the agency's approach should be consistent with that employed by other elements of the federal government. Threshold issues exist with regard to how lifecycle emissions accounting should be conducted, and any differences in approach should be resolved in interagency discussion and agreement prior to the promulgation of rules.

In addition, the subject of GHGs (*e.g.*, carbon) embodied in products was also discussed. This issue can occur both with respect to domestic and imported products, but concern was expressed that US companies would be placed at a disadvantage through the importation of products that may be subject to less rigorous accounting of their overall impact on GHG emissions. Embodied carbon is a term that is often associated with building materials, but the issue of accounting for GHG emissions associated with products also has a broader context.

The CAAAC recognizes that these issues may present the Agency with difficult technical challenges and that approaches may indeed vary over time (*e.g.*, as modeling is revised and enhanced). The CAAAC also recognizes that this is an area where academic dispute may arise; there may be legitimate debate concerning the validity of different approaches. But, the CAAAC believes that the EPA should embrace the challenge and create an open discussion of alternatives through a Notice of Data Availability or similar public effort.

6. The EPA Should More Explicitly Address Expected Co-benefits and Any Disbenefits from Controlling Criteria and Other Non-GHG Pollutants.

During CAAAC discussion of this section, a recommendation was made that the EPA should explicitly address the co-benefits from controlling criteria and other non-GHG air pollutants. In addition, the EPA should analyze and address any GHG disbenefits that may be associated with controlling criteria and other non-GHG air pollutants, *e.g.*, air toxics with low-GWP.

7. The EPA Should Proactively Address Potential GHG Issues With Respect to Imported Products.

During CAAAC discussion of this section, a recommendation was made that the EPA should address GHG issues with respect to products imported into the US. Similar to issues discussed above in paragraph 5, the EPA would need to resolve issues – in different contexts with regard to different products – as to how lifecycle impacts would be assessed.

8. The EPA Should Enhance Web-based Information on GHG Standards to Include Full Regulatory History and Supporting Documents.

The EPA's adjustments to its website have not always promoted transparency. In some cases, information has been made more difficult to find. The EPA should reconstitute its internet presence with an emphasis on not only present current regulatory efforts and policies, but with regard to providing a public resource for retrieval of prior EPA legal, policy, and regulatory documents addressing GHGs. All prior proposed rulemakings, final rules, and technical documents should be easily accessible, and archival policies should be examined.

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162 DRAFT Inventory of US GHG Emissions, and Sinks, 1990-2019, EPA 430-R-21-001 at ES-5.

163 Some estimates predict a 10.3% drop in GHG emissions in 2020. *See* https://rhg.com/research/preliminary-us-emissions-2020/, last accessed on 4/11/2021.

164 Draft Inventory.

165 For example, Clean Air Act section 111(d) requires EPA to utilize a procedure under which each state submits a plan to establish standards of performance for existing sources, and states may take into consideration the remaining useful life of existing sources.

166 The authors of this report acknowledge that the full extent of this authority has been, and will most likely be subject to further definition, either through additional CAA rulemaking, litigation, or a combination of both. Other environmental, and energy statutes have been, and may also be utilized to address GHGs, among them the National Environmental Protection Act, the Clean Water Act, various waste laws, and comprehensive energy legislation such as the Environmental Policy Act of 2005, the Energy Independence, and Security Act of 2007, and legislation to control hydrofluorocarbons contained in the Comprehensive Appropriations Act, 2021.

167 In addition, some provisions of the 1990 Amendments, such as section 812 which provided for the monitoring of carbon dioxide emissions from powerplants, were not incorporated into the CAA itself.

168 P. Law 110-161, Consolidated Appropriations Act, 2008 provided $3.5 million for promulgation of a rule "to require mandatory reporting of GHG emissions above appropriate thresholds in all sectors of the economy of the United States." Associated report language directed the Agency to utilize its existing authority under the CAA for the rulemaking.

169 Section 812 was approved as part of the 1990 Clean Air Act Amendments but was not codified as part of the Clean Air Act, 42 USC. §7401 et seq.

170 The Benefits, and Costs of the Clean Air Act, 1970 to 1990 at ES-8.

171 *Id.* at ES-9, Table ES-5.

172 The Benefits, and Costs of the Clean Air Act: 1990 to 2010; The Benefits, and Costs of the Clean Air Act from 1990 to 2020, Final Report, April 2011.

173 The central estimate indicated $12 trillion in monetized net benefits from 1990 to 2020. Final Report at 2 (Abstract).

174 Regulatory Impact Analysis are required and have been generated in connection with individual CAA rulemakings, but such analyses do not assess all possible alternatives.

175 We would note that EPA has estimated the "social cost of carbon" for purposes

176 *See* https://www.eia.gov/electricity/data/browser.

177 *See, e.g.,* EPA's Estimated 2017-2025 MY Lifetime Discounted Costs, Benefits, and Net Benefits Assuming the 3% Discount Rate SCC Value. 77 Fed. Reg. at 62,629 (Oct. 15, 2012).

178 Climate Change 2014 Synthesis Report,

179 Fourth National Climate Assessment, Volume II, Summary Findings.

180 *Id.*

181 Section 821 did not amend the CAA, nor was it codified as part of the CAA.

182 Cannon memo at 4.

183 *Id.* at 6.

184 EPA's Authority to Impose Mandatory Controls to Address Global Climate Changed under the Clean Air Act, Robert E. Fabricant, August 28, 2003.

185 *Id.* at 1460, citing 42 USC. §7602(g).

186 *Id*. at 1463.
187 For example, the Green Power Partnership for electricity from renewable sources, the GreenChill program to promote supermarket refrigeration technologies that lower emissions, and reduce GHGs, the Combined Heat, and Power Partnership, and other programs to voluntarily reduce methane emissions still exist.
188 *Mexichem-Fluor, Inc. v. EPA*, 866 F.3d 451, *Mexichem-Fluor v. EPA*, No. 17-1024 (D.C. Cir.).
189 80 Fed. Reg. 64,662 (Oct. 23, 2015).
190 84 Fed. Reg. 32,520 (July 8, 2019)
191 See *American Lung Association v. EPA*, No. 19-1140 (D.C. Cir. 2021).
192 80 Fed. Reg. 64,510 (Oct. 23, 2015).
193 EIA monthly energy review environment section: https://www.eia.gov/totalenergy/data/monthly/#environment
194 See 74 Fed. Reg. 56,260 (Oct. 30, 2009). These rules, and follow-on rules to cover additional sectors are contained in 40 C.F.R. Part 98.
195 See FY 2008 Consolidated Appropriations Act, 121 Stat. 1844, 2128 (2008).
196 EPA has proposed rules to implement the American Innovation, and Manufacturing Act of 2020, Consolidated Appropriations Act of 2021, Section 103. EPA has previously utilized authority contained within CAA section 612 to regulate HFCs in certain end uses, albeit some provisions of rules previously promulgated were vacated as a result of litigation in the D.C. Circuit.
197 For example, pursuant to CAA §202(C) standards applicable to heavy duty engines must apply for no less than 3 years and include 4 years of "lead time."
198 In some cases, EPA has disclaimed the authority to reduce air pollutants to zero levels. For example, EPA does not believe it has the authority to set a zero NAAQS, in part, because such a level would be practicably impossible to meet. "The CAA does not require the Administrator to establish a primary NAAQS at a zero-risk level or at background concentration levels." 73 Fed. Reg. at 66,966 (Nov. 12, 2009), *citing Lead Industries Association v. EPA*, 647 F. 2d at 1156 n.51.
199 "[T]he Administrator shall publish, simultaneously with the issuance of any such criteria, and information, proposed national primary, and secondary ambient air quality standards . . ." CAA §109(a)(2).
200 CAA §109(b)(1), (2).
201 *See* generally, CAA §110.
202 See, e.g., Revisiting the NAAQS Program for Regulating GHG Emissions under the Clean Air Act, Duke Nicholas Institute, January 2017 at 23.
203 Letter from Administrator Wheeler to Center for Biological Diversity, Institute for Policy Integrity, Good, and Water Watch, and the David Brower Center, January 19, 2021; Letter from Acting Administrator Nishida to Center for Biological Diversity, March 4, 2021.
204 Returning to Clean Air Act Fundamentals: A Renewed Call to Regulate GHGs Under the National Ambient Air Quality Standards (NAAQS) Program, Georgetown Envtl. Law Review 233 (2019), Howard R. Crystal, Kassie Siegel, Maya Golden-Krasner, and Claire Lakewood, Georgetown Envtl. Law Review 233 (2019) at 262-264
205 *Id*. 264-266
206 *Id.* 266-271.
207 Whitman v. American Trucking Assoc. Inc., 531 US 457 (2001)
208 "At least three major difficulties would be presented with respect to the issuance by EPA of a NAAQS for one or more GHGs: (1) The determination of what GHG concentration level is requisite to protect public health, and welfare; (2) the unique nature of GHGs as pollutants dispersed from sources throughout the world, and that have long atmospheric lifetimes;, and (3) GHG concentrations in the ambient air are virtually the same throughout the world meaning that they are not higher near major emissions sources than in isolated areas with no industry or major anthropogenic sources of GHG emissions. Whatever level EPA might eventually establish as an acceptable NAAQS for one or more GHGs, EPA's setting of such a level would immediately implicate further issues under the NAAQS regime, including the ability of States, and localities to meet such a standard. If the GHG NAAQS standard for one or more gases is set at a level below the current atmospheric concentration, the entire country would be in nonattainment." 73 Fed. Reg. at 44,367.
209 *Id*. §112(d)(6), (f).
210 Can and Should GHGs Be Regulated as HAPs Under Clean Air Act Sect. 112?, Mark Bond, Sabin Center for Climate Change Law, Columbia University, June 2015.
211 GHG Regulation Under the Clean Air Act, Structure, Effects, and Implications of a Knowable Pathway, Nathan Richardon, Art Fraas, Dallas Butraw, Resources for the Future, April 2010 at 23-4.
212 73 Fed. Reg. at 44,494.

213 See, e.g., *Combating Climate Change With Section 115 Of The Clean Air Act, Law, and Policy Rationales*, Michael Burger ed. (Edward Elgar Publishing, 2020) (online summary available at https://climate.law.columbia.edu/sites/default/files/content/Combatting%20Climate%20Change%20With%20Section%20115_Summary.2020_0.pdf).

214 *Id.* at Chapter 2: The Legislative History of Section 115, Philip Barnett (online version available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3578177).

215 *Id.* at Chapter 3: Substantive Reciprocity, Ann Carlson.

216 *Id.* at Chapter 11: The Section 115 SIP Call, Philip Barnett, and Alexandra Teitz (online version available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3578181), and Chapter 12: Implementing Section 115 Through the SIP Revision Process, Jared Snyder, and Jessica Wentz (online version available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3569898).

217 *Id.*

218 *Section 115 is not a viable climate policy option*, Niskanen Center, accessed at: niskanencenter.org. This posting also argued that courts could limit CAA 115 to situations where a NAAQS had been established. But see also later commentary: https://www.niskanencenter.org/coals-nightmare/ (arguing in a later blog post than the one cited that the Supreme Court would uphold EPA use of 115), and https://media.rff.org/archive/files/document/file/RFF-DP-16-41.pdf (noting that 115's promise makes it worth pursuing but with caution, characterizing the legal risk as "similar in magnitude to those associated with the Clean Power Plan.").

219 See The Elephant in the Room of the Elephant in the Mousehole? The Legal Risks (and Promise) of Climate Policy under §115 of the Clean Air Act, Nathan Richardson, Resources for the Future, citing Whitman v. Am. Trucking Ass'ns, 531 US 457, 486 (2001). See n. 196 *supra* regarding later commentary.

220 For example, the Supreme Court has interpreted the phrase "any air pollutant" as applying to GHGs in one case (*Massachusetts v. EPA*), and as excluding GHGs in another (*Utility Air Regulatory Group v. EPA*, 573 US 302 (2014)) so some have argued this means that the courts would have to determine which precedent to follow. Proponents assert that three factors should incline courts to follow *Massachusetts v. EPA*: (1) the virtually identical language used in §115; (2) the lack of any of the "catastrophic consequences" that the Court relied on in *Utility Air Resources Group* as justification for its holding; and (3) the unique legislative history of §115. *See* Summary: Combating Climate Change with Section 115 of the Clean Air Act, Institute for Policy Integrity at the New York University School of Law, Sabin Center for Climate Change Law at Columbia Law School, and Emmett Institute on Climate Change, and the Environment at UCLA School of Law, Section 5: The Meaning of "Any Air Pollutant," (online at https://climate.law.columbia.edu/sites/default/files/content/Combatting%20Climate%20Change%20With%20Section%20115_Summary.2020_0.pdf). A noted above in the text, courts would also have to determine whether using §115 to curb GHGs violates the "elephant in a mousehole" doctrine, which says Congress does not hide major policies in minor provisions, or whether §115, the Act's "international air pollution" provision, represents what the Supreme Court recently called a "watering hole – exactly the sort of place we would expect to find this elephant." Further, proponents note that Congress enacted §115 at a time (i.e., 1965) when all of its provisions were enabling, not highly prescriptive, in nature. The brevity, and open nature of the language is also highly consistent with the character of, and context for the authority – i.e., enabling the Executive to act in a manner consistent with the nation's diplomatic, and trade interests.

221 This would include CAA authority that existed prior to the enactment of CAA §615 in 1990. CAA §157(b) of the CAA was enacted in 1977, but subsequently displaced when Congress approved title VI as part of the 1990 Clean Air Act Amendments.

222 Petition for Rulemakings, and Call for Information under Section 115, Title VI, Section 111, and Title II of the Clean Air Act to Regulate GHG Emissions, Institute for Policy Integrity, February 19, 2013.

223 *Id.* at 17.

224 73 Fed. Reg. at 44,519.

225 Id.

226 *Id.* In the 2008 ANPRM, EPA also noted that CAA §612 provided authority to review alternatives to ozone depleting substances and approve substitutes. As noted above, EPA subsequently promulgated regulations under this authority to end certain uses of HFCs. The extent of EPA's authority under this Title VI provision is still an open question following D.C. Circuit litigation, but in any event, it would be limited to substitutes for ozone depleting substances, constraining its potential reach to address climate change.

227 GHG Regulation under the Clean Air Act at 15.

228 CAA §211(o)(1).
229 In the context of the GHG Reporting Rule, EPA was directed to include both upstream, and downstream GHG emissions "as appropriate." Joint Explanatory Statement, FY 2008 Consolidated Appropriations Act, Pub. L. 110-161 (2008).
230 Effect of battery manufacturing on electric vehicle life-cycle GHG emissions, International Council on Clean Transportation, February 2018.
231 There has also been a substantial debate with regard to EPA's legal authority to promulgate such systems under the different potential CAA authorities cited above.
232 For example, legislation to authorize a broad economy-wide approach to GHG emissions (the American Clean Energy, and Security Act) contained provisions allowing for both domestic, and international offsets, subject to a limit on the volume of each.
233 Share of coal-fired generation in total electricity generation, 2010-2019, iea.org.
234 See, e.g., *American Lung Association v. EPA*, No. 19-1140 (D.C. Cir. 2021).
235 Without recounting the full litigation history, final rules to regulate GHG emissions from existing fossil fuel-fired EGUs were promulgated in 2014 (Clean Power Plan), subsequently stayed by the Supreme Court, repealed, and the replaced by the Affordable Clean Energy rule, which rule was subsequently vacated by the D.C. Circuit. *See* further discussion in sec. 1.2, *infra*. Thus, at present, there are no CAA regulations defining specific limits for GHG emissions from existing EGUs, albeit standards remain in place for new units, and GHG emissions may be considered, on a case-by-case basis, during the PSD permitting process.
236 Subpart OOOO standards were finalized in 2016. 81 Fed. Reg. 35,824 (June 3, 2016). This rule was subsequently amended in 2020 to rescind volatile organic chemical provisions applicable in the transmission, and storage segment, and methane requirements for the production, and processing segments. Requirements may be subject to further change following a Senate vote to rescind the 2020 rule. S.J. Res. 14.
237 The petition additionally requested EPA to assist states with addressing GHGs under CAA §110.
238 "This document summarizes much of EPA's work and lays out concerns raised by other federal agencies during the review of this work. EPA is publishing this notice today because it is impossible to simultaneously address all the agencies' issues and respond to our legal obligations in a timely manner." 73 Fed. Reg. at 44,355.
239 March 4, 2021. Letters from Acting Administrator Jane Nishida to various petitioners.
240 We would note that one petition denied by EPA in January was sent to the Agency in 2009. This means that it was pending at the Agency through nearly three full Presidential terms without a response. Other petitions filed with EPA during 2007, and 2009. The 2008 ANPRM noted that there were seven petitions received in the months prior to publication. 73 Fed. Reg. at 44,396.
241 Massachusetts, cited supra; Utility Air Regulatory Group v. EPA, 573 US 302 (2014).
242 *Combating Climate Change With Section 115 Of The Clean Air Act, Law, and Policy Rationales*, Michael Burger ed. (Edward Elgar Publishing, 2020), Chapter 11: The Section 115 SIP Call, Philip Barnett, and Alexandra Teitz (online version available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3578181), and Chapter 12: Implementing Section 115 Through the SIP Revision Process, Jared Snyder, and Jessica Wentz (online version available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3569898).
243 CAA §115(b).
244 See e.g., Ozone depletion, and climate change: impacts on UV Radiation, R.L. McKenzie et al, NIH Library of Medicine, 2010, accessed at https://pubmed.ncbi.nlm.nih.gov/21253660; Ozone Depletion, ultraviolet radiation, climate change, and prospects for a sustainable future, P. Barnes et al., University of Wollongong, 2019.
245 *See, e.g.,* 73 Fed. Reg. at 44,411.
246 Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 34,840 (June 18, 2014); Federal Plan Requirements for GHG Emissions From Electric Generating Units Constructed On or Before January 8, 2015; Model Trading Rules; Amendments to Framework Regulations, 80 Fed. Reg. 64,966 (Oct. 23, 2015); Emission Guidelines for GHG Emissions From Existing Electric Utility Generating Units; Revisions to Emission Guideline Implementing Regulations; Revisions to New Source Review Program, 83 Fed. Reg. 44,746 (Aug. 31, 2018).
247 Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,662 (Oct. 23, 2015); Repeal of the Clean Power Plan; Emission Guidelines for GHG Emissions from Existing Electric Generating Units; Revisions to Emission Guidelines Implementing Regulations, 84 Fed. Reg. 32,520 (July 8, 2019).
248 American Lung Association v. EPA, No. 19-1140 (D.C. Cir., Jan. 19, 2021)
249 *See* https://www.eia.gov/environment/emissions/carbon.
250 *See* https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions.
251 Environmental Defense Fund v. EPA, D.C. Circuit, No. 19-1222.
252 *Massachusetts v. EPA*, 127 S.Ct. at 1462.

Acid Rain

Introduction

As referenced in other segments of this report, the 1970 CAA provided the EPA with multiple tools to address ambient air quality issues as well as major stationary sources and mobile sources. But the 1970 Act, like many enactments, was a product of its time, reflecting prevailing considerations when it was approved by Congress. In the early to mid-1980s, concerns grew over the effects of lake and stream acidification, particularly in the Northeast and forested areas of the Mid-Atlantic and Southeast. EPA research indicated that the national average pH level of rainfall in 1980 was 4.6, rather than the 5.6 level associated with normal rainfall.[253] The National Acid Precipitation Program (NAPAP) was formed and efforts to more comprehensively monitor surface water and soils began in earnest.[254] The net result of these efforts, along with multiple Congressional hearings during the 1980s and increased public attention to the issue, was Title IV of the CAA, enacted as part of the 1990 CAA Amendments and designed to greatly limit acidic deposition from air emissions that, in many cases, were generated hundreds of miles away.

Title IV was the product of a vigorous Congressional debate and legislative negotiation in order to bridge the gaps between different regions of the country. Notably, however, this intensive process provided the first explicit authority for the EPA to implement emission controls utilizing a "cap and trade" system. In doing so, Congress provided the EPA with explicit timetables and legislative instructions with regard to how the program was to be implemented. Specifically, defined allowances were allocated for new and existing EGUs. Phase 1 of the program identified individual EGUs and the specific number of SO_2 allowances that would be allocated to each.[255] Phase II of the program provided specific formulas for SO_2 allowance allocations as well as allowance "set-asides" for different groups of EGUs.[256] Limitations on the emissions of NO_x from affected units was varied in stringency according to different types of utility boilers,[257] and detailed provisions were provided regarding permits, compliance plans, and penalties for excess emissions.

Fundamental to the acid rain program was one long legislative paragraph describing the "nature of allowances."[258] In brief, an allowance was specified to mean an authorization to emit SO_2 in accordance with the provisions of Title IV. Thus, rather than authorizing the EPA to prohibit or limit emissions based on statutory criteria, the EPA was required to allocate an authorization to emit SO_2 from "covered sources" up to specific statutory caps that applied in 1995 and 2000. Equally important to this statutory scheme, was the ability of an allowance recipient to "receive, hold, and temporarily or permanently" transfer allowances.[259] This latter element was explicitly designed to promote the most cost-effective reductions in air pollution among sources addressed by the acid rain program.

Successes

Since 1995, the EPA has annually reported on the results of the acid rain program.[260] The very first report issued indicated 100% compliance and determined that actual emissions were 39 percent below the allowable emission level specified for Phase 1.[261] Reports in subsequent years echoed these results. A report in 2000 coinciding with the start of Phase 2, noted that SO_2 emissions were 11.20 million tons as compared with a 1980 level of 17.30 million tons.[262] By 2010, SO_2 emissions from affected sources had dropped to 5.722 million tons.[263]

By the mid-2000s, reductions achieved by the acid rain program began to be "supplemented" by interstate transport rules, promulgated pursuant to EPA authority in section 110 of the CAA. These rules, described elsewhere in this report, imposed state SO_2 and NO_x emission caps on approximately two-dozen states in the eastern half of the US. In addition, emission controls installed on coal-fired units in order to comply with MATS, as well as the shutdown of numerous coal-fired units prior to the implementation of MATS, also reduced SO_2 emissions as a "co-benefit."

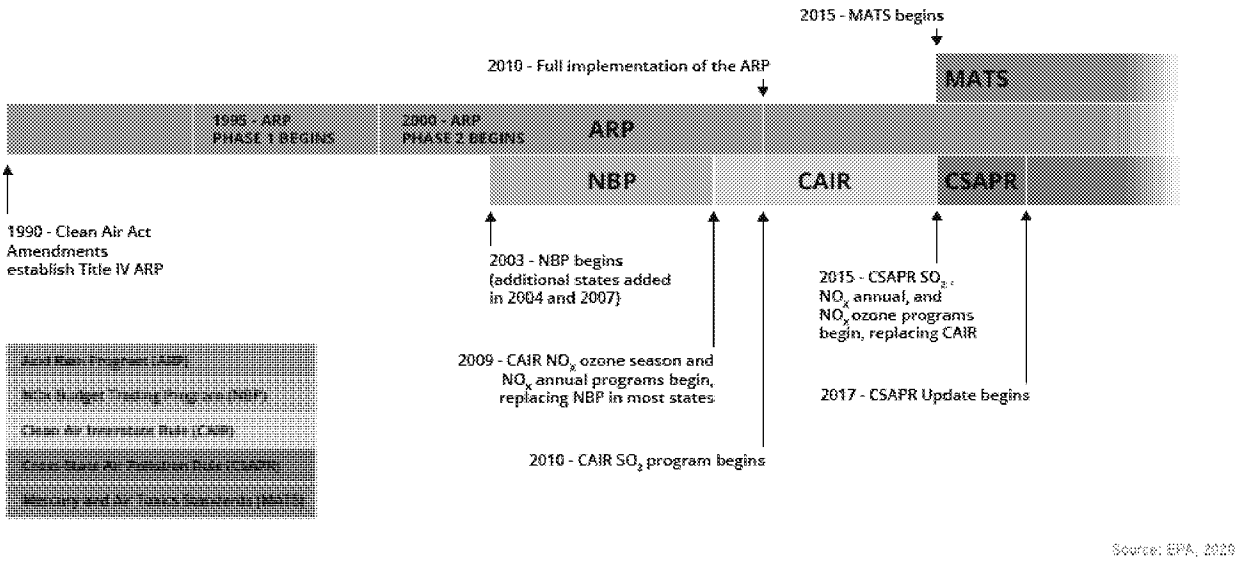


Figure 8. History of the ARP, NBP, CAIR, CSAPR, and MATS

As a result of these programs in combination with Title IV, covered units in 2019, emitted only 954,000 tons of SO_2 or approximately 10.6% of the allowable 8.95 million cap in SO_2 applied during Phase 2 of the program.[264] Compared with EGU SO_2 emission levels in the late 1970s to early 1980s, this represented an approximate 95% decline. The results are graphically represented below.

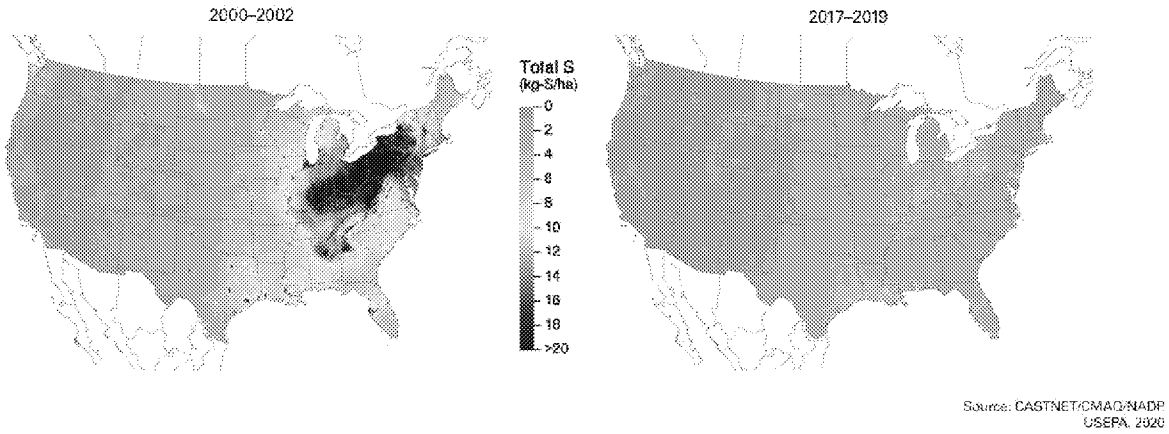


Figure 9. Three-Year Average of Total Sulfur Deposition

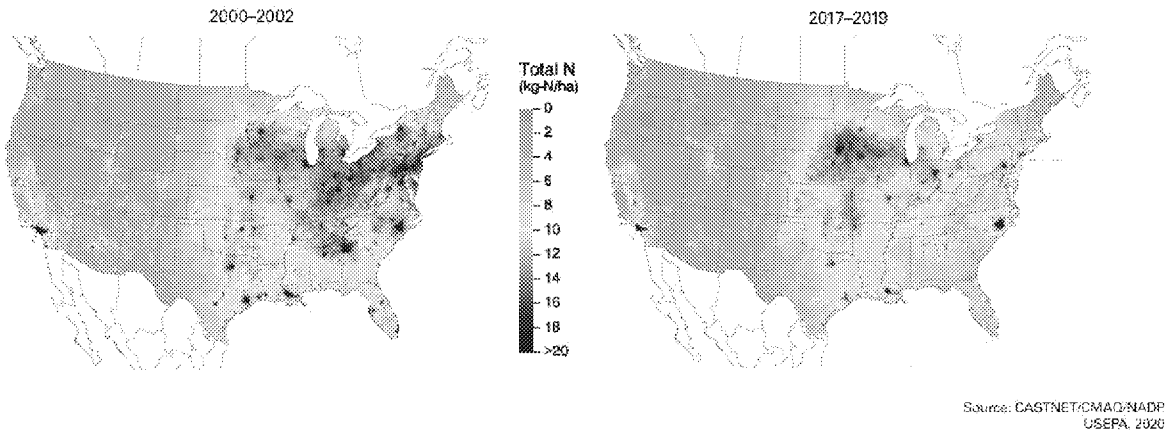
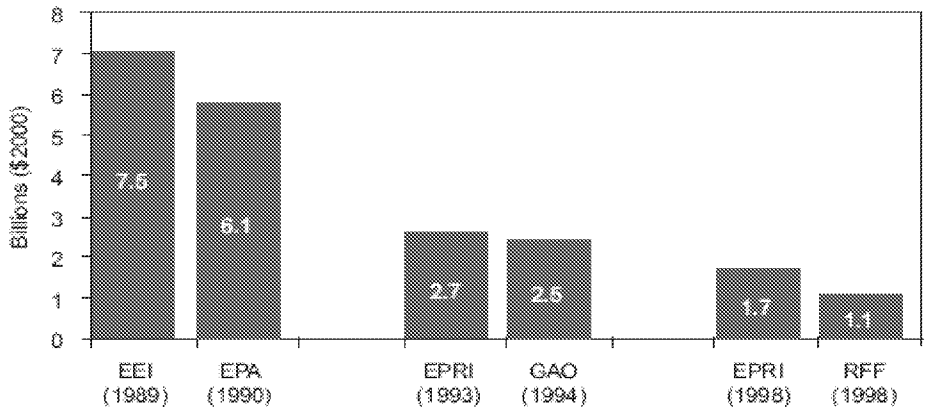


Figure 10. Three-Year Average of Total Nitrogen Deposition

Other air quality ecological system impacts are detailed in the EPA's most recent report on power sector programs.[265]

A notable success of the acid rain program was its overall policy, implementation, and economic efficiency. The program was implemented on time with demonstrable results. This may be attributable to several factors. First, as a result of the detailed legislative language contained in Title IV of the CAA, there was virtually no significant litigation involving implementation of the program. This itself is significant given that most major CAA rules have been subject to lengthy litigation in the US Court of Appeals (D.C. Circuit) and other courts. Second, there were limited enforcement actions initiated or required. The allowance-based trading program, literally run by a few EPA staff within the Clean Air Markets Division, relied on electronically reported data from sophisticated monitoring devices. Third, given the long timeframes specified and the certainty of emission reductions required, affected sources were able to plan compliance strategies well in advance, whether they involved the installation of pollution control equipment or the purchase of allowances. As a result, the entire cost of the program decreased substantially over time.[266]



Source: These estimates are adapted from NAPAP (2005, 13); "EEI": Edison Electric Institute; "GAO": U.S. General Accounting Office (now Government Accountability Office). The other abbreviations are defined in the text.

Figure 11. Evolution of Cost Estimates for Implementing Title IV Acid Rain Program, 2010

Opportunities and Future Challenges

From one perspective, the acid rain program could be considered to be a victim of its own success. While there was considerable concern at the time of enactment regarding the overall stringency and cost of the program, by around 2012, prices for SO_2 allowances decreased dramatically.[267] Thus, at a certain point in time, the existence of the program did not dictate additional behavioral responses, resulting in further reductions in EGU emissions. This perspective, however, fails to consider the impact of the program on initiating a broad-based downward trend in SO_2 and NO_x emissions from EGUs and in enabling the utilization of subsequent "cap and trade" programs used to address interstate air pollution. Installation of acid gas scrubbers and other emission control devices enabled further reductions at existing plants as well as demonstrated the effectiveness of this technology for other facilities.

As a consequence of this success, future opportunities for the acid rain program generally do not exist in developing additional measures to reduce SO_2 and NO_x emissions from EGUs as part of an expanded program under Title IV,[268] and, as noted above, these emissions are now primarily addressed through interstate transport programs and SIPs. But, there is the opportunity to more clearly discern what additional "lessons" can be learned from the program to aid in the development of future legislative and regulatory programs.

Recommendations

1. The Level of Precision in Title IV Should be Emulated in Implementing Other Parts of the CAA and with Regard to Framing Future Programs.

Title IV contains specific quantified levels of emission reductions (Phase 1 and Phase 2 emission caps), provides detailed instructions to the EPA with regard to how emission allowances should be allocated, and requires robust monitoring and reporting programs. These elements of the title both increased transparency and eased the compliance burden on the Agency and regulated entities. At a high level then, implementation of Title IV can be contrasted with other provisions of the CAA which have sometimes been mired in delay and uncertainty. For example, efforts to regulate GHG emissions from EGUs under Section 111 of the Act date back 10 years, with considerable questions remaining as to what may be considered a supportable "standard of performance." Specificity in emission requirements must certainly be backed up by technical and economic feasibility but can serve to ensure that overall emission goals are met. To the extent permissible, the EPA should strive to include such precision and clarity in the implementation of other CAA programs.

2. The EPA Should Establish a CAAAC Workgroup to Further Examine Relevant CAA Issues.

The CAAAC recognizes that it is charged with advising the EPA and not Congress. But it is also clear from our analysis that some provisions of the CAA have worked better than others. With respect to Title IV of the CAA, the precise drafting and reasonable timeframes for implementation allowed the EPA to fully implement the acid rain program with a minimum of delay and exceed the emission reductions required. Consistent with the overall perspectives expressed elsewhere in this report, the EPA should establish a workgroup to examine the "lessons learned" from the Title IV program and their relevance with respect to the implementation of other CAA programs and the extent to which adequate authority may or may not exist.

3. The EPA Should Support Science that Serves a Vital Role in Continued Progress Regarding Acid Deposition.

NAPAP, authorized prior to the enactment of Title IV, issued an interim assessment report regarding acidic deposition in 1987 and a follow-on report in 1990. In 2011, NAPAP completed an integrated assessment of the acid rain program. Thus, the mechanisms of acidification were studied both prior to implementation of the acid rain program and the results were reviewed afterwards by NAPAP, and periodic reports were issued by the EPA.

Since this this report was finalized, EPA scientific efforts related to acid rain have shifted to its reviews of secondary NAAQS for NO_X, SO_X from 2005-2012 and its current review of the secondary NAAQS for NO_X, SO_X, and PM initiated in 2013. Continued support of this science is important to enable continued progress in this area.

This preliminary and ongoing analysis of Title IV was key to structuring program elements and monitoring the progress achieved, as well as defining remaining challenges, *e.g.*, NO_x deposition. The EPA should consider this model of program development and assessment for other CAA regulations. While periodic assessments of the CAA have been completed for other programs, and while the EPA does, on its own initiative, examine program effectiveness, a more systematic approach may achieve better long-term results. In general, constructing explicit ties between the available science, and resulting policy goals and regulatory requirements as well as measuring quantifiable outcomes, is intrinsic to longer term success.

4. The EPA Should Further Assess What Elements of the Acid Rain Program Were Not Needed.

Title IV of the CAA provided for allowance "set asides," and an auction of allowances. Set asides were designed to compensate certain entities thought to be disadvantaged by general allowance formulas contained in the title. Allowance auctions were intended to provide for additional liquidity (apart from the ability to hold and trade allowances), and these auctions were originally administered by the Chicago Board of Trade and later by the EPA.

It would be instructive for the EPA to retroactively assess these elements of the acid rain program and their intended policy purposes and evaluate the extent to which such policy goals were achieved or not. This review would not be designed with regard to adjusting the acid rain program, but rather should have a prospective focus as to allowance allocation, set-aside, and auction programs that might be considered in the future.

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253 https://www.epa.gov/sciencematters/legacy-epas-acid-rain-research.
254 Pub.L. 96-294, Title VII.
255 42 USC. §7651c(e), Table A.
256 *Id*. §7651d.
257 *Id*. §7651f.
258 *Id*. §7651b(f).
259 *Id*.
260 Reports in later years also detailed implementation of other rules targeted at the same air pollutants implemented through interstate air pollution programs like the NO_x SIP Call, the Clean Air Implementation Rule, and the Cross-State Air Pollution Rule.
261 1995 Compliance Results, Acid Rain Program, July 1996.
262 Acid Rain Program: Annual Progress Report, 2000 at 5.
263 2010 Progress Report Emission, Compliance, and Market Analysis at 5.
264 Power Sector Programs Progress Report, 2019 at 22.
265 *Id*. at 70-99.
266 Chart from "*The SO2 Allowance-Trading System, and the Clean Air Act Amendments of 1990: Reflections on 20 Years of Policy Innovation*," National Tax Journal, June 2012, 65(2) at 425.
267 "By 2012, allowances cleared at auction prices less than $1 per ton, well below the $1,000 per ton allowance prices of the mid-2000s. The crash in the allowance prices reflected the overlapping of new regulations—initially the Clean Air Interstate Rule, followed by the Cross-State Air Pollution Rule—that cover the same pollutant, and emission sources as the SO_2 cap-and-trade program coupled with the absence of any discretion delegated to EPA under the CAA to adjust the SO_2 emissions cap." Looking Back at Fifty Years of the Clean Air Act, Resources for the Future, Report 20-01, October 2020 at 12.
268 Such a program would necessarily need to be legislated.

Stratospheric Ozone Protection

Introduction

Based on scientific studies by Drs. Sherwood Rowland and Mario Molina and other researchers during the 1970s, it was first theorized and then determined that chlorofluorocarbons (CFCs) used in refrigeration, aerosol sprays, and other uses could react with other gasses to destroy ozone in the stratosphere. Subsequent measurement of the earth's stratospheric ozone layer by the National Aeronautics and Space Administration confirmed that due to meteorological conditions, an ozone "hole" forms over Antarctica during the winter months, and the stratospheric ozone layer also declines at other latitudes, increasing ultraviolet radiation reaching the earth's surface. The stratospheric ozone layer serves to protect life on Earth from harmful ultraviolet radiation, which can result in a range of health effects, including skin cancer, eye damage, and immune system suppression.

The 1977 CAA Amendments contained several purposes and findings related to ozone protection, required a study of "all substances, practices, processes, and activities which may affect the stratosphere, especially ozone in the stratosphere,"[269] required a report to Congress, and indicated that the President should seek to negotiate international agreements aimed at developing standards and regulations.[270] The 1977 Amendments also conveyed authority for the EPA, upon certain findings, to promulgate regulations for the control of substances, practices, processes, or activities related to effects on the stratosphere.[271]

On March 14, 1988, the US Senate provided its advice and consent to the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol), and the US formally ratified the Montreal Protocol on April 5, 1988. Congress subsequently approved implementing legislation for the Montreal Protocol as part of the CAA in 1990. Title VI of the CAA provided for the phaseout of Class I ozone depleting substances (ODS) which consisted of CFCs, halons, carbon tetrachloride, and methyl chloroform in most cases by 2000 (these dates were later advanced by rulemaking). Substances with lesser ozone depletion potential (ODP), known as Class II substances, consisting of hydrochlorofluorocarbons (HCFCs) were scheduled for a later phaseout in 2015, except for certain identified uses. Other provisions provided for the phaseout of nonessential products containing ODS and for the approval of substitutes to replace Class I and Class II substances.[272] The interaction between the Montreal Protocol and the CAA was also made manifest in CAA section 614, which provided that Title VI was to be "construed, interpreted, and applied as a supplement to the terms and conditions of the Montreal Protocol [and in] the case of conflict . . . the more stringent provision shall govern."[273]

Successes

After enactment of Title VI, the EPA promulgated multiple rules to provide for the framework of phasing out ODS under the CAA (40 C.F.R. Part 82) and for implementing subsequent amendments to the Protocol ratified by the US,[274] as well as decisions of the Parties to the Montreal Protocol regarding allowable exemptions, and other matters.[275] Apart from the Montreal Protocol, the EPA also addressed requirements specified by Title VI, such as those applying to servicing of motor vehicle air conditioners and national recycling and emission reduction programs. The EPA also promulgated 23 rules and issued 36 notices of acceptability related to safe substitutes for ODS, which effectively allowed for an earlier transition from ODS to lower or non-ODS substances.

In 2007, the EPA issued a high-level report on the status of Title VI implementation. In general, the report indicated that statutory deadlines have been met, or compliance was achieved ahead of the statutory schedule. In addition, the report noted that phaseout of ODS has produced a substantial "co-benefit" in terms of GHG reductions, since many ODS also have high global warming potential values. These impacts in 2007 were measured at 8,900 $MMtCO_2e$, or as indicated in the report, the equivalent of reducing CO_2 by an amount equal to the emissions associated with total US residential electricity use over 13 years.[276]

Table 4. US Production of First-Generation Ozone-Depleting Substances Phased Out on Schedule

Chemical Group	Production Phase Out Dates	Deadline Met
Halons	January 1, 1994	✓
CFCs	January 1, 1996	✓
Carbon tetrachloride	January 1, 1996	✓
Hydrobromofluorocarbons	January 1, 1996	✓
Methyl chloroform	January 1, 1996	✓
Chlorobromomethane	August 18, 2003	✓
Methyl bromide	January 1, 2005	✓

Table 5. US Production of Second-Generation Ozone-Depleting Substances Phaseout on Schedule

Chemical Group	Production Phaseout Dates	Deadline Met
HCFCs	Cut production 35 percent by January 1, 2004	✓ (One year ahead of schedule)
	Cut production 65 percent by January 1, 2010 Cut production 90 percent by January 1, 2015 Cut production 99.5 percent by January 1, 2020 Complete phaseout by January 1, 2030	On track to meet all future requirements

It is also important to recognize that implementation of Title VI, in conjunction with the Montreal Protocol, has resulted in a substantial reduction in GHG emissions. For example, CFC-12, a chemical used in most refrigeration and vehicle air conditioning systems until the early 1990s, was subject to a 100% production and consumption phaseout in 1996. CFC-12 has a GWP of 10,900 and thus phaseout of this chemical in the US and other countries, in of itself, produced a significant reduction in GHG emissions. Similarly, HCFC-22, another commonly used refrigerant and propellant, is now almost completely phased out in the US (along with its GWP of 1,790). In 2019, it was estimated that as much as 1.1° Celsius in warming has been avoided over Arctic regions through implementation of the Montreal Protocol.[277]

It is also generally recognized that implementation of Title VI has been a major factor in moving international markets away from Class I and Class II substances and in promoting a transition to safer substitutes within the US and other countries. A recent 2018 international assessment[278] confirms this environmental progress:

Actions taken under the Montreal Protocol have led to decreases in the atmospheric abundance of controlled ODS and the start of the recovery of stratospheric ozone. The atmospheric abundances of both total tropospheric chlorine and total tropospheric bromine from long-lived ODS controlled under the Montreal Protocol have continued to decline since the 2014 Assessment. The weight of evidence suggests that the decline in ODS made a substantial contribution to the following observed ozone trends:

- The Antarctic ozone hole is recovering, while continuing to occur every year. As a result of the Montreal Protocol, much more severe ozone depletion in the polar regions has been avoided.
- Outside the polar regions, upper stratospheric ozone has increased by 1-3% per decade since 2000.
- No significant trend has been detected in global (60°S-60°N) total column ozone over the 1997-2016 period, with average values in the years since the last Assessment remaining roughly 2% below the 1964-1980 average.
- Ozone layer changes in the latter half of this century will be complex, with projected increases and decreases in different regions. Northern Hemisphere mid-latitude total column ozone is expected to return to 1980 abundances in the 2030s and Southern Hemisphere mid-latitude ozone to return around mid-century. The Antarctic ozone hole is expected to gradually close, with springtime total column ozone returning to 1980 values in the 2060s.

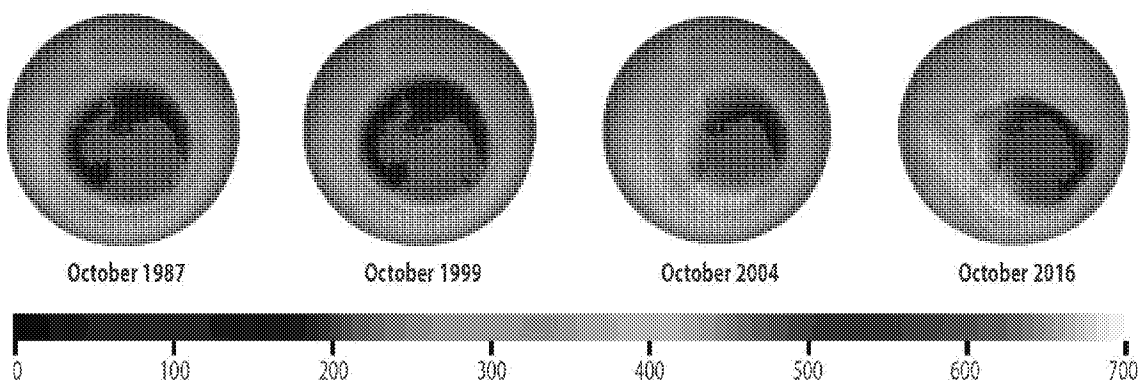

Figure 12. Total Ozone (Dobson Units)

Opportunities and Future Challenges

1. Implementation of Remaining Phaseout Schedules

While the EPA moved to end the use of CFCs, halons, and other major Class I ODS in the mid-1990s, a 100% phaseout level for all Class I substances was not fully implemented until 2005, when this phaseout level applied to methyl bromide.[279] Certain exempted uses for methyl bromide and other Class I substances remain (*e.g.*, laboratory and analytical uses[280]) but on the whole, the phaseout of Class I substances is largely complete. With regard to Class II substances, limitations on HCFCs began to apply in 2004; currently the US has implemented a 99.5% reduction in HCFC production and consumption relative to baseline levels. In 2030, no production or importation of HCFCs will be allowed. Since regulatory mechanisms, providing for production and consumption allowances are in place for the remaining periods of time, it would appear that there should be little issue with implementing the remaining phaseouts in the US.

This, however, does not mean that Title VI has been displaced by other CAA programs (such as the case with Title IV) or that there are no remaining challenges in securing continuing phaseout of ODS. Specifically, the Montreal Protocol imposes parallel but differentiated responsibilities. Developing "Article 5" countries generally have 10 additional years to comply with the phaseout requirements that apply in the US and other "Article 2" countries. Production of chemicals that may not be produced in the US can continue in other countries, albeit volumes are restricted on the basis of prior production and consumption baselines.

In past years, continued production activity and the international market for ODS has resulted in illegal imports into the US, with enforcement actions taken against a range of activities, including use of counterfeit trademarks on cannisters and importation of equipment containing ODS already phased out in the US.[281] As the US continues to transition away from ODS and move toward environmentally preferable substitutes, challenges may arise in terms of the need for continued enforcement and avoiding circumvention of Montreal Protocol requirements.

2. Implementation of SNAP Program

As noted above, the CAA provides authority for the Agency to approve substitutes for existing ODS. While litigation in the D.C. Circuit has affected implementation of the SNAP Program,[282] the Agency has continued to exercise its authority under CAA section 612 and to list new substitutes.[283] Since this program also provides that current substances may be found to be "unacceptable," and thus unable to be produced after a specified date, continued implementation of the SNAP program can aid in the transition away from both higher ODS and higher GWP substances.

3. Enforcement

The transition away from Class I and Class II ODS occurred not only in the US, but internationally, subject to different implementation timelines for countries classified as Article 5 "developing countries" under the Montreal Protocol. In addition, ODS may be shipped in both bulk containers and contained in products, meaning that enforcement of EPA Title VI regulations can take many forms. The EPA continues to take multiple enforcement actions each year, many of which result in settlement.[284] Compliance in other countries is subject to processes of the Montreal Protocol.

4. Addressing HFCs

HFCs were utilized as substitutes for Class I and Class II substances, either directly or in blends, due to their relatively low ODP. Recognizing that HFCs can have relatively high GWP values, in late 2020, following litigation in the D.C. Circuit affecting the EPA's available authority under the SNAP program,[285] Congress approved the American Innovation and Manufacturing Act (AIM Act) to provide authority for the EPA to phasedown HFC production and consumption in the US on a similar timeframe to the Kigali Amendment to the Montreal Protocol, which provides for the phasedown of HFCs under the Montreal Protocol.

The AIM Act, however, is not an amendment to the CAA, but stand-alone legislation, although its provisions parallel the structure of Title VI. The AIM Act requires the EPA to finalize implementing regulations by the fall of 2021.[286] The Kigali Amendment, at present not ratified by the US, is projected to reduce future climate change due to HFCs, with projected reductions in temperature from 0.2 to 0.4 Celsius.[287]

Recommendations

1. The EPA should Conduct a Formal "Lessons Learned" Exercise from Implementation of Title VI of the CAA Utilizing an Allowance-based System.

Unlike Title IV of the CAA, Title VI of the CAA does not contain detailed statutory language regarding allocation of emission allowances. CAA section 604 provides that the EPA is to promulgate regulations to phase out the production and consumption of Class I substances in accordance with the phaseout schedule contained in the section and other provisions of the title, subject to provided exceptions. Regulatory authority with regard to Class II substances is similarly phrased (CAA section 605(c)). CAA section 607 required rules for the issuance of allowances for production and consumption of Class I and Class II substances and for the transfer of allowances. Trading with other Parties to the Montreal Protocol was conditionally allowed in CAA section 616.

The EPA promulgated Class I and Class II regulations on the basis of an allowance system it developed under prior CAA authority it used to implement the 1987 Montreal Protocol.[288] In a 1991 proposed rule to implement new authority conveyed by the 1990 Amendments, the EPA cited but did not extensively discuss, its authorities under Title VI of the CAA for an allowance system, indeed noting that CAA section 604(a) limits on production were self-executing.[289] In the years after the first allowance regulations were promulgated pursuant to the 1990 CAA Amendment, the EPA has promulgated additional allowance allocations and rules to transition away from ODS.

After almost 30 years of regulatory effort, the EPA should comprehensively review how the phaseout of Class I and Class II substances was successfully managed, what could have been managed better, the extent of trading and transfer of allowances, the extent and effects of exemptions allowed, market-based systems that formed in response to EPA rules, the efficacy of public/private partnerships, and the extent to which effective substitutes were created in response to these systems. As noted above, the EPA has produced high level reports noting the progress and achievements of the stratospheric ozone protection program, but the CAAAC is unaware of more granular analyses of the Title VI regulatory system that led to such gains.

2. The EPA Should Define How Implementation of Title VI Programs Affecting HFCs Will Interact with Implementation of the AIM Act.

The EPA has approved various substitutes under the SNAP program, including substitutes that affect the use of HFCs. As noted above, the extent to which the EPA may utilize the SNAP program to address HFCs has been affected by litigation.[290] Passage of the AIM Act grants the EPA new authority to address HFCs, but the Agency has not indicated how authority under Title VI will either be affected, or not affected, by new authority in the AIM Act that is outside of the CAA. The EPA should clarify how it will administer two concurrent authorities, particularly with regard to how such authorities will be utilized or not utilized to address GHG emissions.

3. The EPA Should Articulate How Title VI Programs and Other CAA Authorities Addressing GHGs Interact.

Individual GHGs may have widely divergent impacts on stratospheric ozone. Some model simulations indicate both positive and negative effects. For example, increasing amounts of CO_2 result in lower temperatures throughout the stratosphere, "slowing down the rate of most destruction reactions."[291] Increases in methane lead "to changes in stratospheric chemistry that augment the increase in ozone driven by stratospheric cooling."[292] On the other hand, an increase in N_2O results in "significant decreases in global ozone due to chemical effects."[293] Past implementation of the Title VI is now recognized to have resulted in increases in HFCs with relatively high GWP; these gases are now the focus of reduction through the AIM Act. Given possible positive and negative effects, the EPA needs to examine how such findings could or should affect its implementation of Title VI, in conjunction with other CAA authorities. The EPA should review both near-term and longer-term objectives and how any positive and negative consequences can be managed under available authority.

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269 42 USC. §7453 (1977).
270 *Id.* §7456.
271 *Id.* §7457.
272 See generally 42 USC. §§7671i, 7671k.
273 *Id.* §7671m(b).
274 The London Amendment (June 1990); the Copenhagen Amendment (November 1992); the Montreal Amendment (September 1997); the Beijing Amendment (December 1999).
275 For example, exemptions allowing for the continued production of methyl bromide (used as an agricultural fumigant) or CFCs used in metered-dose inhalers for treatment of asthma, and other lung conditions were subject to a review process by technical committees of the Montreal Protocol, and subsequent decisions to approve specific quantities.
276 Achievements in Stratospheric Ozone Protection, Progress Report, April 2007.

277 Reduction in surface climate change achieved by the 1987 Montreal Protocol, R. Goyal, M. England, A. Gupta, and M. Jucker, Environmental Research Letters, Vol. 14, No. 12 (Dec. 2019).
278 Scientific Assessment of Ozone Depletion: 2018, World Meteorological Organization Global Ozone Research, and Monitoring Project – Report No. 58, January 2019.
279 42 USC. §7671c(h).
280 80 Fed. Reg. 3,885 (Jan. 26, 2015).
281 https://www.epa.gov/ozone-layer-protection/enforcement-actions-under-title-vi-clean-air-act#2020.
282 *Mexichem Fluor v. EPA*, 866 F.3d 451 (D.C. Cir. 2017), *Mexichem Fluor v. EPA*, No. 17-1024 (D.C. Cir. 2019).
283 *See, e.g.*, 86 Fed. Reg. 24,444 (May 6, 2021).
284 https://www.epa.gov/ozone-layer-protection/enforcement-actions-under-title-vi-clean-air-act#2020.
285 *See* nt. 13, *supra*.
286 86 Fed. Reg. 27, 150 (May 19, 2021).
287 https://www.fluorocarbons.org/environment/climate-change/kigali-amendment/
288 See 57 Fed. Reg. 33,765 (July 30, 1992). EPA also issued temporary regulations pursuant to CAA section 604 for 1991. 56 Fed. Reg. 9,518 (Mar. 6. 1991).
289 56 Fed. Reg. 49,552 (Sept. 30, 1991).
290 *See* nt. 13, *supra.*
291 Twenty Questions, and Answers About the Ozone Layer: 2018 Update, NOAA Chemical Sciences Laboratory at Q20.
292 *Id*.
293 *Id*.

Voluntary Programs

Introduction

While much of the CAA is focused on state and federal regulation of air pollution, voluntary programs and initiatives have been important in supporting the overarching goal of pollution prevention. There have been dozens of such programs over the past 50 years and cataloging all of these programs is beyond the scope of this report. However, the CAAAC wishes to highlight some of the programs we felt were especially noteworthy and identify some general challenges, opportunities, and recommendations related to voluntary air quality programs generally.

Successes

1. Small Business Compliance Assistance Programs

Section 507 of the 1990 CAA Amendments required each state to establish a Small Business Environmental Assistance Program (SBEAP) to help small business comply with the CAA. While large firms have the resources and expertise to hire professional staff and consultants dedicated solely to compliance with air quality regulations, small firms that may be subject to CAA regulations may lack the needed resources and expertise. The SBEAP provides a crucial avenue for small business to receive help from professional staff to achieve compliance with the applicable regulations, which has helped the public benefit from emission reductions implemented by small businesses and has helped the small businesses in ensuring that they do not find themselves out of compliance with rules and subject to enforcement from state or federal authorities.

2. Voluntary Programs to Attain the NAAQS

Since 1997, the EPA has issued a series of guidance documents that have encouraged the implementation of voluntary programs as part of SIP revisions for the attainment of the NAAQS. These programs have significantly expanded the opportunity for States, local governments and Tribes to incorporate these types of initiatives into their SIPs in lieu of more traditional point source emission controls on which NAAQS-related SIP revisions typically rely. These have included:

2.1. Guidance on Incorporating Voluntary Mobile Source Emission Reduction Programs in SIPs (1997): This guidance allowed up to 3% of required emission reductions needed to demonstrate attainment of NAAQS or reasonable further progress (RFP) in reducing emissions to be from voluntary mobile source programs, such as commuter programs, special event management, vehicle use limitations/restrictions, idling reduction, and small engine and recreational vehicle programs.

2.2. Improving Air Quality with Economic Incentives (2001): This guidance enabled California and Texas to incorporate programs to replace older, heavy-duty diesel vehicles and off-road equipment with newer, cleaner vehicles and equipment, thereby accelerating the benefits of EPA mobile source emissions standards, as well as state-level or local/regional credit-trading programs.

2.3. Incorporating Voluntary Stationary Source Emission Reduction Programs into SIPs (2001): Similar to the guidance on credits for voluntary mobile source programs, this guidance allows for up to 3% of required emission reductions for an attainment or RFP SIP to be met using voluntary stationary source emission reductions beyond what is required for meeting RACT, BACT, or LAER emission limits.

2.4. Guidance on SIP Credits for Emission Reductions from Electric Sector Energy Efficiency and Renewable Energy Measures (2004): This guidance document built on the 2001 *Incorporating Voluntary Stationary Source Emission Reduction Programs into SIPs* guidance document by identifying measures that could be incorporated into a SIP to meet attainment demonstration or RFP credit requirements. These included demand-side reductions, like replacement of older appliances with Energy Star appliances and enhancing energy efficiency in buildings through better insulation, etc., as well as supply-side strategies that could increase the efficiency of existing generating assets (such as combined heat and power) or building solar or wind power.

2.5. Incorporating Emerging and Voluntary Measures in a SIP (2004): This guidance provided for a mechanism for the EPA to grant "provisional" emission reduction credits for emerging measures (measures that do not have the same high degree of certainty for quantification purposes) and voluntary measures, which are not enforceable against a particular source. The EPA stated in this document, "In light of the increasing incremental cost associated with stationary source emission reductions and the difficulty of identifying additional stationary sources of emission reductions, the EPA believes that it needs to encourage innovative approaches to generating emission reductions." This quote highlights the value that such measures can provide to air quality planning efforts.

2.6. Guidance on Incorporating Bundled Measures in a SIP (2005): The EPA issued this guidance in 2005 to address situations in which states, Tribes, and local governments may have not included measures in a SIP due to uncertainties as to the exact impact from each individual measure, but which – in aggregate – are believed to be achieving significant emission reductions.

3. Voluntary Programs to Maintain Attainment with the NAAQS

These programs were designed by the EPA in order to help areas designated "attainment/maintenance" for the O_3 NAAQS and, more recently, the $PM_{2.5}$ NAAQS attain and/or maintain the NAAQS. Since the CAA is not very specific about the timing or requirements for designating an area as "nonattainment" following the initial round of area designations, one of the main reasons these programs were created was to provide a framework for bringing any area designated "attainment/unclassifiable" that were experiencing violations of the NAAQS into attainment as quickly as possible without needing to resort to a nonattainment designation. Aside from the air quality benefits of attaining and maintaining the NAAQS, avoiding a nonattainment designation for these areas also relieved the EPA, states, and local areas from the many regulatory burdens that are triggered by a nonattainment designation.

3.1. Flexible Attainment Region (FAR, 1995-2001): First developed in Tulsa, Oklahoma, the FAR program involved an agreement between local officials, states, and the EPA to develop and implement a SIP revision to bring areas into attainment of the 1979 O_3 NAAQS that had been violating it but had not yet been designated nonattainment.

3.2. One-Hour O_3 Flex Program (1-hr O_3 Flex: 2001-2002): This voluntary program did not involve SIP revisions but, rather, was designed to help ensure that areas that were measuring exceedances of the 1979 1-hour O_3 NAAQS were able to attain or maintain compliance with the NAAQS. This program included community-driven development of a voluntary air quality plan for the region. Five of the six areas participating in the program (Austin, Corpus Christi, Little Rock, Shreveport-Bossier City, Tulsa, and Quad Cities Metro Area) were located in EPA Region VI, which pioneered much of the structure of these voluntary planning efforts.

3.3. Early Action Compact (EAC, 2002-2004): The EAC program was rather unique among all of the EPA's voluntary air quality planning efforts since the 1990 CAA Amendments, in that it provided tangible regulatory relief in the form of a multi-year deferral of an area's designation for the 1997 8-hour O_3 NAAQS in 2004 in exchange for a SIP revision that would demonstrate attainment of the NAAQS by 2007 and continued maintenance of the NAAQS through 2015. The measures included in the SIP revisions could include a combination of voluntarily adopted regulatory measures, such as expanding the geographic coverage of state rules that apply to nonattainment areas to these "near-nonattainment areas," and voluntary measures such as expanded travel demand management and energy efficiency/renewable energy measures. This program resulted in SIP revisions for many areas across the country with measures that remain in place today. The program was a product of the unique circumstances around the 1997 8-Hour O_3 NAAQS, including extended litigation that went to the Supreme Court in 2001, and the EPA's proposal for implementing the NAAQS following the completion of the litigation. The specific regulatory relief provided by the program – a multi-year deferral of a nonattainment designation, has been determined by the courts to not be permissible under the CAA. However, the basic structure of the program – some degree of regulatory relief from a nonattainment designation in exchange for voluntary implementation of additional emission reduction measures – remains very appealing to local communities and states considering how to handle "near-nonattainment" situations.

3.4. 8-Hour O_3 Flex Program (8-hr O_3 Flex, 2006-2012): The 8-hr. O_3 Flex program provided a structure for continued voluntary O_3 planning in near-nonattainment areas. Key provisions included periodic reporting to the EPA on the status of the region's efforts and a promise by the EPA to ensure that SIP credit was assigned for any measures documented in the 8-Hr. O_3 Flex Program.

3.5. Advance Program (2012-current): The Ozone Advance Program was announced in 2012 as the EPA's replacement for the 8-hr O_3 Flex Program; it was designed to broaden participation. Under this program, states could sign up to cover all of their attainment/unclassifiable areas, and nonattainment areas classified as "Marginal" could participate as well, since there is no requirement for an actual attainment plan for such areas. The EPA added a PM Advance Program in 2013 and now refers to the overall program as simply the "Advance Program." While the EPA takes care not to make any commitment to provide any regulatory relief to areas participating in the Advance Program, it certainly provides a mitigating factor in favor of limiting the geographic extent of a potential initial nonattainment designation, deferring designations by a year, or – if a violation occurs after the initial designation, deferring a redesignation decision, incentivizing state/local agencies to take immediate steps to ensure continued NAAQS attainment. Currently, the EPA targets areas with O_3 design values of 65 ppb or higher (compared to the 70 ppb NAAQS), areas with annual $PM_{2.5}$ design values of 10 micrograms per cubic meter ($\mu g/m^3$) or higher (compared to the 12 $\mu g/m^3$ NAAQS), and areas with 24-hour $PM_{2.5}$ 30 $\mu g/m^3$ to recruit for participation, but the program is open to all areas that are not designated "nonattainment" for all three of these NAAQS.

4. DERA and National Clean Diesel Campaign

The DERA program was adopted by Congress as part of the Energy Policy Act of 2005, following successful implementation of heavy-duty diesel vehicle and equipment replacement/repower/retrofit programs in California and Texas. Congress first appropriated funds for the program in Fiscal Year 2008, and the American Recovery and Reinvestment Act of 2009 provided additional funding for the program that year. Congress re-authorized the program in 2010 and 2020 at $100 million per year. The program is up for re-authorization again in 2024. While the DERA statutory provisions reside outside of the CAA, they rely on EPA-certified engines and technologies, and DERA is administered by the EPA with the purpose of helping improve air quality. The EPA has incorporated other attributes of the CAA in the program design as well, such as giving priority to nonattainment areas, areas with a high degree of exposure to diesel PM, and areas participating in voluntary air quality programs designed to maintain compliance with the NAAQS.

5. Energy Star

ENERGY STAR is the government-backed symbol for energy efficiency, providing simple, credible, and unbiased information that consumers and businesses rely on to make well-informed decisions. Thousands of industrial, commercial, utility, state, and local organizations partner with the EPA to deliver cost-saving energy efficiency solutions that protect the climate while improving air quality and protecting public health. Since 1992, ENERGY STAR and its partners have helped American families and businesses save 5 trillion kilowatt-hours (kWh) of electricity, avoid more than $450 billion in energy costs, and achieve 4 billion metric tons of GHG reductions. Over the lifetime of the program, every dollar the EPA has spent on ENERGY STAR resulted in $350 in energy cost savings for American business and households. In 2019 alone, ENERGY STAR and its partners helped Americans save nearly 500 billion kWh of electricity and avoid $39 billion in energy costs.

6. SmartWay

The EPA's SmartWay program helps companies advance supply chain sustainability by measuring, benchmarking, and improving freight transportation efficiency. Launched in 2004, this voluntary public-private program:

- Provides a comprehensive and well-recognized system for tracking, documenting, and sharing information about fuel use and freight emissions across supply chains.
- Helps companies identify and select more efficient freight carriers, transport modes, equipment, and operational strategies to improve supply chain sustainability and lower costs from goods movement.
- Supports global energy security and offsets environmental risk for companies and countries.
- Reduces freight transportation-related emissions by accelerating the use of advanced fuel-saving technologies.
- Is supported by major transportation industry associations, environmental groups, state and local governments, international agencies, and the corporate community.

Opportunities

1. As the "low-hanging fruit" for reducing emissions from stationary sources through rulemaking and from mobile sources through emissions standards become less and less available moving forward, voluntary planning efforts may become an increasingly important tool for attaining and maintaining the O_3 and PM NAAQS, especially if they are tightened further in the future.
2. Thirty years of institutional experience under the 1990 CAA Amendments has enabled the EPA, states, and local governments to better understand the desirability of avoiding a nonattainment designation to begin with rather than fixing it after the fact, and that provides a powerful motivation to take further action.
3. EPA modeling indicates that all Class I areas are projected to see improvements in visibility this decade. These improvements are likely mostly driven by mobile source emissions standards, implementation of the O_3 and $PM_{2.5}$ NAAQS, NSPS, and NSR permitting, providing a good baseline of improvements that would be expected to occur even without additional BART rules.[294]

Future Challenges

1. Small businesses still face significant burdens in navigating the multitude of regulatory requirements in the CAA. These are in addition to the numerous other regulatory requirements they face over a wide range of issues.

2. Large numbers of areas initially designated as "Moderate" for O_3 limits the utility of SIP guidance on voluntary measures. Around 80% of areas that have been designated nonattainment for the 1997, 2008, and 2015 O_3 NAAQS are classified as "moderate," which means they do not require attainment plans. This means that these measures are not as useful for the vast majority of O_3 nonattainment areas. Furthermore, the limited time between a "Marginal" area failing to meet its attainment date and the due date for the attainment demonstration under its new classification means that there is not enough time to implement the voluntary measures.

3. There is a lack of certain and tangible regulatory relief for participation in voluntary programs. The current structure of voluntary attainment/maintenance programs does not provide tangible regulatory relief in exchange for the voluntary steps that the EPA is encouraging these areas to take. The lack of this type of relief may significantly diminish the amount of emission reductions that states and communities might otherwise be willing to take if they had firmer commitments from the EPA.

4. There is a lack of clarity on "out-of-cycle" designations. As discussed in the "NAAQS attainment and maintenance" section of this report, one issue that communities face is the lack of clarity about the circumstances in which the EPA might proceed with an "out-of-cycle" nonattainment designation, since such situations have been so rare to date. The lack of clarity on this point can sometimes result in a "boy crying wolf" effect when local air quality programs in near-nonattainment areas try to work with local stakeholders to participate in planning efforts – many may not believe that an "out-of-cycle" nonattainment designation is a very real possibility, which diminishes the likelihood of achieving implementation of additional measures early on.

5. Not all voluntary plans or programs are equally rigorous. One concern that has been raised on occasion about voluntary programs is that in some cases, agencies may only memorialize their existing measures rather than implementing new ones. For voluntary planning efforts that are rigorous, the wide degree of variation in the quality of participation across the country may inhibit the ability of some areas to receive more consideration for their own efforts in EPA decision-making related to area designations, among other issues.

6. Statutory provisions discourage early reductions: For some regulatory requirements that apply to nonattainment areas, such as NNSR and the 15% RFP requirement for VOC emissions, there are ways that current rules, guidance, and practice can inadvertently penalize such areas by creating stricter baselines for the areas from which percent reduction requirements would then be calculated if designated nonattainment in the future.

Recommendations

1. Transport SIP Credits for Voluntary Measures

The EPA should consider updating its guidance regarding SIP credits to enable voluntary measures to count towards any obligation a state may have to abate its downwind impact on another state. Since the emission reductions could come from anywhere within the state, this could provide a comprehensive mechanism for encouraging and tracking voluntary measures nationwide in all areas, regardless of designation.

2. Expand Opportunities for Attainment and RFP SIP Credits from Voluntary Measures

It has been a long time since the EPA has re-evaluated the guidance issued between 1996 and 2005 on voluntary measures, and a re-evaluation is due, particularly with an eye towards expanding the opportunities to encourage additional voluntary emission reductions. This may include items such as:

2.1. Increasing the maximum limit on creditability of voluntary measures

2.2. Adjusting emission baselines for NSR permitting and 15% RFP VOC requirements

2.3. Encouraging voluntary adoption of measures on a "contingency" basis that would be triggered by a nonattainment designation or a bump-up from Marginal to Moderate status. Since the EPA cannot require either of these, it could at least provide something like "pre-clearance," and approval of these on a contingency basis to enable the acceleration of emission reduction measure implementation in such areas.

3. Provide Tangible Benefits to Areas Voluntarily Reducing Emissions

While the specific benefit provided in the EAC program may not be able to be offered right now, there are many areas in which the EPA does have discretion to offer tangible benefits for voluntarily reducing emissions, especially if the EPA went through a formal notice and comment period for such a policy to ensure broader input and ensure a higher degree of legal durability for the policy.

3.1. 1-Year Postponements of Initial Designations: The EPA has the authority to postpone initial designations by up to 1 year beyond the default 2-year timeframe following a NAAQS designation, and it can offer this to areas that are just over the level of the NAAQS but are engaged in rigorous voluntary planning efforts with real emission reductions.

3.2. Initial Designation as Unclassifiable: The EPA has the authority to designate areas as "unclassifiable" rather than "attainment" or "unclassifiable." While there are no formal regulatory consequences for an "unclassifiable" designation, if an area is very close to the level of the NAAQS at the time initial designations are due and perhaps did not have data above the level of the NAAQS for all three of the years included in the averaging period, the EPA could use an "unclassifiable" designation for areas engaged in voluntary planning efforts, with the understanding that the situation will be reevaluated annually until the region's pollution levels are clearly going to remain in compliance with the NAAQS and could be redesignated to "nonattainment" if certain milestones are not met.

3.3. Issue Limited Protective Notices for Areas after Initial Designations: The EPA enjoys broad discretion regarding when and how to proceed with a redesignation to nonattainment after an area has initially been designated "attainment" or "unclassifiable" if it subsequently violates the NAAQS. The EPA could establish a policy stating that it would provide something like a "protective finding" that would offer areas participating in voluntary planning to avoid an "out of cycle" nonattainment designation for a defined period of time if they recorded a violation within that timeframe. This would more clearly establish parameters and benefits to "near-nonattainment" areas for participating in such programs, and it would provide leverage for them to seek additional emission reduction measures within their communities.

4. Continue to Support DERA, Energy Star, SmartWay, and Other Voluntary Programs

4.1. DERA: The EPA should continue to request the maximum funding authorized for DERA as part of its annual budget requests, should advise Congress on the amount of funding that would be required to fully replace older diesel vehicles and equipment over the next 5-10 years, and should consider program design enhancements that could take maximum advantage of some emissions sources and areas that would uniquely benefit from national-level funding, as opposed to state or local programs. These would include: 1) sources that routinely cross state lines, like long-haul trucks, locomotives, and ships; 2) Tribal areas; 3) port areas; and 4) smaller states with less capacity to establish or manage their own diesel replacement grant programs.

4.2. Energy Star, SmartWay and Other Voluntary Programs: The EPA should continue to support Energy Star, SmartWay, and other voluntary programs to improve air quality in order to achieve cleaner air more quickly and at lower cost than what may be possible through strictly regulatory programs. Where it would be useful, the EPA should consider new programs and should seek the CAAAC's input to help guide the design and implementation of these programs.

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294 https://www.epa.gov/sites/production/files/2019-10/documents/updated_2028_regional_haze_modeling-tsd-2019_0.pdf

Indoor Air

Introduction

Fifty years after adoption and successful implementation of air quality standards for the ambient environment, an important air quality challenge remains: the majority of human exposure to airborne pollutants occurs in the *indoor* environment. Standards for ambient air quality have existed since 1970 when Congress first established the CAA. 1970 was also the year that President Nixon signed the Occupational Safety and Health Act (OSHA), establishing indoor air quality standards to protect industrial worker health and safety. Through these statutes, the US utilizes health-based regulations to protect the public from a range of airborne pollutants, and they have done so while ensuring economic growth. The EPA has estimated that the CAA's benefits have outweighed its costs by a factor of thirty to one.[295] While for OSHA, there is measurable evidence that the standards have prevented injuries and illness, in turn ensuring a safe and viable workforce.[296] It should be noted that the success of both statutes is also linked to the agencies' deep commitment to *non-regulatory* measures, which include education, training, investment in technology, and voluntary partnerships.

Through the CAA and OSHA, the public is protected from hazardous levels of *outdoor* air pollution and industrial workers are protected from hazardous levels of *indoor* air pollution. However comprehensive public health standards for *indoor* air quality, in residences, schools, community buildings or commercial spaces, do not yet exist at the federal level. This gap in public health and safety is not negligible: indoor air generally contains more air pollutants than outdoor air,[297] and many of those pollutants occur at higher concentrations than outdoor air.[298] Activity patterns compound this exposure, as adults spend up to 87% of their time inside enclosed spaces and another 6% of their time in enclosed vehicles.[299] Certain segments of the population (*e.g.*, elderly, infants, chronically ill) are indoors on a near-continuous basis.

In the unregulated indoor environment, there is wide variability of pollutant species, sources, and chemical interactions. Inside most structures, the air is a mix of outdoor pollutants that have entered through infiltration or through natural and mechanical ventilation systems, coupled with pollutants emitted or generated from within the structure. This includes building materials and furnishings, human bioeffluents, a wide variety of occupant-generated pollutants from cooking, using consumer products, home improvement activities, conducting hygiene practices, smoking, etc. as well as pollutants that may be emitted from certain building materials, excess moisture, heating and cooling systems, and combustion gases from wood, natural gas, propane, oil, tobacco, and candles.[300] In addition, reactive chemical processes can also occur indoors, generating an additional source of pollutants.[301]

Through epidemiological, toxicological, and exposure science research, it is well-established that these indoor air pollutants produce significant (and often inequitable) economic[302], medical,[303] and public health costs[304] to society. Like the World Health Organization, EU countries recognize indoor air pollution as an important harm, and many have adopted indoor air quality standards and legislation. As with OSHA, EU and other countries address indoor air quality regulation through a blend of source controls, engineering controls, and administrative controls. This report recommends that the EPA build on the success of the CAA by developing a strategy exploring the viability of the federal government establishing national *indoor* air quality guidelines and/or standards.[305]

Recommendations

1. The EPA should consider a multi-pronged framework to guide their research and analysis. In Figure 13, recommended branches of research include: 1) Scientific and Technical Assessment, 2) Interdisciplinary Implementation Research and 3) Comprehensive Legal and Policy Analysis.

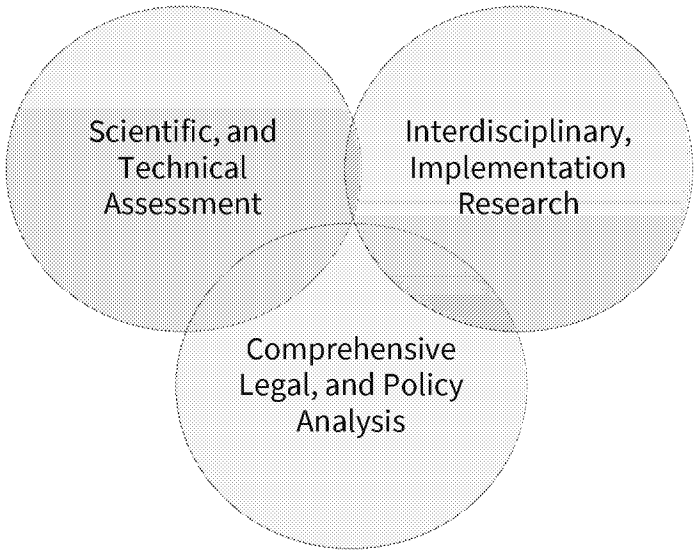

Figure 13. Proposed Framework for a Multidisciplinary Analysis of US Indoor Air Quality Standards

2. The EPA should study the extent to which high concentrations of criteria or hazardous air pollutions outdoors lead to increased concentrations of these pollutants indoors and assess whether existing integrated science assessments and risk assessments, respectively, do or do not account for indoor air pollution exposure that can be linked back to ambient air pollution levels. The EPA should also seek to understand the extent to which total exposure to criteria and HAPs occurs outdoors versus indoors and the respective source of each.

3. The EPA should evaluate those methodologies and quantitative standards used by other countries who have adopted reference values, air quality limits, and exposure guidelines. Many countries have established long-term and short-term exposure limits, screening values, or "Indoor Air Reference Levels" that can be regulatory, voluntary, or employed when conducting assessments.

4. The EPA should review and assess the impact and potential adaptation of other non-EPA federal regulatory measures on indoor air quality. For example, the Department of Energy is required to consider the impact of energy efficiency on habitability and on persons, and HUD is required to promulgate standards for the construction and safety of manufactured housing, including indoor air.

5. The EPA should perform a policy analysis of state and local "clean indoor air" laws (*e.g.*, ordinances that prohibit smoking in public spaces) to assess the results of such efforts, exploring the efficacy and impact of these laws, including issues related to enforcement and implementation.

6. The agency should consider approaches for coordinating current non-CAA EPA authority applicable to indoor environments, which are generally pollutant-specific (*e.g.*, lead, radon, asbestos) and scattered across a variety of statutes, including the Toxic Substances Control Act, the Federal Insecticide, Fungicide, and Rodenticide Act, the Comprehensive Environmental Response, Compensation, and Liability Act, and consumer product laws.

7. The agency should fund and participate in applied research with ventilation and building industries and other federal agencies (*e.g.*, the Centers for Disease Control and Prevention, the Department of Health and Human Services, and the Department of Housing and Urban Development) to review standards for ventilation in residential buildings (*e.g.*, the American Society of Heating, Refrigerating and Air-Conditioning Engineers Standard 62.1 and 62.2), with the aim of determining the type and concentration of indoor air pollutants and pathogens that can be removed through ventilation and filtration. Because the agency has limited research funding, it should seek to leverage its funding through research partnerships.

8. The agency should monitor emerging issues in indoor air chemistry, through collaboration with the research community, to address the interaction, sources, and sinks of ambient pollutants in the wide range of indoor environments and the impact of energy efficiency measures on building tightness, ventilation, and filtration.

9. The agency should monitor and communicate those indoor air risk factors at the intersection of climate and EJ, a product of housing with limited or inefficient ventilation, filtration, heating, and cooling systems. These risk factor include: 1) increase in time spent indoors, often in unfiltered or inadequately heated or cooled air, as people seek shelter during extreme heat or cold-weather events; 2) increased ambient temperatures and high heat events that will generate higher concentrations of ambient ozone, and which in turn infiltrate into indoor environments;[306] 3) higher concentrations and duration of exposure to PM and combustion gases from wildfires, with higher indoor concentrations in housing with inadequate ventilation and filtration;[307] and 4) higher risk of flooding that will contribute to microbial contamination of structures.

---

295 US EPA O. Benefits, and Costs of the Clean Air Act 1990-2020, the Second Prospective Study. US EPA. Published July 8, 2015. Accessed July 14, 2021.

296 Levine DI, Toffel MW, Johnson MS. Randomized government safety inspections reduce worker injuries with no detectable job loss. *Science.* 2012;336(6083):907-911.

297 Chen C, Zhao B. Review of relationship between indoor, and outdoor particles: I/O ratio, infiltration factor, and penetration factor. *Atmospheric Environment*. 2011;45(2):275-288.

298 Kelly FJ, Fussell JC. Improving indoor air quality, health, and performance within environments where people live, travel, learn, and work. *Atmospheric Environment.* 2019;200:90-109.

299 The National Human Activity Pattern Survey (NHAPS): a resource for assessing exposure to environmental pollutants | Journal of Exposure Science & Environmental Epidemiology. Accessed July 14, 2021.

300 Scheepers PTJ, Van Wel L, Beckmann G, Anzion RBM. Chemical Characterization of the Indoor Air Quality of a University Hospital: Penetration of Outdoor Air Pollutants. Int J Environ Res Public Health. 2017;14(5):497.

301 D. Abbatt JP, Wang C. The atmospheric chemistry of indoor environments. *Environmental Science: Processes & Impacts*. 2020;22(1):25-48.

302 Mudarri DH. National Expenditures, Jobs, and Economic Growth Associated with Indoor Air Quality in the United States. *Journal of Environmental Health*. 2014;76(9):26-31.

303 Burroughs HE, Hansen SJ. *Managing Indoor Air Quality, Third Edition*. CRC Press; 2004.

304Koivisto AJ, Kling KI, Hänninen O, et al. Source specific exposure, and risk assessment for indoor aerosols. *Sci Total Environ*. 2019;668:13-24.

305 The CAAAC is not taking a position on what authority may or may not be available within the CAA to address air pollution that may be experienced indoors, nor regulatory definitions that describe "ambient air." In addition, consistent with recommendation 3, any review undertaken should assess status of existing state, and local authority.

306 Salvador, C. M., Bekö, G., Weschler, C. J., Morrison, G., Breton, M. L., Hallquist, M., Ekberg, L., & Langer, S. (2019). Indoor ozone/human chemistry and ventilation strategies. *Indoor Air*, *29*(6), 913–925. https://doi.org/10.1111/ina.12594

307 Shrestha, P. M., Humphrey, J. L., Carlton, E. J., Adgate, J. L., Barton, K. E., Root, E. D., & Miller, S. L. (2019). Impact of Outdoor Air Pollution on Indoor Air Quality in Low-Income Homes during Wildfire Seasons. *International Journal of Environmental Research and Public Health*, *16*(19), 3535. https://doi.org/10.3390/ijerph16193535

Conclusion

The CAAAC was established to "…advise the EPA on issues related to implementing the CAA Amendments of 1990." Since its creation, the CAAAC has provided counsel to the EPA regarding major issues confronting the EPA's implementation of the CAA, and all members of the committee bring specific expertise and experience to the issues the EPA must address. This report was developed with participation as a hallmark and with the vast knowledge of the CAAAC utilized.

In developing this report, the CAA 50th Anniversary Report Work Group noted broad participation as a goal. This mirrors the intent of the CAA. Thus, the CAAAC was consulted through breakout sessions during a full committee meeting and further encouraged to submit comments on the draft report. What is abundantly clear from this process is that CAAAC members are problem solvers and want to share their vast knowledge and expertise with the goal of protecting and enhancing air quality and promoting the productive capacity of the population.

While the CAA has largely stood the test of time over its 50 plus years of existence, the committee noted several areas where the CAA is simply in need of updating in order to increase its effectiveness as well as address process and implementation issues. Due to the complexity and difficulty of legislation and the varying viewpoints on whether it is needed and its content, the recommendations in this report focus on the regulatory structure of the CAA and are primarily designed to be carried out under the current framework of the CAA. At the same time, however, the CAAAC encourages further discussion and perhaps the preparation of a future report centering on challenges that may require additional legislation.

Finally, a common element of this report is the lack of appropriate funding for the volume and complexity of work needed to carry out the CAA. While it is well understood that the EPA does not ultimately control funding for air quality work, the CAAAC encourages the EPA to explore additional ways to communicate to Congress about the benefits of well-funded air quality programs as well as the multiple agencies and partners who carry out such work and the resulting benefits that may be attributed to improved air quality. Further work is also needed in this area to further define the costs and benefits of air quality work and relative value of different approaches to implementing the CAA.

With this in mind, in addition to the many detailed recommendations included in this report, the CAAAC also recommends the following:

1. The EPA should communicate with Congress and the public regarding the human health, environmental, and economic impacts of air pollution, along with the benefits, costs, challenges, and opportunities presented by the CAA, as described in this report.
2. The EPA should make more extensive, regular, and timely use of the CAAAC when important issues regarding implementation of the CAA are in the pre-proposal or comment phase in order to obtain broad and informed stakeholder input.
3. The EPA should consider establishing a CAAAC workgroup to develop legislative options and recommendations for updates to the CAA that may be needed to address challenges and opportunities identified in this report.
4. The EPA should actively and timely engage the CAAAC on these recommendations.

List of Contributors

Authors and Workgroup Members

Shannon Broome	Hunton Andrews Kurth
Gail Good	Wisconsin Department of Natural Resources
Andrew Hoekzema	Capital Area Council of Governments
Gary Jones	PRINTING United Alliance Foundation
Robert Meyers	Crowell and Moring
Gillian Mittelstaedt	Tribal Healthy Homes Network
Clay Pope	Capitol Access Partners

CAAAC Members (at report completion)

Rosemary Ahtuangaruak	Arctic Futures Project
Susan Anenberg	George Washington University, Milken Institute, School of Public Health
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Mr. John Booher	Briggs and Stratton
Deborah Brown	American Lung Association
Natalene Cummings	Forest County Potawatomi Community, Natural Resources Department
Veronica Figueroa	Mosaic Fertilizer
Jeremy Fincher	Sac and Fox Nation
Daniel Greenbaum	Health Effects Institute
Ms. Sara Hayes	American Council for an Energy-Efficient Economy
Mitchell Hescox	Evangelical Environmental Network
Robert Hodanbosi	Ohio Environmental Protection Agency
Adrienne Hollis	Union of Concerned Scientists
Jason Howanitz	Jefferson County Department of Health
Timothy Hunt	American Forest and Paper Association & American Wood Council
Elizabeth Jacobs	Akwesasne Housing Authority

Miles Keogh	National Association of Clean Air Agencies (NACAA)
Kate Konschnik	Duke University, Nicholas Institute
Beto Lugo-Martinez	Clean Air Now
Eric Massey	APS
Daniel Nickey	University of Northern Iowa
Donald Peters	Community Against Pig Pollution and Disease
Mary Peveto	Neighbors for Clean Air
Frank Prager	Xcel Energy Inc.
Kris Ray	Confederated Tribes of the Colville Reservation
Maria Duaime Robinson	Massachusetts House of Representatives
Kimberly Scarborough	Public Service Electric & Gas
Max Sherman	Lawrence Berkeley National Laboratory
William Spratlin	Aptim Environment and Infrastructure
Ted Steichen	American Petroleum Institute
Vicki Sullivan	Duke Energy
T.J. Wallington	Ford Motor Company
Robert Wyman	National Climate Coalition

CAAAC Members (during report development but whose membership expired prior to report completion)

Nancy Kruger	National Association of Clean Air Agencies
Steven Marcus	Rutgers University
Vernon Morris	Howard University
Mary Uhl	Western States Air Resources Council

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November 22, 2021

Mr. Joseph Goffman
Principal Deputy Assistant Administrator
Performing Delegated Duties of Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Mail Code 6101A
Washington, D.C. 20460

Dear Mr. Goffman:

The American Public Power Association (APPA) and its member utilities support the leadership and coordination that your dedicated staff has shown to public power. We would appreciate the opportunity to meet with you in December or January 2021 to discuss our ongoing partnership and public power's environmental and climate-related priorities.

Joy Ditto, APPA's President & CEO, and several team members would like to discuss working with the agency as it plans to develop a framework for regulating the power sector and the implications for establishing greenhouse gas emission (GHG) regulations for existing fossil sources. APPA members are reducing their GHG emissions through various means, including increased use of renewable energy resources, the development of new nuclear power, the addition of distributed energy resources and storage, and the adoption of energy efficiency programs. We want to share some of our member's recent activities to reduce their emissions.

In addition, we would like to discuss EPA's other regulatory priorities under the Clean Air Act, including EPA's review of the National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units-Reconsideration of Supplemental Finding and Residual Risk and Technology Review and rulemakings to address air emissions transport.

APPA has a long history of working closely with EPA, and we look forward to meeting with you to discuss how we can further build on our relationship.

Sincerely,

Carolyn Slaughter

Director, Environmental Policy

Message

From: Garner, Dorothy [Garner.Dorothy@epa.gov]
Sent: 11/22/2021 9:07:43 PM
To: OAR Briefings [OAR_Briefings@epa.gov]
CC: Grundler, Christopher [grundler.christopher@epa.gov]; Kocchi, Suzanne [Kocchi.Suzanne@epa.gov]; Lau, Patrick [Lau.Patrick@epa.gov]; Graff, Michelle [graff.michelle@epa.gov]; Martinich, Jeremy [Martinich.Jeremy@epa.gov]; Kabanda, Thierry [Kabanda.Thierry@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Rakosnik, Delaney [rakosnik.delaney@epa.gov]
Subject: Slides for Tomorrow - 11/23 - 4PM Briefing
Attachments: OAR CC Adaptation Briefing for OAR Senior Management_11-23-21.pptx; OAR Priority Actions_CCAdaptImpPlan_11-23-2021.xlsx

Attached are the slides for the 'OAR Adaptation Implementation Plan' briefing with Joe tomorrow afternoon at 4pm. Also attached is a file we may refer to during the briefing.

Thanks,
Dorothy

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 11/22/2021 9:27:26 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Tuesday, November 23
Attachments: November Business Review Materials; RE: November Business Review Materials; 11-23-21 - Indoor Air Metrics and Sensors - Overview Briefing - AA - Goffman (005).pptx; FW: Draft for OAR - Draft Proposal: FIP Addressing Regional Ozone Transport for 2015 NAAQS; OAR CC Adaptation Briefing for OAR Senior Management_11-23-21.pptx; OAR Priority Actions_CCAdaptImpPlan_11-23-2021.xlsx

Additional materials: email containing draft preamble of ozone transport rule – review by 11/26

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Tuesday, November 23, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

November 2021

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	**23**	24	25	26	27
28	29	30				

Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

November 2021

Tue, Nov 23

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Comms weekly
	10:00 AM – 10:30 AM	Check-in -- OAR BIF/BBB planning
	10:30 AM – 10:45 AM	**Free**
	10:45 AM – 11:30 AM	OAR Senior Staff
	11:30 AM – 12:30 PM	Infrastructure Preparedness Planning
	12:30 PM – 1:00 PM	Lunch/Mgmt Time
	1:00 PM – 1:30 PM	Weekly Check-In with Joe

■	1:30 PM – 2:00 PM	OTAQ Weekly
■	2:00 PM – 2:30 PM	Overview of Indoor Air Metrics and Sensors Program (1 ppt)
■	2:30 PM – 3:00 PM	RFS/SRE Rollout Discussion
■	3:00 PM – 3:30 PM	Video-call: Infrastructure Discussion with Joe Goffman, OAR
■	3:00 PM – 4:00 PM	OAR Business Review (2 emails)
■	4:00 PM – 5:00 PM	OAR Adaptation Implementation Plan (1 ppt and 1 Excel file)
■	5:00 PM – 5:30 PM	Meeting with David Doniger re: Supreme Court Litigation
■	5:30 PM – 6:00 PM	General Discussion
□	**After 6:00 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Johnson, Antoinette [Johnson.Antoinette@epa.gov]
Sent: 11/23/2021 8:43:53 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
Subject: RE: CPAD Check-in Meeting for Mercury Salts

Good afternoon,

My apologies the invite was sent in error.

Regards,

Antoinette Johnson
US Environmental Protection Agency
Center for Public Health and Environmental Assessment (CPHEA)
1200 Pennsylvania Avenue, NW (8623R)
Washington, DC 20460
Tel: (202) 564-6739

-----Original Appointment-----
From: Goffman, Joseph <Goffman.Joseph@epa.gov>
Sent: Tuesday, November 23, 2021 3:35 PM
To: Johnson, Antoinette
Subject: Accepted: CPAD Check-in Meeting for Mercury Salts
When: Tuesday, December 21, 2021 4:00 PM-4:30 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Microsoft Teams Meeting

Message

From: Profeta, Timothy [Profeta.Timothy@epa.gov]
Sent: 11/23/2021 10:07:25 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Culligan, Kevin [Culligan.Kevin@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Birnbaum, Rona [Birnbaum.Rona@epa.gov]; Noonan, Jenny [Noonan.Jenny@epa.gov]; Ashley, Jackie [Ashley.Jackie@epa.gov]; LaCount, Melanie [LaCount.Melanie@epa.gov]; Haeuber, Richard [Haeuber.Richard@epa.gov]
Subject: Draft - Workplan for Air and Climate Power Sector Strategy
Attachments: Outreach-Air-Climate-Power-Sector-Strategy workplan draft v3.docx

Dear Joe and Tomas –

In anticipation of a possible meeting with the Administrator next week, we were advised to prepare a workplan document, as Joe suggested in our last call, that could be shared with him as early as tomorrow. As a result, we have prepared the attached workplan document for your review. Our hope would be to confirm your comfort with it, or an evolved version, in time for the potential deadline tomorrow.

Please let me know if this is less than clear,

Tim

Message

From: DeLuca, Isabel [DeLuca.Isabel@epa.gov]
Sent: 11/23/2021 11:27:22 PM
To: OAR Briefings [OAR_Briefings@epa.gov]
Subject: Draft talkers for 11/30 meeting with State AGs
Attachments: 11.30.1 State AGs.docx

Hi Joe and Tomás,
Attached are some draft talkers for next Tuesday's meeting with the State AGs. I believe these are still on the long side. You could cut the brief mention of the SAFE and HFC rules, some detail on the oil and gas rule, or some of the power sector section, as you see fit, in order to save more time for discussion.

I'm out of the office tomorrow but in on Friday and can help with any edits then, as needed.

I hope you have a happy Thanksgiving!

Isabel

Isabel DeLuca
Deputy Communications Director
Office of Air and Radiation, US EPA
Phone 202-343-9247

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 11/24/2021 5:15:33 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]
CC: Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]
Subject: FOR INFORMAL REVIEW (by 11/29): GHGRP Proposed Rule, without Subpart I
Attachments: GHGRP proposed rule index_11-3-21.docx; 2021 Data Quality Improvements Proposal_DRAFT_11-3-21.docx

Hi Joe and Ale,

Attached to this email are two word files related to the GHGRP proposed rule (without subpart I). Tomas's comments have been inserted into the file entitled. "2021 Data Quality Improvements Proposal_DRAFT_11-3-21".

As a reminder, the program would appreciate your comments by **Monday, November 29**.

Thanks
Dan

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

From: Lau, Patrick <Lau.Patrick@epa.gov>
Sent: Wednesday, November 24, 2021 12:07 PM
To: Hooper, Daniel <hooper.daniel@epa.gov>
Cc: Graff, Michelle <graff.michelle@epa.gov>; Campbell, Ann <Campbell.Ann@epa.gov>
Subject: FW: GHGRP Proposed Rule

Dan,

Here are two redacted files for Joe and Ale's review with Tomas's comments inserted. Let me know if you have any questions or if there's anything else I can do to help.

Hope you have a wonderful Thanksgiving!

Patrick

From: Bohman, Jennifer <Bohman.Jennifer@epa.gov>
Sent: Friday, November 5, 2021 6:47 PM
To: Lau, Patrick <Lau.Patrick@epa.gov>
Cc: Banks, Julius <Banks.Julius@epa.gov>; DeFigueiredo, Mark <DeFigueiredo.Mark@epa.gov>; Kocchi, Suzanne <Kocchi.Suzanne@epa.gov>; Gunning, Paul <Gunning.Paul@epa.gov>; Schmeltz, Rachel <Schmeltz.Rachel@epa.gov>
Subject: GHGRP Proposed Rule

Hi Patrick –

This email contains the following documents for the proposed rulemaking "Revisions and Confidentiality Determinations for Data Elements under the Greenhouse Gas Reporting Rule" (SAN 7230; RIN 2060-AU35):

- OD Cover Note
- Proposed Rule:
  - Complete Version File Name = SAN 7230 Proposed Rule – Full Version
  - Redacted Version File Name = 2021 Data Quality Improvements Proposal DRAFT 11-3-21
- Index for the Proposed Rule:
  - Complete Version File Name = SAN 7230 Index – Full Version
  - Redacted Version File Name = GHGRP proposed rule index 11-3-21
- ICR Supporting Statement
- ICR Supporting Statement - Attachment 2
- Assessment of Impacts Memo
- Assessment of Impacts Memo - Appendix B
- Action Memo
- Fact Sheet

In the redacted version of the preamble and the index, we have removed all discussion of Subpart I (Electronics Manufacturing). The final column of the redacted index includes a "live link" to the section in the preamble where each change is discussed. The live links are programmed into Share point versions of the documents, so you must be online in order for the links to work. If you are not online when reviewing the document, you can use the sidebar navigation panel within word to drill down to the section of interest in the preamble.

Let me know if you have questions on any of these documents.

Jen Bohman
US EPA Greenhouse Gas Reporting Program
202.343.9548

Message

From: Nunez, Alejandra [Nunez.Alejandra@epa.gov]
Sent: 11/27/2021 6:06:18 PM
To: Hooper, Daniel [hooper.daniel@epa.gov]; Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]
Subject: RE: FOR INFORMAL REVIEW (by 11/29): GHGRP Proposed Rule, without Subpart I
Attachments: 2021 Data Quality Improvements Proposal_DRAFT_11-3-21 an.docx

Thanks, Dan.

Per a discussion that Tomas and I had on Wednesday, I also reviewed the draft proposal. I used the version shared in this message. Please find additional edits in the attached. This is really well done. I appreciate the opportunity to review (as well as your questions, Tomas).

Ex. 5 Deliberative Process (DP)

Please also note that I redacted (in black) two very short bullets that pertain to semiconductors in this document. I quickly edited when I realized this and did not review this subsection.

Thanks.

From: Hooper, Daniel <hooper.daniel@epa.gov>
Sent: Wednesday, November 24, 2021 12:16 PM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>
Cc: Carbonell, Tomas <Carbonell.Tomas@epa.gov>; Campbell, Ann <Campbell.Ann@epa.gov>
Subject: FOR INFORMAL REVIEW (by 11/29): GHGRP Proposed Rule, without Subpart I

Hi Joe and Ale,

Attached to this email are two word files related to the GHGRP proposed rule (without subpart I). Tomas's comments have been inserted into the file entitled. "2021 Data Quality Improvements Proposal_DRAFT_11-3-21".

As a reminder, the program would appreciate your comments by **Monday, November 29**.

Thanks
Dan

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

From: Lau, Patrick <Lau.Patrick@epa.gov>
Sent: Wednesday, November 24, 2021 12:07 PM
To: Hooper, Daniel <hooper.daniel@epa.gov>

Cc: Graff, Michelle <graff.michelle@epa.gov>; Campbell, Ann <Campbell.Ann@epa.gov>
Subject: FW: GHGRP Proposed Rule

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To: Lau, Patrick <Lau.Patrick@epa.gov>
Cc: Banks, Julius <Banks.Julius@epa.gov>; DeFigueiredo, Mark <DeFigueiredo.Mark@epa.gov>; Kocchi, Suzanne <Kocchi.Suzanne@epa.gov>; Gunning, Paul <Gunning.Paul@epa.gov>; Schmeltz, Rachel <Schmeltz.Rachel@epa.gov>
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- OD Cover Note
- Proposed Rule:
  - Complete Version File Name = SAN 7230 Proposed Rule – Full Version
  - Redacted Version File Name = 2021 Data Quality Improvements Proposal DRAFT 11-3-21
- Index for the Proposed Rule:
  - Complete Version File Name = SAN 7230 Index – Full Version
  - Redacted Version File Name = GHGRP proposed rule index 11-3-21
- ICR Supporting Statement
- ICR Supporting Statement - Attachment 2
- Assessment of Impacts Memo
- Assessment of Impacts Memo - Appendix B
- Action Memo
- Fact Sheet

In the redacted version of the preamble and the index, we have removed all discussion of Subpart I (Electronics Manufacturing). The final column of the redacted index includes a "live link" to the section in the preamble where each change is discussed. The live links are programmed into Share point versions of the documents, so you must be online in order for the links to work. If you are not online when reviewing the document, you can use the sidebar navigation panel within word to drill down to the section of interest in the preamble.

Let me know if you have questions on any of these documents.

Jen Bohman
US EPA Greenhouse Gas Reporting Program
202.343.9548

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 11/29/2021 10:22:07 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Tuesday, November 30
Attachments: 11.30.1 State AGs.docx; Mayflower GC Scoping comments 20211124.docx; FW: Learning agenda-- OAR benefits item; Update_OAR and TSCA Interface_Goffman_Nov 30 2021_.docx; NewHAPInfrastructureEGBrief.OAR.11.30.2021 (002).docx

Additional materials: Learning Agenda email with attachment and information ((deadline for OAR updates to OCFO is Wednesday)

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Tuesday, November 30, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

November 2021

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	**30**				

Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

November 2021

Tue, Nov 30

Before 8:00 AM	**Free**
8:00 AM – 9:00 AM	Private
9:00 AM – 9:30 AM	Management Roundtable
9:30 AM – 10:15 AM	OAR Senior Staff
10:15 AM – 10:30 AM	**Free**
10:30 AM – 11:00 AM	Update on TSCA and CAA Interface (1 word doc)
11:00 AM – 11:30 AM	Video-call: Heavy-duty Vehicles
11:30 AM – 12:30 PM	Infrastructure Preparedness Planning
12:30 PM – 1:00 PM	Meet and Greet with Joseph Goffman, OAR & R4 RA Daniel Blackman
1:00 PM – 1:30 PM	Weekly Check-In with Joe

■	1:30 PM – 2:00 PM	OTAQ Weekly
■	2:00 PM – 3:00 PM	General Conformity Applicability to OCS Wind Farm Projects Follow Up (1 word doc)
■	3:00 PM – 4:00 PM	Regulatory Infrastructure for new HAP Additions (1 word doc)
■	4:00 PM – 4:30 PM	OAR/OCIR Bi-Weekly Check-in
■	4:30 PM – 5:30 PM	Meeting with States re: Section 111 rulemakings (1 word doc)
■	5:30 PM – 6:15 PM	General Discussion
□	**6:15 PM – 7:30 PM**	**Free**
■	7:30 PM – 8:00 PM	Video-call: General Discussion
□	**After 8:00 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Shoaff, John [Shoaff.John@epa.gov]
Sent: 11/30/2021 3:59:37 PM
To: Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Koerber, Mike [Koerber.Mike@epa.gov]; Dunham, Sarah [Dunham.Sarah@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Henning, Julie [henning.julie@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Kocchi, Suzanne [Kocchi.Suzanne@epa.gov]; Edwards, Jonathan [Edwards.Jonathan@epa.gov]; Cherepy, Andrea [Cherepy.Andrea@epa.gov]
CC: Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]; Shaw, Betsy [Shaw.Betsy@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]; Lubetsky, Jonathan [Lubetsky.Jonathan@epa.gov]; Saltman, Tamara [Saltman.Tamara@epa.gov]; Weinstock, Larry [Weinstock.Larry@epa.gov]; Reddick, Lorraine [Reddick.Lorraine@epa.gov]; Morgan, Ruthw [morgan.ruthw@epa.gov]
Subject: FW: Feedback on CAAAC 1) CAA Anniversary Report Recommendations 2) Future CAAAC Engagement Goals & Questions
Attachments: final-caaac-50th-anniversary-report-2.3.pdf; caa-50-wg-presentation-oct-2021-final.pdf; CAAAC CAA Anniversary Report Recommendations Clif Notes Compilation.docx; CAAAC plan_Nov2021_for ODs tc an rev2.docx

All,

Per mention at Senior Staff, a friendly reminder on this request for feedback on the CAAAC Anniversary Report recommendations and engagement plan **by this Friday to Tamara**. Thank you!

John

JOHN SHOAFF (HE/HIM/HIS) | DIRECTOR
OFFICE OF AIR POLICY & PROGRAM SUPPORT (OAPPS)
OFFICE OF AIR & RADIATION | U.S. EPA | WJC NORTH 5442-C
1200 PENNSYLVANIA AVE. NW | MC 6103A | WASHINGTON, D.C. | 20460 | USA
Shoaff.john@epa.gov | **1-202-564-0531 DIRECT | 1-202-257-1755 MOBILE**

From: Shoaff, John
Sent: Thursday, November 18, 2021 5:27 PM
To: Peter Tsirigotis (Tsirigotis.Peter@epa.gov) <Tsirigotis.Peter@epa.gov>; Mike Koerber (Koerber.Mike@epa.gov) <Koerber.Mike@epa.gov>; Dunham, Sarah (Dunham.Sarah@epa.gov) <Dunham.Sarah@epa.gov>; Benjamin Hengst <Hengst.Benjamin@epa.gov>; Henning, Julie <henning.julie@epa.gov>; Grundler, Christopher <grundler.christopher@epa.gov>; Kocchi, Suzanne <Kocchi.Suzanne@epa.gov>; Edwards, Jonathan <Edwards.Jonathan@epa.gov>; Cherepy, Andrea <Cherepy.Andrea@epa.gov>
Cc: Goffman, Joseph <Goffman.Joseph@epa.gov>; Carbonell, Tomas <Carbonell.Tomas@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>; Kim, Eunjung <Kim.Eun@epa.gov>; Shaw, Betsy <Shaw.Betsy@epa.gov>; Ann Campbell (Campbell.Ann@epa.gov) <Campbell.Ann@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>; Lubetsky, Jonathan <Lubetsky.Jonathan@epa.gov>; Saltman, Tamara <saltman.tamara@epa.gov>; Weinstock, Larry <Weinstock.Larry@epa.gov>; Lorraine Reddick (Reddick.Lorraine@epa.gov) <Reddick.Lorraine@epa.gov>; Ruthw Morgan (morgan.ruthw@epa.gov) <morgan.ruthw@epa.gov>
Subject: Feedback on CAAAC 1) CAA Anniversary Report Recommendations 2) Future CAAAC Engagement Goals & Questions

Dear all,

As we get ready for the **next CAAAC meeting on Dec. 15**, we've two things we would like your feedback on to Tamara Saltman by Friday, Dec. 3rd. Note that each may take some time, though hopefully not too much, so please plan accordingly.

First, as you may recall, the CAAAC recently finalized *"The 50th Anniversary of the Clean Air Act: Clean Air Act Advisory Committee Report to the EPA"* see attached pdf along with the corresponding ppt presentation and clif notes compilation of report recommendations. The report represents the thoughtful advice and experience of many different people who work at a variety of organizations and with widely varying expertise and perspectives. Together they have identified over 100 recommendations for EPA's consideration. We committed to considering these recommendations carefully and reporting back to CAAAC regularly to update them on progress or consult on implementation for any that we choose to implement and as an initial step, Joe committed to providing an update and feedback at our next meeting on those recommendations that might be the most accessible. **To prepare for that presentation/discussion, please review the attached report and recommendations related to your work to identify those recommendations that might be the most fruitful to signal to the CAAAC for our near term follow up.** If you're so inclined, and since you'll be reviewing program-specific recommendations already, **it would also help to do some binning and, on top of the initial ask with the most accessible near-term recommendations, also consider and provide some feedback on those recommendations that we think we've done or are embarking on already (also useful to signal to the CAAAC) and consider if there might also be other recommendations that we might be interested in taking on or following up further in the longer term.** Identifying recommendations of interest could take any number of approaches so please consider these and what might be preferred with what you identify, e.g.,:

Ex. 5 Deliberative Process (DP)

These offer a nice segue to our **second** ask which Tomas and Ale also signaled at a recent Air Issues meeting. That is,

Ex. 5 Deliberative Process (DP)

Responses on both are requested by Fri., Dec. 2 to Tamara. Thanks very much!

John

JOHN SHOAFF (HE/HIM/HIS) | DIRECTOR
OFFICE OF AIR POLICY & PROGRAM SUPPORT (OAPPS)
OFFICE OF AIR & RADIATION | U.S. EPA | WJC NORTH 5442-C
1200 PENNSYLVANIA AVE. NW | MC 6103A | WASHINGTON, D.C. | 20460 | USA
Shoaff.john@epa.gov | **1-202-564-0531 DIRECT | 1-202-257-1755 MOBILE**

Message

From: Lin, Walter [lin.walter@epa.gov]
Sent: 11/30/2021 10:17:36 PM
To: OAR Briefings [OAR_Briefings@epa.gov]
CC: Koerber, Mike [Koerber.Mike@epa.gov]; Mozingo, Kristal [Mozingo.Kristal@epa.gov]
Subject: Briefing Material - Pre-Early Guidance: Coke Ovens RTR Proposed Rules (Tier 2, SAN 8471)
Attachments: Pre-EG Coke-Ovens-OAR-12-1-2021.docx

Please see attached briefing material for:

Pre-Early Guidance: Coke Ovens RTR Proposed Rules (Tier 2, SAN 8471) – Wednesday, December 1st @ 10:00AM

Thanks,
Walter

Briefing Memo - Subject
Printed on MM/DD/YYYY

Filed: MM/DD/YYYY X:XX AM/PM (FOR SCHEDULING) (if updated note in italics and in green font).

Briefing memos limited to 5 pages, size 14 font, Times New Roman; additional information, if necessary, may be added to an appendix (please delete this from header).

1. BRIEFING MEMO

December 1, 2021

MEMORANDUM FOR THE ADMINISTRATOR

FROM: Joseph Goffman, OAR, 202-738-2971, [HYPERLINK "mailto:Goffman.joseph@epa.gov"]

SUBJECT: Outreach on Climate Rules for the Power Sector

DATE: December 7, 2021

TIME: 4 – 5 p.m.

I. REQUESTING OFFICE:

Office of Air and Radiation / Office of Air Quality Planning and Standards

II. TIMING

Ex. 5 Deliberative Process (DP)

Briefing Memo - Subject
Printed on MM/DD/YYYY

Filed: MM/DD/YYYY X:XX AM/PM (FOR SCHEDULING) (if updated note in italics and in green font).

Briefing memos limited to 5 pages, size 14 font, Times New Roman; additional information, if necessary, may be added to an appendix (please delete this from header).

III. PURPOSE

Ex. 5 Deliberative Process (DP)

Briefing Memo - Subject
Printed on MM/DD/YYYY

Filed: MM/DD/YYYY X:XX AM/PM (FOR SCHEDULING) (if updated note in italics and in green font).

Briefing memos limited to 5 pages, size 14 font, Times New Roman; additional information, if necessary, may be added to an appendix (please delete this from header).

Ex. 5 Deliberative Process (DP)

VI. REGULATORY SUMMARY (IF APPROPRIATE)

N/A

Briefing Memo - Subject
Printed on MM/DD/YYYY

Filed: MM/DD/YYYY X:XX AM/PM (FOR SCHEDULING) (if updated note in italics and in green font).

Briefing memos limited to 5 pages, size 14 font, Times New Roman; additional information, if necessary, may be added to an appendix (please delete this from header).

Ex. 5 Deliberative Process (DP)

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 12/3/2021 1:26:11 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]
CC: Kim, Eunjung [Kim.Eun@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]
Subject: For Your Review: DRAFT OAP OP Monthly Agenda
Attachments: OAR OP Monthly_120621.docx

Before sending this to OP for comment and additions, wanted to provide you the opportunity to review. Thank you.

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 11/30/2021 10:38:01 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Wednesday, December 1
Attachments: 2021 12 01 OAR Pre-Brief OS RFS Set Rule - Slides V2.0.pptx; 2021 12 01 OAR Pre-Brief OS RFS Set Rule - Briefing Memo.docx; TPs for OIRA Call; RE: Update: 2015O3T FIP Schedule Discussion w/OMB; Pre-EG Coke-Ovens-OAR-12-1-2021.docx

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Wednesday, December 1, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

December 2021

Wed, Dec 1

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Air Issues Meeting
	10:00 AM – 10:45 AM	Pre-Early Guidance: Coke Ovens RTR Proposed Rules (Tier 2, SAN 8471) (1 word doc)
	10:45 AM – 11:00 AM	**Free**
	11:00 AM – 11:30 AM	Weekly EPA/OIRA check-in (2 emails)
	11:30 AM – 12:00 PM	One-on-One with Ann Ferrio
	12:00 PM – 1:00 PM	Lunch & Management time
	1:00 PM – 1:30 PM	Meeting with Southern Company re: GHG Regulations for the Electric Utility Sector Under Clean Air Act Section 111 (OAQPS to send tomorrow morning)

■	1:30 PM – 2:00 PM	One-on-One with Chris Grundler
■	2:00 PM – 2:30 PM	One-on-One with Jon Edwards
■	2:30 PM – 3:00 PM	Video-call: Pre-Brief for Options Selection for the Renewable Fuels Standard (RFS) Set Rule (1 word doc, 1 ppt)
■	3:00 PM – 4:00 PM	NVFEL@50 event
□	**4:00 PM – 4:30 PM**	**Free**
□	**4:30 PM – 5:00 PM**	**Free**
■	5:00 PM – 5:45 PM	MEETING: Weekly CPO/EPA/DOT Vehicle Call
□	**After 5:45 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Shoaff, John [Shoaff.John@epa.gov]
Sent: 12/6/2021 5:51:38 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]; Shaw, Betsy [Shaw.Betsy@epa.gov]; Millett, John [Millett.John@epa.gov]; DeLuca, Isabel [DeLuca.Isabel@epa.gov]; Hockstad, Leif [Hockstad.Leif@epa.gov]; Ferland, Henry [Ferland.Henry@epa.gov]
Subject: Points/background for COP26 Sync, Tues. 12/7 @ 11 AM
Attachments: OAR COP26 Thanks and Debrief Points.docx; 2021 12 07 COP26 Sync - JN Remarks final.docx

Joe,

Attached are some points/background for you to draw from with COP26 remarks tomorrow. I included up top the tentative agenda for the discussion and will try to flag if this perhaps changes in the lead up to the mtg at 11:00. The points are mostly to help remind of the range of events and I attempted to underscore main areas where possible (and since you only have 10 mins). With thanks to John M., I also included your "thank you" note below in case it helps and would note that Ann and your leadership team also deserve kudos for a myriad of contributions and support here as well. Finally, also appended are Jane's planned remarks. She plans to cover the youth event since she moderated it though I did include a point for you to add as you like with your hand off to her. Thanks.

John

JOHN SHOAFF (HE/HIM/HIS) | DIRECTOR
OFFICE OF AIR POLICY & PROGRAM SUPPORT (OAPPS)
OFFICE OF AIR & RADIATION | U.S. EPA | WJC NORTH 5442-C
1200 PENNSYLVANIA AVE. NW | MC 6103A | WASHINGTON, D.C. | 20460 | USA
Shoaff.john@epa.gov | **1-202-564-0531 DIRECT | 1-202-257-1755 MOBILE**

From: Goffman, Joseph <Goffman.Joseph@epa.gov>
Sent: Thursday, November 18, 2021 7:45 PM
To: OAR-WIDE-EVERYONE <OARWIDEEVERYONE@epa.gov>
Subject: With Huge Thanks from COP26!

As you know, Administrator Regan led an EPA delegation to COP 26 last week. In my view, and I believe in the Administrator's, his participation was a resounding success. Thanks to his and the delegation's work on the ground the US "returned to the Paris Agreement" not only with words, but with the presentation of the concrete actions EPA – and in particular OAR – has taken to achieve reductions in greenhouse gas emissions. The Administrator's success in Glasgow would not have been possible without the numerous and critical contributions from OAR. The excellence of the work done by the various teams who helped to make the Administrator's trip and COP26 itself so successful was dazzlingly evident every moment we were there. Our OAPPS colleagues **John Shoaff, Leif Hockstad, and Henry Ferland** did a masterful job with overall preparation and in working with our equally skillful and dedicated colleagues in OITA. Here's the scorecard of the encouraging outcomes that resulted from everyone's outstanding hard work before and during the COP:

Negotiations Team
OAR's negotiations team, led by **Mausami Desai, Bill Irving, Chris Sherry**, worked tirelessly with the U.S. Department of State to apply their skill, expertise, and credibility in engaging with other countries to complete the Paris Agreement Rulebook. This caps off six years of work to set the rules for how countries can work together to achieve goals from their nationally determined contributions under the Paris Agreement, and to create transparent, detailed reporting structures for tracking progress towards meeting those goals. OAR's unique expertise was central to this effort, and staff

will continue to play an integral role in helping developing countries as they compile and report their greenhouse gas inventories.

Global Methane Pledge

The *Global Methane Pledge* is an historic initiative to reduce global methane emissions by 30% from 2020 levels by 2030. OAR staff, led by **Pamela Franklin and her Methane wranglers (along with Honorary Wrangler Tomas Carbonell), Denise Mulholland, Monica Shimamura, Tom Frankiewicz, Nick Elger, Volha Roshchanka, Andrew Meluch**, provided both technical and communications expertise to make the Pledge a success, and support Administrator Regan and Special Presidential Envoy for Climate (SPEC) Kerry at the formal launch event on November 2nd. By the end of the COP meetings, more than 105 countries signed on take the Pledge. With these new commitments, 9 of the top 20 methane emitters are now participating in the Pledge, representing about 30% of global methane emissions and 60% of the global economy.

National Climate Strategy

Our intrepid team of economists and scientists -- **Jim McFarland, Morgan Browning, Sara Ohrel, Shaun Ragnauth, Jared Creason, Eric Smith, Jefferson Cole, Jameel Alsalam, Joe Bryson, Beth Conlin, Elizabeth Dutrow, Mikhail Adamantiades, Jeremy Martinich, and Corinne Hartin** -- worked with DOE and USDA to conduct critical analyses that show how the United States can meet our Paris goals. They helped assemble the "2020 Policy Baseline" projection and a set of twelve scenarios using economy wide and sectoral models to show how the U.S. can meet our Paris goals.

HFC Illegal Trade Event

Our HFC team, especially **Nancy Akerman and Cindy Newberg**, supported Administrator Regan's leadership of the well-attended event "Securing the Climate Benefits of the Global HFC Phasedown: Preventing Illegal Trade in Hydrofluorocarbons (HFCs)" on November 9 (click the link to watch). In addition to Administrator Regan, the event included representatives from the governments of the European Union, Japan, and Canada, as well as an industry association, The Alliance for Responsible Atmospheric Policy, and an environmental non-governmental organization, the Environmental Investigation Agency sharing their experiences with HFC regulations and illegal trade and concluded with a panel discussion. Participants discussed regulatory mechanisms, including Japan's initiative on end-of-life HFC management, and innovative tools to strengthen compliance with new HFC national regulations and reduce illegal trade of HFCs.

Proposed Rules to Reduce Methane and Other Harmful Pollution from the Oil and Gas Industry

As you know, on his first day in office, the President directed EPA to review our regulations for the oil and natural gas industry, consider new requirements, and issue a proposal in less than a year. Just over nine months later, the President and Administrator Regan announced that proposal – a comprehensive set of requirements that would sharply reduce the potent greenhouse gas methane, and significantly cut emissions of air toxics and smog-forming volatile organic compounds. This important work – which is a cornerstone of this Administration's methane strategy – wouldn't be possible without our stellar oil and gas team, including **Jameel Alsalam, Sara Ayres, Jazmine Anthony Harris; Sarah Baker, Cindy Beeler, Dave Bielen, Amy Branning, Kathryn Caballero, Elizabeth Chan, Toni Colon, Lisa Conner, Jan Cortelyou-Lee, Jared Creason, Kate Crowley, Owen Daly, Alison Davis, Jason Dewees, Mark DeFigueiredo, Gregory Dowd, Josh Drukenbrod, Elizabeth Etchells, Greg Ferguson, Gerri Garwood, Amy Hambrick, Brandon Hawkins, Brian Heninger, Howard Hoffman, Stephanie Hogan, Amber Iglesias Scott Jordan, Robert Klepp, Alex MacPherson, Peter Maniloff, Karen Marsh, Marguerite McLamb, Derek Mills, Michael Moeller, Mark Morris, Dave Nash, Teresa (Tess) Petesch, Shaun Ragnauth, Marcus Sarofim, Ned Shappley, Heather Simon, Nathalie Simon, Matthew Spangler, Kat Stoddard, Nick Swanson, Natalie Topinka, Lisa Thompson, Elineth Torres, Rod Truesdell, Abi Vijayan, Jeff Vukovich, Suzie Waltzer, Melissa Weitz, Matt Witosky and Rhonda Wright.**

Cookstoves and Clean Household Energy Event

Organized by our experts on cookstoves and household energy, **John Mitchell and the ORIA team**, the "Advancing Clean Energy Access to Households for Climate and Health Equity" event on November 4th included Administrator Regan highlighting the Administration's whole-of-government approach to address the significant climate and public health impacts of household energy use and discuss U.S. Government actions to advance clean energy access to low-to-middle-income households to reduce energy poverty and improve climate and health equity. This event was cohosted with

USAID and included participants from the United Nations, Sustainable Energy for All, Clean Cooking Alliance, and the World Health Organization.

ZEVTC and Decarbonizing Transportation in Emerging Economies Event
On November 10th, Administrator Regan announced that he will be co-chairing the Zero Emissions Vehicle Transition Council (ZEVTC). This was the culmination of the efforts of **Jim Blubaugh** and his team, who helped organize the 4th ZEVTC ministerial meeting in Glasgow. From day one, President Biden has made clear that this Administration is committed to tackling the climate crisis. Recognizing the transportation sector is already in the middle of a massive transition, this moment of change can mean a cleaner future for us all.

Additionally, **Jim Blubaugh and his team** put together the "Decarbonizing Transportation in Emerging Economies" event on November 10th. This event, co-hosted with USAID and NREL and Administrator Regan, highlighted EPA's regulatory and non-regulatory strategies to reduce emissions from vehicles. Decarbonizing transportation is essential for achieving a net-zero future, but the process for implementation is not always clear and we recognize that we need a "whole of government" approach to decarbonize the transportation sector globally. The event culminated in a discussion amongst a panel of field-based transportation experts that I had the pleasure moderating on the successes and challenges for emerging economies along the way to transportation decarbonization.

Youth Climate and EJ Roundtable
OITA's Assistant Administrator Jane Nishida moderated a roundtable discussion, organized by OAR, OPEEE, OITA, and OP, on the key role youth are playing in addressing climate change and pursuing environmental justice. Everyone in the delegation's eyes teared up listening to the panel. It was inspiring – even, in my case, curmudgeon-melting. The roundtable amplified the voices of a new and diverse generation of environmental leaders and their work to advance environmental justice through responses to climate change and discussed how the US can best work with youth leaders to advance climate action and environmental justice.

The panelists included Nisreen Elsaim (Sudanese Youth Climate Activist and Chair of UN Youth Climate Council), Archana Soreng (Indian Climate Activist from India, Member of Kharia Tribe, Member of UN Youth Climate Council), Alexandria Villaseñor (Founder of Earth Uprising), Justin Onwenu (Member of Michigan EJ Advisory Council), Chúk Odenigbo (Founding Director of Future Ancestors Services Inc.), and Lasse Bjørn (Saami Council Project Manager and Board Member of Young Friends of the Earth Norway).

This Administration has made climate change a centerpiece of U.S. foreign policy. The U.S. has pushed discussions to rally all countries to raise their climate ambition. These efforts have yielded important progress, progress that could not have been achieved without the tireless efforts of those listed above or all the others who supported this work. As we move into the holiday season, a time for taking extra care to let people know they matter, I'm honored to be able to get a head start on showing my gratitude to you for all you have done and continue to do. OAR's work is not done; we will keep pressing ahead. We can't tackle the climate crisis without you.

Many thanks,
Joe Goffman

Joseph Goffman
Principal Deputy Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 12/6/2021 8:08:09 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
CC: Hooper, Daniel [hooper.daniel@epa.gov]
Subject: REVISED: Annotated OP/OAR Agenda for TODAY
Attachments: OAR OP Monthly_120621.final annotated.docx

Updated with new information Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/1/2021 11:08:26 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Thursday, December 2
Attachments: 12-2-21 - Indoor Air Science Program Overview - Briefing - OAR AA - Goffman.pptx; REVIEW - Administrator Materials for Power Plant Strategy Outreach; REVIEW - Administrator EtO Materials; OTAQ-related meetings tomorrow

Additional materials: Power plant strategy Administrator briefing (email) - Feedback needed by 9 am tomorrow (Thursday)

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Thursday, December 2, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Busy
Out of Office
Tentative
Working Elsewhere
Free
Outside of Working Hours

December 2021

Thu, Dec 2

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Comms weekly
	10:00 AM – 11:00 AM	Speaking Engagement: Energy Innovates: Methane—Tackling that 'Other' Gas (comms to send)
	11:00 AM – 11:30 AM	Indoor Air Science Overview Briefing (1 ppt)
	11:30 AM – 12:00 PM	Pre-Meet for External SJV Meeting with EarthJustice
	12:00 PM – 12:30 PM	Meeting with Philadelphia Building & Construction Trades Steam Fitters Local 420 re: RFS Topics (1 email; OTAQ related meetings tomorrow)
	12:30 PM – 1:00 PM	Gold Medal Nominations Discussion

■	1:00 PM – 1:30 PM	Scheduling Meeting
■	1:30 PM – 2:30 PM	Light-Duty Vehicle Check-in
■	2:30 PM – 3:00 PM	Meeting with Consumer.org re: LDV GHG Standards (same email as Philadelphia talking points)
■	3:00 PM – 3:30 PM	Prep for EtO Congressional Briefing (1 email)
■	3:30 PM – 4:00 PM	OAR Meet & Greet with Lisa Garcia Region 2
■	4:00 PM – 5:00 PM	BIL Administrator Travel Planning
□	**After 5:00 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 12/7/2021 5:19:13 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
Subject: Call with Dan
Attachments: 2021 11 03 Options Seletion Ozone Transport - Decision Memo.docx

Importance: High

Though I have no expectation that you could possibly get to all of this...here is what I raised during RT this morning for your call with Dan today.

Ex. 5 Deliberative Process (DP)

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: Lin, Walter [lin.walter@epa.gov]
Sent: 12/6/2021 9:53:11 PM
To: OAR Briefings [OAR_Briefings@epa.gov]
Subject: FW: Briefing Material - Pre-brief Administrator Visit to RTP
Attachments: Total_Air_Exposure_Ax briefing_120221.pptx

From: Lin, Walter
Sent: Monday, December 6, 2021 4:32 PM
To: Hooper, Daniel <hooper.daniel@epa.gov>
Cc: Koerber, Mike <Koerber.Mike@epa.gov>
Subject: Briefing Material - Pre-brief Administrator Visit to RTP

Hey Dan,

Please see briefing material for:

Pre-brief Administrator Visit to RTP – Tuesday, December 7th @ 2:00PM

There may be slight tweaks to the slide deck but we will point them out to Joe/Tomas during the pre-brief. The briefing memo and the final slide deck will be sent up by COB tomorrow.

Thanks,
Walter

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/7/2021 11:09:53 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Wednesday, December 8
Attachments: RE: Memo deadline today; power-plant-standards-letter-20210406.pdf; CAAAC background for Air Issues Wed. 12/8 @ 9:30; FW: AA briefing materials on SNAP Remand Rule; Administrator Visit Briefing Memo, Slide Deck, and Attendee list

Additional materials: Administrator RTP trip briefing memo and slides (email) – due to AO by 3 pm tomorrow (Wednesday)

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Wednesday, December 8, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Busy | Tentative | Free
Out of Office | Working Elsewhere | Outside of Working Hours

December 2021

Wed, Dec 8

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Air Issues Meeting (1 email)
	9:45 AM – 10:20 AM	Travel to Office
	10:20 AM – 10:45 AM	Arrive at AO Office/Travel to Hill
	10:45 AM – 11:15 AM	Remarks: Meeting with the House Ethylene Oxide Caucus (1 email)
	11:15 AM – 11:45 AM	Hold || Add'l Time for Meeting with the House Ethylene Oxide Caucus
	11:45 AM – 12:45 PM	Travel Time to Office & Home
	12:45 PM – 1:00 PM	**Free**

■	1:00 PM – 2:00 PM	GHG Roundtable (1 pdf; power plant standards letter)
■	2:00 PM – 3:00 PM	Significant New Alternatives Policy (SNAP) Remand Rule (1 email)
■	3:00 PM – 3:30 PM	Weekly EPA/OIRA check-in
■	3:30 PM – 4:30 PM	Bi-weekly Oil and Natural Gas (O&G) Sector Meeting
■	4:30 PM – 5:00 PM	MEETING: CPO/EPA Biweekly
■	4:30 PM – 5:30 PM	White House Labor Stakeholder Call
■	5:00 PM – 5:45 PM	MEETING: Weekly CPO/EPA/DOT Vehicle Call
▨	5:00 PM – 6:00 PM	Wyoming Regional Haze Mediation
□	**After 6:00 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

April 6, 2021

President Joseph R. Biden, Jr.
1600 Pennsylvania Ave., NW
Washington, DC 20500

Re: Vital Public Health and Climate Protections to Address the Nation's Power Plant Pollution

Dear President Biden:

On behalf of our millions of members, we thank you for your bold vision to combat climate change and your dedication, in the American Rescue Plan and the American Jobs Plan, to building back an economy that creates millions of well-paying jobs and that protects and builds opportunity in communities on the front lines of air pollution and climate change.

Coal- and gas-fired power plants are the country's largest industrial source of dangerous air pollution. Despite years of progress thanks to past clean air protections and the plummeting costs of clean energy, power plants still emitted more than 1.6 billion metric tons of carbon pollution in 2019, nearly one million tons of sulfur dioxide, and nearly 900,000 tons of nitrogen oxides. Three-quarters of coal-fired plants still lack modern air pollution controls 30 years after the Clean Air Act was last amended, and every year they also discharge more than a billion pounds of toxic chemicals and other pollutants into the nation's waterways and dump tens of millions of tons of coal ash into ponds and landfills that can leach into rivers and groundwater.

As a result, these power plants still cause tens of thousands of deaths and hundreds of thousands of illnesses each year, are the nation's largest stationary source of climate pollution, and cause massive damage to ecosystems and agriculture. The health harms, climate impacts, and other damages fall disproportionately on overburdened and disadvantaged communities. We strongly support your commitment to ensure environmental justice communities and leaders are thoroughly engaged—and heard—in shaping and designing our nation's pollution control priorities and policies.

We support your goal of achieving 100 percent clean electricity by 2035. We applaud your Day One executive order directing EPA to reverse the Trump administration's effort to undermine standards for mercury and other toxic air pollutants. We note the decision of the D.C. Circuit Court of Appeals the day before your inauguration throwing out the former administration's do-nothing standard for power plant carbon pollution, and giving EPA both a clear mandate and a clean slate to set new standards that protect public health and the environment. And we support your intention to announce a new national commitment under the Paris Agreement this month.

We urge you now to set a clear and aggressive schedule for EPA to adopt and implement ambitious multi-pollutant power sector protections to curb the full range of dangers power plants pose. EPA has urgent responsibilities under three of the nation's fundamental environmental laws—the Clean Air Act, the Clean Water Act, and the Resource Conservation and Recovery

Act—to address the serious public health and environmental threats from power plants. By carrying out EPA's responsibilities under current law in parallel with seeking new incentives, investments, and authority from Congress to limit pollution, your administration can protect all communities while creating millions of good jobs for workers across the country, including those in industries currently dependent on high-polluting fuels. It is critical to phase down power sector carbon emissions at least 80 percent below their 2005 peak levels by 2030, which will support your administration's 2035 target for 100 percent clean electricity. Cleaning up the power sector is also essential to a broader strategy of electrifying our vehicles, buildings, and industry, in order to reduce the health- and climate-harming pollution from those sectors.

A multi-pollutant power sector approach and schedule for action under our current laws should include at least the following key elements:

- Curbing toxic pollution: EPA must restore the "appropriate and necessary" finding and strengthen the current mercury and air toxics standards for power plants.

- Cleaning up deadly soot and smog: Every power plant must address its health-harming pollution. EPA must aggressively enforce existing ambient air quality standards for dangerous fine particles and ozone and should quickly update and strengthen those standards to reflect current science. The agency must strengthen the "good neighbor" and other implementation rules to protect millions of people afflicted by upwind pollution beyond their control, and must set state-of-the-art standards for smog-forming oxides of nitrogen from new gas plants. EPA must also require power plants to consistently use the control technologies they already have installed but frequently turn off or bypass, and the agency must close the illegal loopholes for pollution during startups, shutdowns, and malfunctions.

- Safeguarding our climate: Cutting climate pollution from the power sector is essential to addressing the climate crisis. EPA must adopt strong carbon pollution standards for existing coal and gas plants, and for new gas plants.

- Protecting our parks and visibility: EPA must protect the millions of visitors to our national parks and the local economies that depend on them by reinstating and strengthening pollution control requirements for power plants that pollute national parks and degrade vistas over vast areas of our beautiful country.

- Cutting toxic water pollution: EPA must close loopholes in the effluent limitations for coal-fired power plants and strengthen the standards based on state-of-the-art treatment technology.

- Curbing coal ash: EPA must restore and strengthen safeguards for disposal of coal ash, the toxic waste produced by coal-fired electric power generation.

These vital public health and climate protections should be implemented through a set of rulemakings proposed by the end of this year and promulgated in 2022.

We urge your administration to fully carry out its responsibilities under our air, water, and waste laws to protect all people in all parts of our nation from the dangerous pollution from coal and gas plants. It is critical that these actions guarantee meaningful public health, climate, and environmental protections through quantifiable and enforceable pollution reductions.

In parallel with enforcing robust limits on power sector pollution, the administration should also seek new authority and investments from Congress to equitably curb the multiple dangers posed by fossil fuel-fired power plants and ensure that disadvantaged communities experience the benefits of the transformation to a clean energy economy. We enthusiastically support the commitments to environmental justice made in your Executive Order on Tackling the Climate Crisis at Home and Abroad and the American Jobs Plan, and urge the administration to engage directly with frontline communities to advance programs to address cumulative pollution impacts and to direct clean energy and energy efficiency investments to the communities where they are needed most.

Thank you for your leadership in rebuilding the economy, creating good jobs, protecting people's health, and reducing the ravages of the climate crisis. We are excited to work with you on all these initiatives to achieve our shared goals of meeting the demands of science while creating a stronger and more equitable future for us all.

Sincerely,

Mitchell S. Bernard
President & Chief Counsel
Natural Resources Defense Council

Dominique Browning
Director and Co-Founder
Moms Clean Air Force

Michael Brune
Executive Director
Sierra Club

Abigail Dillen
President
Earthjustice

Gene Karpinski
President
League of Conservation Voters

Fred Krupp
President
Environmental Defense Fund

Jamal Raad
Executive Director
Evergreen Action

Kathleen Rest
Executive Director & Interim President
Union of Concerned Scientists

CC: Gina McCarthy
National Climate Advisor

Michael Regan
Administrator, U.S. Environmental Protection Agency

Message

From: Nunez, Alejandra [Nunez.Alejandra@epa.gov]
Sent: 12/8/2021 3:44:27 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
CC: Hooper, Daniel [hooper.daniel@epa.gov]
Subject: RE: Reg Actions

Yes, happy to help.

From: Goffman, Joseph <Goffman.Joseph@epa.gov>
Sent: Wednesday, December 8, 2021 8:51 AM
To: Carbonell, Tomas <Carbonell.Tomas@epa.gov>; Campbell, Ann <Campbell.Ann@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>; Kim, Eunjung <Kim.Eun@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: RE: Reg Actions

You and I should definitely be reading it in parallel; Ale if she has time. Thanks.

Joseph Goffman
Principal Deputy Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

From: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Sent: Wednesday, December 8, 2021 8:49 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>; Goffman, Joseph <Goffman.Joseph@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>; Kim, Eunjung <Kim.Eun@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: RE: Reg Actions

Joe, I haven't had a chance to open it yet but I wonder if you and Ale (or at least Ale and I) should be reviewing the

Ex. 5 Deliberative Process (DP)

his is obviously a key cross-cutting proposal and although we've had a chance to be briefed and weigh in on the top-line decisions, this is our first opportunity to review the preamble itself and I think it's likely we will all spot issues and have comments. Best,

Tomás

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Wednesday, December 8, 2021 8:39 AM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>; Carbonell, Tomas <Carbonell.Tomas@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>; Kim, Eunjung <Kim.Eun@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: Reg Actions

Rather than take up time on RT, I pulled together the information below to make you all aware of what packages are in the IO (first section) and what I hope is a complete list of what's to come (note these is duplication between the lists). I

Ex. 5 Deliberative Process (DP)

It was my hope to avoid this kind of situation and I will be speaking to the reg managers in the next day or so to better understand the how of this and where we can improve. Better planning is needed as this almost seems unworkable.

Ex. 5 Deliberative Process (DP)

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 12/8/2021 6:41:44 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]
Subject: TPs for 3p OIRA Call

Ex. 5 Deliberative Process (DP)

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: Shoaff, John [Shoaff.John@epa.gov]
Sent: 12/8/2021 8:04:03 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Dunham, Sarah [Dunham.Sarah@epa.gov]; Edwards, Jonathan [Edwards.Jonathan@epa.gov]; Koerber, Mike [Koerber.Mike@epa.gov]; Kocchi, Suzanne [Kocchi.Suzanne@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Burch, Julia [Burch.Julia@epa.gov]; Cherepy, Andrea [Cherepy.Andrea@epa.gov]; Millett, John [Millett.John@epa.gov]; DeLuca, Isabel [DeLuca.Isabel@epa.gov]
CC: Shaw, Betsy [Shaw.Betsy@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]; Lubetsky, Jonathan [Lubetsky.Jonathan@epa.gov]; Saltman, Tamara [Saltman.Tamara@epa.gov]; Reddick, Lorraine [Reddick.Lorraine@epa.gov]; Morgan, Ruthw [morgan.ruthw@epa.gov]
Subject: RE: CAAAC background for Air Issues Wed. 12/8 @ 9:30
Attachments: CAAAC Engagement Dec 2021.docx

All,

Thanks for the discussion this AM and opportunity to sync on how we approach the upcoming discussion with the CAAAC. Have expanded our group a bit to help with follow up as may be needed. In that vein, would ask the programs to **please pass Tamara by COB Friday the following**:

1. **Your program designee/participant for the session** (It's circa 1:00-2:00 on Wed. 12/15 and, thanks to Ann, there's a hold on your (OD) calendars for then. We'll update this with a meeting link and upon feedback of your designees];

2. **Planned highlights** (no more than 5 min.s each) of recommendations in the two agreed categories, i.e., those that look like good ideas that we're considering/pursuing and those that we may already be doing in one way or another, to touch upon with the presentation/discussion [note you can pull from your contributions in the attached or what you also relayed Tamara previously]; and

3. **Any add'l feedback on ideas/options to reinvigorate our engagement with the CAAAC** [see last section in the attached].

We'll compile into a script for the session on Wed. and aim to get you asap, either COB Mon or on Tues.

To recap, we'll work with Isabel on a brief update from Joe to start the session along with some introductory contextual remarks to hand off to programs on our initial response to recommendations. Following that, we'll transition back to Joe or Tomas/Ale to conclude the session with some thoughts on near term topics we might engage the CAAAC on, e.g., with our next mtg Feb. 7-8, including ideas/options for how we might reinvigorate our engagement.

If you'd like to discuss further, please let Tamara or I know. Thank you!

John

JOHN SHOAFF (HE/HIM/HIS) | DIRECTOR
OFFICE OF AIR POLICY & PROGRAM SUPPORT (OAPPS)
OFFICE OF AIR & RADIATION | U.S. EPA | WJC NORTH 5442-C
1200 PENNSYLVANIA AVE. NW | MC 6103A | WASHINGTON, D.C. | 20460 | USA
Shoaff.john@epa.gov | **1-202-564-0531 DIRECT | 1-202-257-1755 MOBILE**

From: Shoaff, John
Sent: Tuesday, December 7, 2021 3:13 PM
To: Goffman, Joseph Goffman.Joseph@epa.gov; Carbonell, Tomas Carbonell.Tomas@epa.gov; Nunez, Alejandra Nunez.Alejandra@epa.gov; Kim, Eunjung Kim.Eun@epa.gov; Peter Tsirigotis (Tsirigotis.Peter@epa.gov) Tsirigotis.Peter@epa.gov; Grundler, Christopher grundler.christopher@epa.gov; Dunham, Sarah (Dunham.Sarah@epa.gov) Dunham.Sarah@epa.gov; Edwards, Jonathan Edwards.Jonathan@epa.gov
Cc: Shaw, Betsy Shaw.Betsy@epa.gov; Ann Campbell (Campbell.Ann@epa.gov) Campbell.Ann@epa.gov; Hooper, Daniel hooper.daniel@epa.gov
Subject: CAAAC background for Air Issues Wed. 12/8 @ 9:30

All,

Please find attached a compilation of programs' initial feedback on the most accessible CAA Anniversary Report recommendations, ideas to reinvigorate our engagement with the CAAAC and the upcoming agenda for discussion with Air Issues tomorrow.

The goal is to agree to an approach to present-discuss this with the CAAAC next week along with raising awareness across-the-board internally with how we're considering or responding to various recommendations.

We envision that Joe could provide a bit of an introduction or overview following his regular update of OAR highlights since our October CAAAC mtg and then handing it off to DAAs and/or ODs to walk through initial responses. The session could then close by touching upon ideas to enhance our engagement.

Thanks for your review and feedback in advance and hoping this will be a fairly focused discussion tomorrow AM.

John

JOHN SHOAFF (HE/HIM/HIS) | DIRECTOR
OFFICE OF AIR POLICY & PROGRAM SUPPORT (OAPPS)
OFFICE OF AIR & RADIATION | U.S. EPA | WJC NORTH 5442-C
1200 PENNSYLVANIA AVE. NW | MC 6103A | WASHINGTON, D.C. | 20460 | USA
Shoaff.john@epa.gov | **1-202-564-0531 DIRECT | 1-202-257-1755 MOBILE**

Message

From: Lin, Walter [lin.walter@epa.gov]
Sent: 12/8/2021 7:46:54 PM
To: OAR Briefings [OAR_Briefings@epa.gov]
CC: Koerber, Mike [Koerber.Mike@epa.gov]; Mozingo, Kristal [Mozingo.Kristal@epa.gov]
Subject: Briefing Material -
Attachments: Pre-EG Part 2-Coke-Ovens-RTR-OAR-12-9-2021 V2.docx

Please see attached briefing material for:

Pre-Early Guidance: Coke Ovens RTR Proposed Rules – Part 2 (Tier 2, SAN 8471) -Thursday, December 9th @ 11:00AM

Thanks,
Walter

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 12/8/2021 9:40:45 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Goffman, Joseph [Goffman.Joseph@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
CC: Hooper, Daniel [hooper.daniel@epa.gov]
Subject: RE: Reg Actions

Taking a stab at prioritizing the actions currently in house:

In IO Now

Ex. 5 Deliberative Process (DP)

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Sent: Wednesday, December 8, 2021 8:49 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>; Goffman, Joseph <Goffman.Joseph@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>; Kim, Eunjung <Kim.Eun@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: RE: Reg Actions

Ex. 5 Deliberative Process (DP)

Tomás

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Wednesday, December 8, 2021 8:39 AM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>; Carbonell, Tomas <Carbonell.Tomas@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>; Kim, Eunjung <Kim.Eun@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: Reg Actions

Rather than take up time on RT, I pulled together the information below to make you all aware of what packages are in the IO (first section) and what I hope is a complete list of what's to come (note these is duplication between the lists). I

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It was my hope to avoid this kind of situation and I will be speaking to the reg managers in the next day or so to better understand the how of this and where we can improve. Better planning is needed as this almost seems unworkable.

Ex. 5 Deliberative Process (DP)

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: Gibson, Neshawne [Gibson.Neshawne@epa.gov]
Sent: 12/8/2021 11:23:55 PM
To: Gibson, Neshawne [Gibson.Neshawne@epa.gov]
Subject: Administrator's Weekly Report for 12/8/21
Attachments: Administrator Weekly Report 12.8.21 FINAL.pdf; Administrator Weekly Report 12.8.21 FINAL.docx

Hello Administrator Regan and colleagues,

Attached, please find the Administrator's Weekly Report (in both PDF and Word), which includes programs and regional office updates for the week ending December 8, 2021.

Sincerely,

Neshawne Gibson
Office of the Administrator
US Environmental Protection Agency
Phone: (202) 566-1957
Mobile: (202) 603-7617

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 12/2/2021 4:08:24 PM
To: Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Kim, Eunjung [Kim.Eun@epa.gov]
Subject: For OAR Review: Updated HD 2027 Proposal
Attachments: SAN 7165 RIN 2060-AU41 HD2027 Preamble and Regs for OMB Review 20211202_for OAR Review.docx; SAN 7165 RIN 2060-AU41 HD2027 RIA for OMB Review 20211202_for OAR review.docx; SAN 7165 RIN 2060-AU41 HD2027 Preamble and Regs for OMB Review 20211202_RLSO.docx

Importance: High

Ale, Joe – the HDV revisions have been completed and are attached. Bill should be sending to you shortly a summary of the edits made for ease of review. Please let me know if we have the green light to send to OP and upload.

Thanks,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Phillips, Tuana <phillips.tuana@epa.gov>
Sent: Thursday, December 2, 2021 10:00 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Charmley, William <charmley.william@epa.gov>; Sargeant, Kathryn <sargeant.kathryn@epa.gov>; Nelson, Brian <nelson.brian@epa.gov>; Sanchez, James <sanchez.james@epa.gov>; Brakora, Jessica <Brakora.Jessica@epa.gov>; Carrillo, Andrea <Carrillo.Andrea@epa.gov>; Cullen, Angela <cullen.angela@epa.gov>; Yanca, Catherine <yanca.catherine@epa.gov>; Parsons, Christy <Parsons.Christy@epa.gov>; Burch, Julia <Burch.Julia@epa.gov>; Herbolsheimer, Courtney <herbolsheimer.courtney@epa.gov>; Mroz, Jessica <mroz.jessica@epa.gov>; Dunham, Sarah <Dunham.Sarah@epa.gov>; Hengst, Benjamin <Hengst.Benjamin@epa.gov>; Mcquilkin, Wendy <Mcquilkin.Wendy@epa.gov>
Subject: FW: For OAR Review: Updated HD 2027 Proposal
Importance: High

Good morning Ann,

Attached is an updated copy of the Heavy Duty 2027+ preamble and regulatory text. There were no changes made to the RIA but it is also attached for reference. The third attachment is a RLSO version of the preamble and regs. Please see Christy's email below for more information and a summary of the revisions that were made, and let us know if you need anything else from us.

Best,
Tuana Phillips
Office of Transportation and Air Quality (OTAQ)
U.S. Environmental Protection Agency
Phone: (202)-565-0074
Pronouns: she/her/hers

From: Parsons, Christy <Parsons.Christy@epa.gov>
Sent: Thursday, December 2, 2021 9:38 AM
To: Phillips, Tuana <phillips.tuana@epa.gov>

Cc: Charmley, William <charmley.william@epa.gov>; Sargeant, Kathryn <sargeant.kathryn@epa.gov>; Nelson, Brian <nelson.brian@epa.gov>; Sanchez, James <sanchez.james@epa.gov>; Brakora, Jessica <Brakora.Jessica@epa.gov>; Carrillo, Andrea <Carrillo.Andrea@epa.gov>; Cullen, Angela <cullen.angela@epa.gov>; Yanca, Catherine <yanca.catherine@epa.gov>
Subject: For OAR Review: Updated HD 2027 Proposal
Importance: High

Tuana,

Attached is an updated version of the Heavy Duty 2027 draft preamble to share with OAR.

Ex. 5 Deliberative Process (DP)

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/3/2021 9:36:54 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Monday, December 6
Attachments: 2021 12 06 Pre-Brief for EtO Congressional Caucus Meeting - Briefing Memo FINAL.docx; 12-06-21 - Indoor PM Overview - OAR AA - Goffman.pptx; OAR OP Monthly_120621.final annotated.docx; 2021 12 06 Pre-Brief for EtO Congressional Caucus Meeting - Slides.pptx

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Monday, December 6, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

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Busy
Out of Office
Tentative
Working Elsewhere
Free
Outside of Working Hours

December 2021

Mon, Dec 6

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Prep for EtO Congressional Caucus Prebrief (OCIR to send Monday)
	9:30 AM – 10:00 AM	**Free**
	10:00 AM – 10:30 AM	Management Roundtable
	10:30 AM – 11:00 AM	Air Issues Meeting
	11:00 AM – 11:30 AM	Indoor PM Overview Briefing (1 ppt)
	11:30 AM – 12:00 PM	OAQPS Weekly
	12:00 PM – 12:30 PM	**Free**
	12:30 PM – 1:00 PM	EPA/NHTSA Discussion
	12:30 PM – 1:00 PM	Video-call: Weekly Infrastructure Meeting

■	1:00 PM – 2:00 PM	Video-call: Weekly BID/BBB Implementation Steering Committee Meetings
■	2:00 PM – 2:30 PM	Video-call: Briefing: EtO Caucus (1 word doc, 1 ppt)
■	2:00 PM – 3:00 PM	Senior Staff Meeting
■	3:00 PM – 3:30 PM	OAP Weekly
■	3:30 PM – 4:00 PM	LDV Rollout
■	4:00 PM – 5:00 PM	Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM) Industries and Wastes (this meeting will most likely be rescheduled to January at the request of ORIA)
■	5:00 PM – 5:30 PM	OAR/OP Monthly Meeting (1 word file)
□	**After 5:30 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/8/2021 9:50:57 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Thursday, December 9
Attachments: Weekly w/Joe Goffman - background for HSR Noise discussion; Pre-EG Part 2-Coke-Ovens-RTR-OAR-12-9-2021 V2.docx; LAB_Manufacturing OAR.12.09.2021.docx; Materials for NC Trip

Additional materials: materials for NC trip (email)

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Thursday, December 9, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

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Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

December 2021

Thu, Dec 9

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Comms weekly
	10:00 AM – 10:30 AM	Weekly w/Joe Goffman (1 email)
	10:30 AM – 11:00 AM	One-on-One with Jon Edwards
	11:00 AM – 12:00 PM	Pre-Early Guidance: Coke Ovens RTR Proposed Rules – Part 2 (Tier 2, SAN 8471) (1 word doc)
	12:00 PM – 12:30 PM	Fuels Bi-weekly
	12:30 PM – 1:00 PM	Phone-call: Governor Mark Gordon, WY
	1:00 PM – 2:00 PM	Decisional Briefing for Lead Acid Battery Manufacturing NESHAP and NSPS review proposals (Tier 3, SAN 8602 and 8603) (1 word doc)

■	2:00 PM – 2:30 PM	Light-Duty Vehicles Update
■	2:30 PM – 3:00 PM	OTAQ Weekly
■	3:00 PM – 3:30 PM	Scheduling Meeting
■	3:30 PM – 4:00 PM	One-on-One with Chris Grundler
■	4:00 PM – 6:00 PM	Travel Time
■	6:00 PM – 7:30 PM	Catch Flight to RTP
□	**After 7:30 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/6/2021 10:15:03 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Tuesday, December 7
Attachments: 2021 12 07 OAR Pre-Brief 2 OS RFS Set Rule - Briefing Memo.docx; 2021 12 07 OAR Pre-Brief 2 OS RFS Set Rule - Slides V2.0.pptx; Points/background for COP26 Sync, Tues. 12/7 @ 11 AM; The Future of Nuclear Energy 20211207.1.pptx; Briefing Material - Pre-brief Administrator Visit to RTP; FW: Dieu, Martin shared "2021 12 07 COP26 Sync - AMR Remarks" with you.; for Continuous Improvement briefing 3pm Tuesday 12/7; SJV EarthJustice Prep Pager_12.1.21.docx

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Tuesday, December 7, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

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Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

December 2021

Tue, Dec 7

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:30 AM	Video-call: Second Pre-Brief for Options Selection for the Renewable Fuels Standard (RFS) Set Rule (1 word doc, 1 ppt)
	10:30 AM – 11:00 AM	OAR Senior Staff
	11:00 AM – 11:30 AM	Video-call: COP26 Sync (2 emails)
	11:30 AM – 12:00 PM	The future of the Nuclear Energy (1 ppt)
	12:00 PM – 1:00 PM	Infrastructure Preparedness Planning
	1:00 PM – 1:30 PM	Weekly Check-In with Joe

■	1:30 PM – 2:00 PM	OTAQ Weekly
■	2:00 PM – 3:00 PM	Pre-brief Administrator Visit to RTP (1 email)
□	**3:00 PM – 4:00 PM**	**Free**
■	4:00 PM – 4:45 PM	Continuous Improvement Briefing (1 email)
□	**4:45 PM – 5:00 PM**	**Free**
■	5:00 PM – 6:30 PM	Meeting with EarthJustice re: PM 2.5 (1 word doc – same one from Friday used for pre-brief)
■	6:30 PM – 7:15 PM	General Discussion
□	**After 7:15 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Lin, Walter [lin.walter@epa.gov]
Sent: 12/10/2021 7:30:39 PM
To: OAR Briefings [OAR_Briefings@epa.gov]
CC: Koerber, Mike [Koerber.Mike@epa.gov]; Mozingo, Kristal [Mozingo.Kristal@epa.gov]
Subject: Briefing Material - Early Guidance: Coke Ovens RTR Proposed Rules (Tier 2, SAN 8471)
Attachments: Coke-Ovens-RTR-EG-OAR-12-13-2021 (003).docx

Please see attached briefing material for:

Early Guidance: Coke Ovens RTR Proposed Rules (Tier 2, SAN 8471) – Monday, December 13th @ 10:30AM

Thanks,
Walter

Message

From: Kim, Eunjung [Kim.Eun@epa.gov]
Sent: 12/9/2021 10:31:29 PM
To: Hooper, Daniel [hooper.daniel@epa.gov]; Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]
Subject: RE: Materials for NC Trip
Attachments: NC Sketch.docx; 2021 12 10 Volvo HQ Visit_ML_EK_MTM.docx; 12.9.21 Volvo roundtable TPs - 1045am.docx; Briefing memo Risk from Total Air Toxics Identifcation and Solutions.docx; Total_Air_Exposure_Ax briefing_120221r.pptx; 2021 12 10 N&O Attachment 1 Toyota to build $1.3B battery plant near Greensboro NC _ Raleigh News Observer.pdf; 2021 12 10 N&O Attachment 2 Duke Energy strikes fee agreement with NC solar industry _ Raleigh News Observer.pdf; 2021 12 10 Event Memo Lunch Meeting w UAW_Final.docx; 2021 12 10 Interview Memo News and Observer 12.10.21.docx

Hey Joe,
I wanted to add a few additional materials to your folder. I am including the Memo for the lunch with Ray Curry. Also the Administrator is doing an interview in the car on the way to lunch. In case you are going to be with him, I have included those materials FYA.

Thanks!

Eunjung Kim
Special Assistant
Office of Air and Radiation
Environmental Protection Agency
(202) 815-7252

From: Hooper, Daniel <hooper.daniel@epa.gov>
Sent: Thursday, December 9, 2021 5:13 PM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>; Kim, Eunjung <Kim.Eun@epa.gov>
Cc: Nunez, Alejandra <Nunez.Alejandra@epa.gov>; Campbell, Ann <Campbell.Ann@epa.gov>; Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Subject: RE: Materials for NC Trip

Joe,

Please see all relevant materials for your NC trip attached to this email – I'm also putting this email in your daily briefing book for reference as well.

Thanks
Dan

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

From: Goffman, Joseph <Goffman.Joseph@epa.gov>
Sent: Thursday, December 9, 2021 3:59 PM

To: Kim, Eunjung <Kim.Eun@epa.gov>
Cc: Nunez, Alejandra <Nunez.Alejandra@epa.gov>; Campbell, Ann <Campbell.Ann@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>; Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Subject: RE: Materials for NC Trip

Is there a copy of the Administrator's entire schedule for Friday? Thanks.

Joseph Goffman
Principal Deputy Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

From: Kim, Eunjung <Kim.Eun@epa.gov>
Sent: Wednesday, December 8, 2021 3:26 PM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>
Cc: Nunez, Alejandra <Nunez.Alejandra@epa.gov>; Campbell, Ann <Campbell.Ann@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>; Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Subject: Materials for NC Trip

Hey Joe,
Here are the final materials for the NC trip. I am still waiting to get my hands on the final version of the Volvo remarks and will pass that along as soon as I get them.

Thanks!

Eunjung Kim
Special Assistant
Office of Air and Radiation
Environmental Protection Agency
(202) 815-7252

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/9/2021 10:45:13 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Friday, December 10
Attachments: Limtree issue paper_12-7-21.docx; RE: Materials for NC Trip; FW: Comms materials for Seasonality and Climate Change report

Additional materials:

(1) NC trip details and materials (Eunjung's email with all materials attached)

(2) Comms materials for Seasonality and Climate Change report (email attached);

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Friday, December 10, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

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Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

December 2021

Fri, Dec 10

All Day	Travel to RTP/NC
9:00 AM – 10:30 AM	Video-call: EJ and Air Toxics Regulations (in attached NC trip email)
10:30 AM – 1:00 PM	Travel to Greensboro/Lunch
11:00 AM – 11:30 AM	Delegated to Ale: One-on-One with Sarah Dunham
1:00 PM – 3:00 PM	Volvo Tour and Meeting (in attached NC trip email)
3:00 PM – 4:30 PM	Travel to Airport
4:00 PM – 5:00 PM	BIL Travel Planning
4:15 PM – 5:15 PM	Video-call: Limetree Bay Briefing, Region 2 (1 word doc)

▒	5:15 PM – 6:00 PM	General Discussion
▒	5:33 PM – 9:00 PM	Flight to DCA

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 12/14/2021 4:46:29 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: REVISED: Reg Actions: Status for 1:1 with Dan

Joe, the list below shows the REVISED actions we are teeing up for signature, their status and anticipated timing for signature. I also included a similar list for OMB so you have an awareness of where I'm focused for tomorrow's OIRA call. Please let me know if you have any questions.

Ex. 5 Deliberative Process (DP)

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 12/16/2021 12:16:50 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]
Subject: FOR YOUR SIGNATURE: NPRM Primary Copper SAN 7522
Attachments: 4_Draft Fact Sheet_PrimaryCopperRTR_Proposal 12-09-2022.docx; 5_FW_ OGC concurrence for signature of Primary Copper Proposed rule.pdf; 11.22 Typesetting request for Primary Copper Smelting RTR.pdf; 3_Primary Cu DRAFT Comm Plan 12-1-2021-clean.docx; Primary Copper NPRM Action Memo.doc; RE: FOR YOUR REVIEW: NPRM Primary Copper SAN 7522

Importance: High

Joe, the attached is ready for your review and signature on the action memo. Tomas has reviewed and concurred (attached). The Final for this action is court ordered for April 1, 2022.

Thank you,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Morgan, Ruthw <morgan.ruthw@epa.gov>
Sent: Tuesday, December 14, 2021 8:13 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Cc: OAQPSREGPROCESSING <OAQPSREGPROCESSING@epa.gov>; Lubetsky, Jonathan <Lubetsky.Jonathan@epa.gov>; Mcquilkin, Wendy <Mcquilkin.Wendy@epa.gov>; Olson, Heather <Olson.Heather@epa.gov>; Morgan, Ruthw <morgan.ruthw@epa.gov>; Iglesias, Amber <Iglesias.Amber@epa.gov>; Culligan, Kevin <Culligan.Kevin@epa.gov>; Chang, Alice <Chang.Alice@epa.gov>
Subject: For Signature: NPRM Primary Copper SAN 7522
Importance: High

To: Immediate Office for review on signature package.

Attached is the signature package for the proposed National Emission Standards for Hazardous Air Pollutants: Primary Copper Smelting Residual Risk and Technology Review and Primary Copper Smelting Area Source Technology Review (SAN 7522). I will have a CMS number shortly and will send when available. This package has a consent decree of 4/1/2022 for the final action.

POC: Amber Iglesias
202-564-3175

Thanks!

Ruthw Morgan – 202 564-1326

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 12/16/2021 9:36:19 PM
To: Shaw, Betsy [Shaw.Betsy@epa.gov]
CC: Goffman, Joseph [Goffman.Joseph@epa.gov]
Subject: FW: Special Assistant Interviews and Next Steps
Attachments: Ex. 6 Personal Privacy (PP)

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Drinkard, Andrea <Drinkard.Andrea@epa.gov>
Sent: Tuesday, December 14, 2021 1:44 PM
To: Utech, Dan <Utech.Dan@epa.gov>; McCabe, Janet <McCabe.Janet@epa.gov>
Cc: Carpenter, Wesley <Carpenter.Wesley@epa.gov>; Atkinson, Emily <Atkinson.Emily@epa.gov>; Monger, Jon <Monger.Jon@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>; Campbell, Ann <Campbell.Ann@epa.gov>; Hilosky, Nick <Hilosky.Nick@epa.gov>; Aguirre, Janita <Aguirre.Janita@epa.gov>; Hoover, Zealan <Hoover.Zealan@epa.gov>; Willis, Sharnett <Willis.Sharnett@epa.gov>
Subject: Special Assistant Interviews and Next Steps

Hi Dan and Janet,

I am excited to let you know that we are ready for you to interview candidates for the first two special assistant positions—Air and Climate and Water and Infrastructure. The panel is referring two candidates for each position, but we would like you to keep in mind that while we are filling the first two positions, each of these candidates could potentially be considered for the remaining four positions if they are not selected for Air and Climate or Water and Infrastructure.

As far as preparation for the interviews, I am including the candidates and their resumes below. I am also including a list of questions that you could pull from for the interview, also below. Zealan and a rep from OW will join the OW/Infrastructure interviews, and Joe will try to join the OAR/climate interviews.

Emily will work to find a few minutes for us to connect prior to the interviews, which we hope will take place on Friday or Monday/Tuesday next week.

Please let me know if anyone has questions!

-Andrea-

Possible Interview Questions

SA_Interview_Q...
Janet and Dan_v...

Candidates – Unranked

Air and Climate

Ex. 6 Personal Privacy (PP)

Water and Infrastructure

Ex. 6 Personal Privacy (PP)

Andrea Drinkard
Senior Advisor to the Deputy Administrator
U.S. Environmental Protection Agency
Desk: 202.564.1601
Cell: 202.236.7765

Message

From: Kim, Eunjung [Kim.Eun@epa.gov]
Sent: 12/10/2021 7:39:21 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]
Subject: REVIEW - Administrator Materials Power Plant Outreach
Attachments: 2021 12 14 OAR Outreach on Climate Rules for the Power Sector - Briefing Memo 2.0.docx; 2021 12 14 OAR Outreach on Climate Rules for the Power Sector - Slides.pptx

Hey Joe and Tomas,
Attached are the new drafts of materials for Tuesday's briefing with the Administrator on the Power Plant Strategy Outreach. You have already reviewed a previous version of the materials. The only changes made were the timings for next steps given this briefing was pushed back to mid-December.
Please review by 9 am Monday, if necessary.
Thanks!

Eunjung Kim
Special Assistant
Office of Air and Radiation
Environmental Protection Agency
(202) 815-7252

Message

From: Peacock, Grant [Peacock.Grant@epa.gov]
Sent: 12/10/2021 9:36:10 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Shaw, Betsy [Shaw.Betsy@epa.gov]; Edwards, Jonathan [Edwards.Jonathan@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Dunham, Sarah [Dunham.Sarah@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hyde, Courtney [Hyde.Courtney@epa.gov]; Wolfe, Michael [Wolfe.Michael@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]; Rowson, David [Rowson.David@epa.gov]; Veal, Lee [Veal.Lee@epa.gov]; Griggs, John [Griggs.John@epa.gov]; Cherepy, Andrea [Cherepy.Andrea@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Bunker, Byron [bunker.byron@epa.gov]; Burch, Julia [Burch.Julia@epa.gov]; 'Harvey, Reid' [Harvey.Reid@epa.gov]; Lubetsky, Jonathan [Lubetsky.Jonathan@epa.gov]; Gunning, Paul [Gunning.Paul@epa.gov]; Newberg, Cindy [Newberg.Cindy@epa.gov]; 'Snyder, Carolyn' [Snyder.Carolyn@epa.gov]; Hopkins, Daniel [Hopkins.Daniel@epa.gov]; Koerber, Mike [Koerber.Mike@epa.gov]; Kornylak, Vera S. [Kornylak.Vera@epa.gov]; Brachtl, Megan [Brachtl.Megan@epa.gov]; Costa, Shelley [Costa.Shelley@epa.gov]; Whitlow, Jeff [Whitlow.Jeff@epa.gov]; Saltman, Tamara [Saltman.Tamara@epa.gov]; Monroe, Scott [Monroe.Scott@epa.gov]; LaRue, Steven [LaRue.Steven@epa.gov]; Mathias, Scott [Mathias.Scott@epa.gov]; Bullard, Pamela [Bullard.Pamela@epa.gov]; Alpert, Adina [Alpert.Adina@epa.gov]; Santiago, Juan [Santiago.Juan@epa.gov]; White, Sharon [White.Sharon@epa.gov]; Diaz, Charlene [diaz.charlene@epa.gov]; Wilds, Edward [Wilds.Edward@epa.gov]; White, Rick [White.Rick@epa.gov]; Stafford, Andrea [Stafford.Andrea@epa.gov]; Fine, Steven [fine.steven@epa.gov]; Siegel, Kelly C. [Siegel.KellyC@epa.gov]; Shoaff, John [Shoaff.John@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Watkins, Erica [Watkins.Erica@epa.gov]; Clark, Mike S. [Clark.Michael@epa.gov]; OAR Briefings [OAR_Briefings@epa.gov]; Suzuki, Debra [Suzuki.Debra@epa.gov]; Senter, Stephen [Senter.Stephen@epa.gov]; Millar, Emily [Millar.Emily@epa.gov]; Holden, Patricia [Holden.Patricia@epa.gov]; Marusiak, Eleanor [Marusiak.Eleanor@epa.gov]; Kabanda, Thierry [Kabanda.Thierry@epa.gov]; Rakosnik, Delaney [rakosnik.delaney@epa.gov]; Henning, Julie [henning.julie@epa.gov]; Ward, Hillary [Ward.Hillary@epa.gov]; Biton, Leiran [biton.leiran@epa.gov]; Hamjian, Lynne [Hamjian.Lynne@epa.gov]; Greene, Cynthia [Greene.Cynthia@epa.gov]; Walker, Lakeshia [Walker.Lakeshia@epa.gov]; Schumm, Krystal [Schumm.Krystal@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Vincent, Marc [Vincent.Marc@epa.gov]
CC: DeLuca, Isabel [DeLuca.Isabel@epa.gov]; Millett, John [Millett.John@epa.gov]
Subject: December Business Review Materials
Attachments: FY 2022 Bowling Chart_December.xlsx; Dec 2021 OAR Business Review Agenda.docx; Nov 21_Ideas Improvements Celebrations.xlsx

Good Afternoon All,

Attached are the materials for the December 14, 2:00 PM-3:00 PM, OAR Business Review, which include the:

- Agenda;
- Bowling Chart; and
- MBR Supplemental (processes improved, employee ideas, celebrations).

Additional materials will be sent before the Tuesday meeting.

Please remember that all Business Review materials are internal to the EPA.

Let us know if you have any questions.

Thanks,
Grant Peacock
Office of Program Management Operations
Office of Air and Radiation

(202) 564-6732

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 12/16/2021 9:55:13 PM
To: McCabe, Janet [McCabe.Janet@epa.gov]; Utech, Dan [Utech.Dan@epa.gov]; Monger, Jon [Monger.Jon@epa.gov]; Goffman, Joseph [Goffman.Joseph@epa.gov]; Hoover, Zealan [Hoover.Zealan@epa.gov]
CC: Drinkard, Andrea [Drinkard.Andrea@epa.gov]
Subject: Materials for the Special Assistant Interviews
Attachments: Ex. 6 Personal Privacy (PP)

Friday, 12/17 at 8:00am
Interview Prep Session
Janet, Dan, Jon, Joe, Zealan and Andrea

Agenda
- Background and update on process – how we got here (Andrea)
- Run of show for interviews (Andrea)
- Q&As for interviews (Group)
- Timing and next steps (Andrea)
- Discussion (Group)

SA_Interview_Q...
Janet and Dan_v...

Ex. 6 Personal Privacy (PP)

Ex. 6 Personal Privacy (PP)

Message

From: Shaw, Betsy [Shaw.Betsy@epa.gov]
Sent: 12/13/2021 11:29:24 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Koerber, Mike [Koerber.Mike@epa.gov]; Wayland, Richard [Wayland.Richard@epa.gov]; Benedict, Kristen [Benedict.Kristen@epa.gov]; Profeta, Timothy [Profeta.Timothy@epa.gov]; Terry, Sara [Terry.Sara@epa.gov]; Dunham, Sarah [Dunham.Sarah@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Henning, Julie [henning.julie@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]; Moltzen, Michael [Moltzen.Michael@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Kocchi, Suzanne [Kocchi.Suzanne@epa.gov]; Alpert, Adina [Alpert.Adina@epa.gov]; Hopkins, Daniel [Hopkins.Daniel@epa.gov]; Edwards, Jonathan [Edwards.Jonathan@epa.gov]; Cherepy, Andrea [Cherepy.Andrea@epa.gov]; Rowson, David [Rowson.David@epa.gov]; Smith, Alisa [Smith.Alisa@epa.gov]; Bullard, Pamela [Bullard.Pamela@epa.gov]; Shoaff, John [Shoaff.John@epa.gov]; Lubetsky, Jonathan [Lubetsky.Jonathan@epa.gov]; Hockstad, Leif [Hockstad.Leif@epa.gov]; Saltman, Tamara [Saltman.Tamara@epa.gov]; Weinstock, Larry [Weinstock.Larry@epa.gov]; Hyde, Courtney [Hyde.Courtney@epa.gov]; Marusiak, Eleanor [Marusiak.Eleanor@epa.gov]; Wolfe, Michael [Wolfe.Michael@epa.gov]; LaRue, Steven [LaRue.Steven@epa.gov]; Roberts, Timothy-P [Roberts.Timothy-P@epa.gov]; Vincent, Marc [Vincent.Marc@epa.gov]; Siegel, Kelly C. [Siegel.KellyC@epa.gov]; Monroe, Scott [Monroe.Scott@epa.gov]; Millett, John [Millett.John@epa.gov]; DeLuca, Isabel [DeLuca.Isabel@epa.gov]; Hamjian, Lynne [Hamjian.Lynne@epa.gov]; Greene, Cynthia [Greene.Cynthia@epa.gov]
Subject: Agenda and Materials for 12/14 OAR IPP Meeting
Attachments: Agenda for OAR IPP Meeting 12-14-21 .docx; OneDrive_1_12-13-2021.zip; Draft OAR BBB Summary_12-13-21.docx

Hi all,

Attached is the agenda for tomorrow's OAR Infrastructure Preparedness Planning meeting at 11:00 a.m. E.T. Thanks for uploading the individual program fact sheets to the OAR Reconciliation and Infrastructure Teams channel last week. I'm sending them along as a zip file for convenience. Also attached for your review and use is a shorter summary document OPMO put together using select fields from the Fact Sheets. We can discuss this tomorrow and refine as things progress.

Talk to you tomorrow,

Betsy

Fact Sheet on BBB Provisions

Specific Provision: *SEC.30106. Funding to Address Air Pollution (a)(1) Fenceline Air Monitoring and Screening Air Monitoring. Appropriation of $117,500,000 to remain available until September 30, 2031 for grants and other activities authorized under subsections (a) through (c) of section 103 and section 105 of the Clean Air Act to deploy, integrate, support, and maintain fenceline air monitoring, screening air monitoring, national air toxics trends stations, and other air toxics and community monitoring.*

Office Role

1. Is [**OAR**] the lead office for this provision? *Yes*
    a. If yes, please identify, which, if any, organizations would collaborate on designing and implementing this provision.
        i. Within [OAQPS]: *AQAD*
        ii. Within OAR: *OAQPS and OAP*
        iii. Across EPA: *Allocations/grants coordinated through EPA Regional Offices*
        iv. Across USG: *N/A*
    b. If no, is [INSERT OFFICE] playing a supporting role with technical expertise/assistance?
        i. Which office(s) is lead? *N/A*
        ii. Do you already work with the office(s) on existing and/or related work? *N/A*
            1. If yes, please identify existing program/work area: *N/A*

2. What pros and cons to OAR leading or supporting implementation of this provision? *Identify importance of Office/Division role to help determine which provisions would need to be triage or prioritize, particularly from an environmental/human health impact.*
    a. Pros: OAR/OAQPS are ~~N~~national experts in source and ambient air monitoring, including regulations. Existing relationships and mechanisms with EPA Regions and State, Local, and Tribal partners in executing Section 103 and 105 grants. Experience in working to make $50M available to improve ambient air quality monitoring for communities across the United States under the American Rescue Plan including identification of needs beyond the amount available. ~~Addressing~~ Addresses the needs to sustain and modernize the national ambient air monitoring program described in the November 2020 GAO Report titled, "Air Pollution – Opportunities to Better Sustain and Modernize the National Air Quality Monitoring System" (https://www.gao.gov/products/GAO-21-38).
    b. Cons: Additional staffing needed in OAQPS HQ and Regional EPA offices.

Ideal Program Design

1. Is OAR existing work relevant to this provision? *Yes*
    a. If yes, what is it and briefly what would that mean for the existing program/project?
        - National Ambient Air Monitoring Program – Enhance, expand, and transform existing ambient air monitoring networks by addressing findings in the November 2020 GAO Report titled, "Air Pollution – Opportunities to Better Sustain and Modernize the National Air Quality Monitoring System" (https://www.gao.gov/products/GAO-21-38) and make additional funding opportunities available through competitive grants, direct awards to S/L/Ts, regional capacity for community monitoring, and other activities.

- National Air Toxics Trends Stations (NATTS) – Enhance operation and maintenance funds for existing NATTS sites and expand total number of sites.
- Fenceline Air Monitoring and Screening Air Monitoring Methods – Enhance existing efforts to evaluate new air toxic fenceline and ambient methods to be able to measure in real time and at levels of concern.
- Manage air quality data from monitors – Transform existing, national databases (e.g., AQS and AirNow) into a single ambient system to incorporate new and existing data flows and enhance user experience.
- Clean Air Status and Trends Network (CASTNET) – Build monitoring resiliency into the existing long-term monitoring programs, including modernizing criteria pollutant and supporting equipment (e.g., ozone analyzers, meteorological sensors), automated data systems, and infrastructure. Expand tribal monitoring capacity and training to support the measurement of ambient mercury concentrations and deposition.

2. In the absence of additional information, what is your initial vision for program design of this provision?
   - **Direct Awards to S/L/Ts: $42.5M total** [Enhance existing grant program]
     - $22.5M year 1&2 for ambient air criteria pollutant equipment repairs, replacement, implementation, expansion, and air toxics monitoring
     - $20M years 3-10 for operation and maintenance (O&M) allocated to the S/L/Ts through the Regions ($2M/year)
   - **Community Scale Air Toxics Grants (FY23) - $5M** [Repeat Prior Competition]
   - **Community Monitoring Grant Competition (FY25) - $20M** [Repeat ARP Competition]
   - **Fenceline Air Monitoring and Screening Air Monitoring Methods –** [Enhance existing work]
     - Air Toxics Methods Development **$9.5M**
   - **Contract Award: $3.125M total** [Enhance existing CASTNET air monitoring program]
     - -$2.125M year 1&2 for ambient air criteria pollutant equipment repairs & replacement, building resiliency into existing infrastructure
     - -$1M years 3-10 for O&M allocated to support mercury monitoring at tribal sites
   - **O&M for EPA Regional mobile monitoring - $4M** (~400K/year) [Enhance ARP Capital Investments]
   - **National Air Toxics Trends Stations – $18M total** [Enhance and expand existing program]
     - Increase O&M for existing NATTS sites - $1M/year ($20K/site) - $10M
     - Increase number of NATTS sites -$2M capital + $750K/year in years 3-10 - $10M
   - **Manage air quality data from monitors** [Transform existing databases] **- $9.5M**
   - **EPA Program Administrative and Oversight Funds (5%): $5.875M**

   a. To the extent that you do not answer above in the description of the design, please answer Yes/No to the following: N/A
      i. Is this a grant program? N/A
      ii. Is this a green bank? N/A
      iii. Is this a revolving fund? N/A
      iv. Is this a new regulatory program? N/A
      v. Is this a new partnership program? N/A

vi. Other (if so please describe)? N/A

3. Is there a EJ component in this is provision? Yes
   a. If yes, is Justice40 implicated? Yes

4. What are the relevant dates, if any, for the provision? *Please describe any timing or dates including those for establishing the program and when any funds provided may or may not expire.*
   - **Direct Awards to S/L/Ts:** Years 1-2 ($22.5/M); years 3-10 ($2M/year) for O&M~~Operation and Maintenance~~
   - **Community Scale Air Toxics Grants –** Develop RFA for release in FY23 (year 2) when current grants wrap up/expire.
   - **Community Monitoring Grant Competition –** FY22 (year 1) or FY25 (year 4) – Enhance ARP awards or run new competition when ARP grants wrap up/expire.
   - **Fenceline and Screening** – Method Development spread out over five years (year 1 = $1.5M, year 2 = $3.5M, year 3= S1.25M, year 4 = $1.25M, year 5 = $2M)
   - **National Air Toxics Trends Stations** – Increase O&M ~~operation and maintenance~~ support for existing sites for ten years ($1M/year) and increase number of new sites ($2M years 1-2) and $750K/year for eight years to support new sites.
   - **Regional Mobile Monitoring** – O&M ~~Operation and Maintenance~~ of mobile monitoring platforms for ten years
   - **Manage Air Quality Data from Monitors over three years** – year 1 = $1.5M, year 2 = $5M, year 3= S3M)
   - **CASTNET** – $2.125M total in year 1&2 for ambient air criteria pollutant equipment repairs, replacement, implementation, expansion and monitoring of emerging and toxic pollutants; $1M total divided in years 3-10 for O&M.

5. What are the initial questions or challenges we have with this program or provision? *List as separate bullets, try to hit major questions and identify which Office(s) need to advise (e.g., OGC). Does not need to be comprehensive at this point.*
   a. Confirm we can plan for ~~operation and maintenance~~O&M needs of network(s) over 10 year period.
   b. Can we use BBB funds to expand or award ARP community monitoring competition?

Context From Provision

6. Do you have any context for the origin or goal of this provision based on prior engagement or technical assistance with stakeholders, Hill staff, the WH, etc? *Yes*
   a. If yes, please describe the context purpose below. *Identify the type of engagement and stakeholder(s) (e.g., technical assistance through OCIR on x, based on discussion with staff they would like to accomplish y).*
      - EPA agreement with GAO findings and recommendations in the November 2020 GAO Report titled, "Air Pollution – Opportunities to Better Sustain and Modernize the National Air Quality Monitoring System" (https://www.gao.gov/products/GAO-21-38). Experience in working with S/L/Ts, communities, and EPA Regions to make $50M available to improve ambient air

quality monitoring for communities across the United States under the American Rescue Plan including identification of needs beyond the amount available. Existing relationships with State, Local, and Tribal air monitoring agencies to address outstanding issues across networks for enhancements and modernization.

7. Who are the key stakeholders impacted by this provision? *In a bulleted list please list stakeholders that have been engaged in this topic as well as those that should be engaged.*

    - State, local, and tribal air agencies
    - Communities
    - EPA Regions

8. Who are the potential recipients of the funding under this provision? *List as separate bullets potential recipients of funding (i.e., states, municipalities, tribes, community groups, private companies) and any specific challenges that these recipients may have with this provision.*

    - State, local, and tribal air agencies
    - Community groups (e.g., non-profit community-based organizations)
    - EPA HQ and Region Associated Program Support (e.g., methods development, air quality data management, regional mobile monitoring capacity, and ambient air monitoring network oversight)

Relationship to Other Provisions

9. Is this provision potentially related to other provisions of BIL or BBB? *List as separate bullets other provisions in BIL or BBB that may overlap with or relate to the envisioned activities and funding associated with this provision.*
    - SEC.30106. Funding to Address Air Pollution (a)(2) Multipollutant Monitoring Stations
    - SEC.30106. Funding to Address Air Pollution (a)(3) Air Quality Sensors in Low-Income and Disadvantaged Communities
    - SEC.30106. Funding to Address Air Pollution (a)(6) Clean Air Act Grants
    - SEC.30106. Funding to Address Air Pollution (a)(7) Other Activities

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 12/21/2021 12:36:27 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
CC: Hooper, Daniel [hooper.daniel@epa.gov]; Lubetsky, Jonathan [Lubetsky.Jonathan@epa.gov]; Millett, John [Millett.John@epa.gov]; DeLuca, Isabel [DeLuca.Isabel@epa.gov]
Subject: Status of Reg Actions

All – below is the status of our reg actions. Vicki A. pinged Dan and Eric yesterday on the Reg Neg, Primary Copper and FFS SSM packages to try to get them moving. There was a problem with the Administrator's signature on the Aircraft PM package so it has gone back to OEX/AO for signature again.

Ex. 5 Deliberative Process (DP)

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Tribal Air Resources Journal

Accomplishments, Obstacles, Successes and Setbacks of EPA Region 5 Tribes Pertaining to Air Quality

2021 Edition Volume XIII

In this issue:

Wildfire smoke setting records for many Tribes, lead nation in PM

Tribes combating climate change, solar projects highlighted

Ozone study supports Tribe's AQRVs

COVID: Tribes continue to adapt

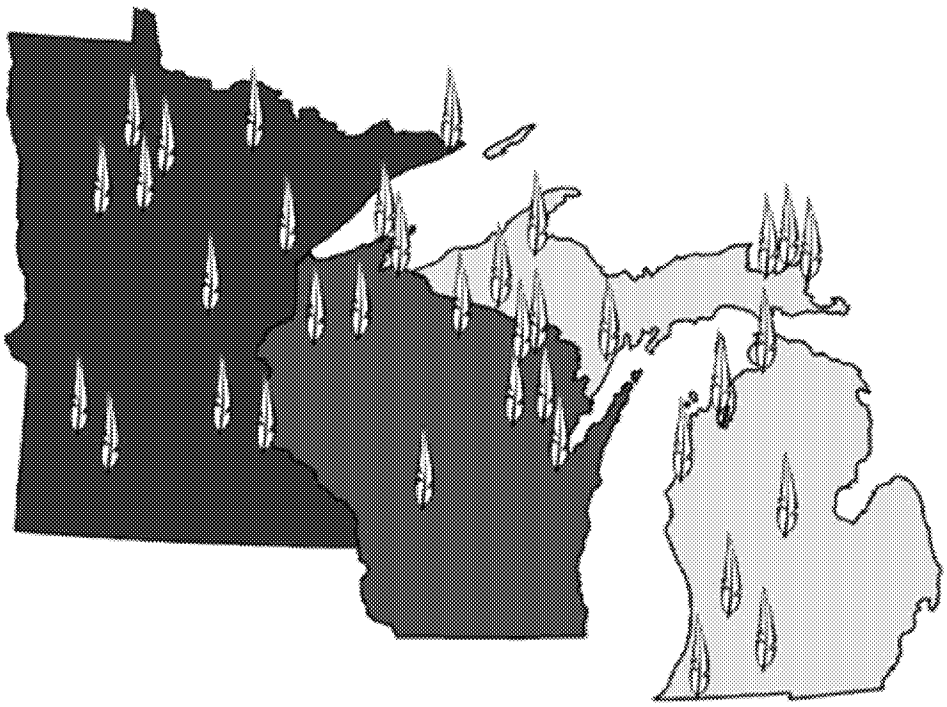
More Tribes work towards Air TAS

IAQ changes due to COVID, both scaling back and going virtual

4 Tribes receive radon SIRG funding, include in PPGs, many more doing radon work outside of SIRG

Tribes getting ready for electric vehicles by installing EV infrastructure

R5 Tribes are highly engaged in local, regional and national venues to promote R5 and Indian Country issues



The *Tribal Air Resources Journal* was started by Tribes in EPA Region 5 to better publicize Tribal Air Quality Program achievements, progression, and struggles to their Tribal Nations as well as in Indian Country. Environmental staff at these Tribal Nations perform many tasks that are often carried out by multiple individuals in state and local governments. Because of this, Tribal professionals are multi-disciplinary and often understand their air quality issues better than staff working for other governments. This situation affords Tribal staff unique opportunities to manage their air resources as they deem necessary. However, this also presents distinctive problems for staff to overcome. Each Tribe is a sovereign nation that applies for, receives and is responsible for administering its own funding and is not linked to the others in terms of governance. It is our hope, in our thirteenth year of publication, that this Journal will communicate the goals, achievements and issues in Indian Country to you, the reader.

The colors in the logo above are taken from the Native American medicine wheel to show our relationship to each other and the environment. The feathers were chosen to mark the location of the Tribal Nations as a symbol of the air and natural resources that we are protecting.

EPA-HQ-2022-2545

Over a Decade of Air Outreach

Welcome to Region 5's thirtieth edition of the Tribal Air Resources Journal. Since 2008 this Journal has provided Tribes with a platform to promote their accomplishments and successes along with sharing obstacles and setbacks encountered along the way. This Journal is not only meant for EPA readers, it is equally meant to tell our story to others across Indian Country, Tribal Nations, federal and state agencies, and other areas of outreach and opportunity. It is the goal of the Journal to create awareness that:

Tribes have viable Air/Environmental Programs and expertise,

Tribes are leading cutting edge projects and studies,

Tribes are sovereign nations and that

Tribes are great partners.

The Journal demonstrates a continuing and underserved need where so much more work is to be done. Over the years, the Tribal Air Resources Journal, has expanded from bare bones entries to a document that includes: location maps, list of contacts, reference pages and a Ceded Territory map. Each Tribal submission is capped at one page, thus creating a short synopsis of the work they do and may have focused on in 2021. Needless to say there is so much more that each Tribe does each year and plans for in the future. Please contact the Tribe(s) with any questions or comments as this is the function of the Journal; to create awareness and conversation.

This year of 2021 has created a multitude of obstacles of which has impacted each Tribal Nation differently. Work has not ceased, most Tribes have found ways to adapt and keep moving progressing. Every Tribe has had some issues with staffing; temporary and permanent layoffs and a lack of applicants to fill positions.

This year you will see the TARJ color is orange. This is to raise awareness of the annual Orange Shirt Day (Sept 30th), which promotes discussion and education of the Residential School System and the impact it has had on Indigenous communities. The orange shirt represents Phylliss Webstad story of her first day at residential school when her new orange shirt, bought by her grandmother, was taken form her as a six-yar old girl. To learn more please visits: http://www.orangeshirtday.org

We, the Tribal Nations of Region 5, thank you in taking the time to read our Air Resources Journal and to share the knowledge you have gained with others.

-Region 5 Tribes

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2021 Summary of Facts for EPA R5 Tribes

Clean Air Act Implementation

- 8 Tribes in R5 currently have Treatment as a State (TAS) status. Of the 8, all TAS Tribes have CAA 105 with reduced grant match and CAA 505(a)(2) for Title V notification. Two of these Tribes also have CAA 126 authority. No new TAS applications were submitted in 2021, however a couple of Tribes are working on submissions potentially in FY22 and others have TAS in their ETEPs and long-range strategic plans.
- 1 Tribe has PSD Class I redesignation. 2 Tribes are in their own response to comments stage of Class I redesignation process and plan to submit formal requests to EPA. One additional Tribe has plans to scope out Class I redesignation. Multiple other Region 5 Tribes are evaluating Class I in their long-range plans.
- In 2016, the SIP Rule change for Wisconsin to comply with Forest County Potawatomi Class I Redesignation has been amended into the Wisconsin SIP for FCP Class I Area administration.

EPA Funding

- ***Clean Air Act*** – 12 Tribes requested $1,626,000 for air quality project/program support from EPA. 12 Tribes were *partially* funded with R5 FY21 State and Tribal Assistance Grant (STAG) funds totaling $1,300,169. 7 Tribes received CAA 103 grant funding and 8 Tribes received CAA 105 grant funding. 6 of the 7 105 grantees have incorporated their Air Grants into a PPG grant for FY20. One Tribe has implemented an air media only PPG. R5 has implemented a 2 year workplan with a staggered funding structure for established Tribal Air Programs.
- ***Tribal Radon (SIRG) Grants*** – 4 Tribes are were awarded SIRG Radon grants in FY20 totaling $120,000 with two year budget periods. All SIRG grants were incorporated into PPGs to reduce the match (25-40%) requirement to 5%. Multiple other Tribes are utilizing their GAP, Tribal or other funding source to implement radon outreach, testing and mitigation projects.
- ***Indoor Air Quality*** – Multiple Tribes across EPA R5 do IAQ work via: CAA 103/105 STAG, TOSCA, SIRG, GAP, and OECA EJ funding sources to implement a wide range of IAQ projects.
- *At the time of publication, our Region 5 Tribes are planning for the influx of funds through the American Rescue Plan and bipartisan infrastructure law to advance Tribal air and capacity in Indian Country.*

Federal Websites

Center of Disease Control, Covid-19 Information
- https://www.cdc.gov/coronavirus/2019-ncov/index.html

Environmental Protection Agency, Indoor Air Quality Information
- https://www.epa.gov/indoor-air-quality-iaq

Environmental Protection Agency, Ambient Monitoring Technology Information Center (AMTIC)
- https://www.epa.gov/amtic

Air Now
- https://www.airnow.gov/

USFS Story Map
- https://usfs.maps.arcgis.com/apps/Cascade/index.html?appid=11f32c35521642559258fc43f524fb7b

State Websites

Michigan - Michigan Department of Environment Great Lakes and Energy (EGLE)

Main EGLE Air Site
- https://www.michigan.gov/egle/0,9429,7-135-3310---,00.html

EGLE Air Permits
- https://www.deq.state.mi.us/aps/downloads/rop/ROPlist/APS_ROP_Sources_by_Name.pdf

EGLE Air Division Contacts
- https://www.michigan.gov/documents/Phone_List_by_unit_86621_7.pdf

Wisconsin — Wisconsin Department of Natural Resources (WDNR)

Wisconsin current AQ/forecasts, monitoring, AQ trends, open burning, AQ news, permits, emissions, contacts
- https://dnr.wisconsin.gov/topic/AirQuality

Wisconsin Air Pollution Control Rules
- https://dnr.wisconsin.gov/topic/AirQuality/Rules.html

Minnesota - Minnesota Pollution Control Agency (MPCA)

MPCA main page
- https://www.pca.state.mn.us/

MPCA air data and tools
- https://www.pca.state.mn.us/air/data-and-tools

MPCA air permits
- https://www.pca.state.mn.us/air/air-permits

MPCA Tribal
- https://mn.gov/portal/government/tribal/mn-indian-tribes/

Indian Country Websites

National Tribal Air Association
- https://www.ntaatribalair.org/

Tribal Air Monitoring Support Center
- http://www7.nau.edu/itep/main/tams/

Institute of Tribal Environmental Professionals
- http://www7.nau.edu/itep/main/Home/

Midwest Tribal Energy Resources Association
- MTERA.org

Tribes in EPA R5 are engaged in and serve on a wide variety of Regional and National Workgroups/Committees

National/Regional Committees:

- Clean Air Act Advisory Committee (CAAAC) – EPA R5 Tribal Representative
- Tribal Air Monitoring Support Center (TAMS) – 2 Steering Committee Representatives
- National Tribal Air Association (NTAA) – 2 R5 Tribal Reps, Vice Chair of Executive Committee
- National Radon Action Plan (NRAP) –Committee Member and NTAA Representative
- Conference of Radiation Control Program Directors (CRCPD) E-25 Committee Member
- National Tribal Science Council – EPA R5 Representative
- National Tribal Operations Committee (NTOC) –R5 Tribal Representatives
- Regional Tribal Operations Committee (RTOC) – Made of R5 Tribes, two from each state plus alternate
- LADCO- Technical Committee involvement
- Multiple R5 Tribes serving as ITEP instructors, sharing peer to peer information with other Tribes
- VW Tribal Advisory Council – R5 Tribal Representative
- Midwest Tribal Energy Resource Association (MTERA) – Members serving MN, WI and MI Tribes

Workgroups:

- RTOC R5 Tribal and EPA Mining Workgroup
- RTOC Climate Change Workgroup
- RTOC GAP Workgroup
- NTAA Indoor Air Quality Workgroup
- NTAA Mobile Sources (formerly the VW Diesel) Workgroup
- NTAA Woodstove Workgroup

Regional and National Meetings:

- EPA R5 Tribal Air Meeting – at the R5 Tribal Environmental Program Managers (TEPM) meeting
- EPA R5 Tribal monthly air media conference calls
- Monthly NTAA-EPA-Tribal policy calls
- Multiple EPA-Tribal consultation calls
- Minnesota Tribal Mining Meetings with Minnesota Pollution Control Agency and Division of Natural Resources
- Minnesota Technical Staff Environmental Council (MNTEC) - meet monthly
  mntechhomepage.wixsite.com/mysite/about
- Michigan Tribal Environmental Group (MTEG)
- Wisconsin Tribal Conservation Advisory Council (WTCAC)
- National Tribal Forum on Air Quality – R5 Tribes on planning committee, attend and present

Please refer to the documents below for individual Tribal contacts and information sharing:

- *R5 Tribal Areas of Interest document for permits for input on TV and mNSR permits*
- *Tribal National, Regional and Local Workgroup Involvement List*
- *Minnesota Tribal Climate Change Project Inventory*

For copies please contact: *Brandy Toft brandy.toft@llojibwe.net 218.335.7429*
Robin Bouschor rbouschor1@saulttribe.net 906.632.5575

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Tribe Finder

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Acronyms

CAA	Clean Air Act
CAA 103	Clean Air Act Section 103 Funding
CAA 105	Clean Air Act Section 105 Funding
CO	Carbon Monoxide
CO_2	Carbon Dioxide
EI	Emissions Inventory
EJ	Environmental Justice
EPA R5 (R5)	Environmental Protection Agency - Region 5
ETS	Environmental Tobacco Smoke
GAP	General Assistance Program
Hg	Mercury
HUD	Housing and Urban Development
HVAC	Heating, Ventilation and Air Conditioning
IAQ	Indoor Air Quality
ITEP	Institute for Tribal Environmental Professionals
Met	Meteorology; Meteorological Station/Tower
MTERA	Midwest Tribal Energy Resources Association
MPCA	Minnesota Pollution Control Agency
NAAQS	National Ambient Air Quality Standard
NADP	National Atmospheric Deposition Program
NO_X	Oxides of Nitrogen
MNSR	Minor New Source Review
NSR	New Source Review
NTAA	National Tribal Air Association
NTN	National Trends Network
O_3	Ozone
pCi/L	Picocuries per liter for radon measurement
PM	Particulate Matter
PM_{10}	Particulate Matter with a diameter of less than 10 micrometers
$PM_{2.5}$	Particulate Matter with a diameter of less than 2.5 micrometers
ppm	Parts per million
PSD	Prevention of Significant Deterioration
Rn	Radon
RPO	Regional Air Planning Organization
SIRG	State and Tribal Indoor Radon Grants
SO_2	Sulfur Dioxide
TAS	Treatment as a State
TSP	Total Suspended Particulates
TAMS	Tribal Air Monitoring Support Center
VOC	Volatile Organic Compounds
VW	Volkswagen Settlement

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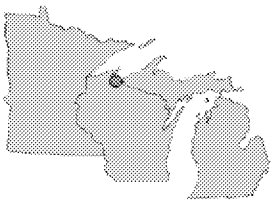


Bad River Band of Lake Superior Chippewa

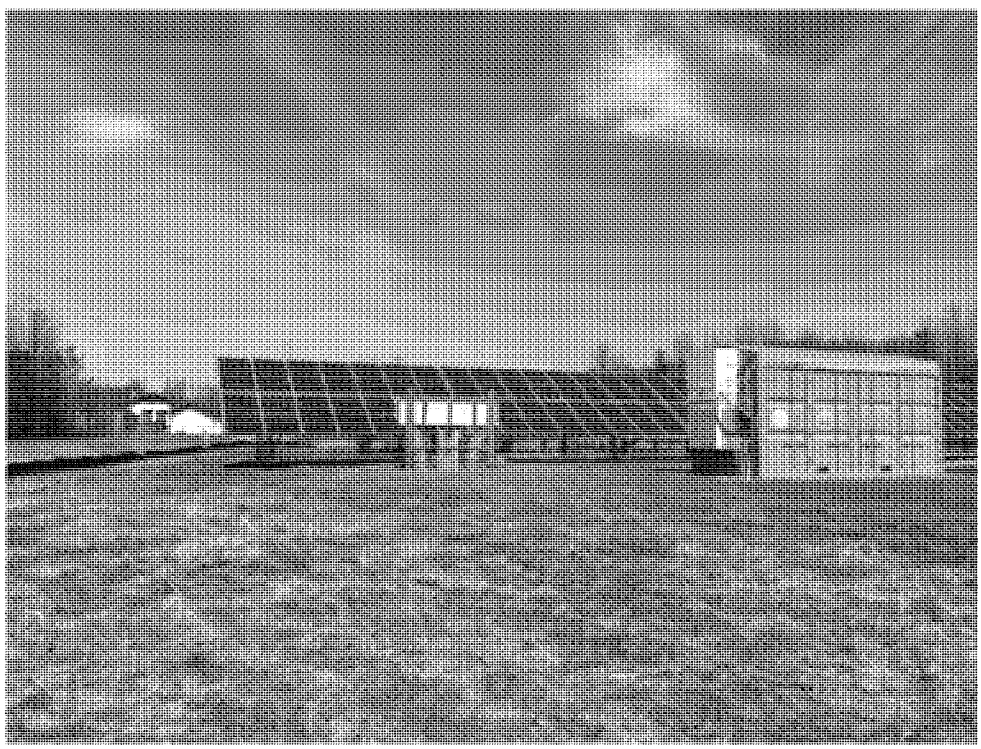
Nathan Kilger, Air Quality Specialist
Daniel Wiggins Jr., Air Quality Technician
Program in Existence since – 2001
Program Projects – $PM_{2.5}$, O_3, Hg, Met, Rn, IAQ, Solar
Location – Odanah, WI

The Bad River Band started an Air Program in 2001 to fulfill the Bad River Natural Resource Department's mission of protecting and conserving the natural resources, maintaining ecosystem integrity, and managing the natural resources for future generations. The water and air quality of the entire Bad River watershed is a priority and Bad River's Air Office works to fulfill those goals.

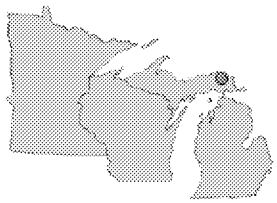
Bad River continues to focus on both ambient and indoor air quality. COVID-19 has affected many air-related activities of the Band's Air Office; indoor air and radon assessments were made difficult with COVID-19, however the Band's Air Office continues to offer services within the boundaries of COVID protocols and restrictions.

The Band was able to commission the three Ishkonige Nawadide Solar Microgrids, executed through a Department of Energy (DOE) Office of Indian Energy grant. Through this project the Band installed over 500 kW of solar photovoltaic production with over 1000 kWh of battery storage at three Tribal facilities. The systems at the Health & Wellness Center and the Wastewater Treatment Plant will offset each facility's electrical loads and offer a level of resiliency if power goes out that could last weeks.

The microgrids were commissioned in May and have provided actual savings over $31,000 over the last six months of operation. The Band's Air Office will continue to work with the Band's Renewable Energy Team to accomplish energy goals, specifically those that encourage cleaner energy.



One of the three Tribal facilities, the new solar array installation, and the battery storage (gray metal box in the foreground) linking the array and the facility.



Bay Mills Indian Community

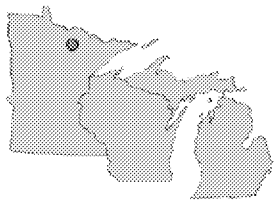
Vacant Position-Gap Coordinator
Program in Existence since – 1991
Program Projects –IAQ, Radon
Location – Brimley, MI

Gnoozhekaaning (the place of the pike) is the traditional name given to the Bay Mills Indian Community (BMIC) by local Ojibwe. Bay Mills resides on a narrow strip of land on Lake Superior's shores. In past years, BMIC has collaborated with the Inter-Tribal Council of Michigan, Inc. (ITCMI) with the primary focus of implementing the GAP program to improve air quality on the Reservation.

Currently, BMIC has GAP funding. However, due to staff turnover, the position that handles air quality is currently vacant. There are challenges in filling the position as it is part time position and considerable effort is required to have a new staff attain Certified Radon Specialist. Several options for filling the position to move air quality work forward are being considered. It is a priority to work on improving clean air within the Reservation, creating an interest in the community and opportunity for sustainability of the Program for future generations.

Past work in collaboration with ITCMI has included radon testing all homes within the BMIC Housing Authority to identify structures that require mitigation and ensure families with radon mitigation systems already in place continue to function. Due to the COVID 19 pandemic, this work was not able to be performed this past year. Plans for the future are to continue to build upon the relationship with BMIC Housing Authority to ensure residents have good IAQ, free of radon. Future goals are to expand testing to the fifteen Tribal service buildings and four enterprise locations, serving as the Reservation's primary employment centers. Enterprise alone employs over 700 staff members who spend 8 hours a day, 365 days a year within the buildings they work.

Bay Mills Indian Community's population is growing at a rate of 5-10% annually. Future housing developments are on the horizon to accommodate this growth within the Reservation boundaries. The concern is that 12% of homes in Chippewa County where the Tribe resides have radon levels above 4pCi/L. Plans are to take action before the houses are built and work with Tribal Council to ensure that "all" new homes and structures constructed within the Reservation boundaries have a Radon Resistant New Construction mitigation system already in place before habitation occurs. This goal will be a step in ensuring the health and safety of future Tribal residences and take steps to implement the right to breathe clean air.



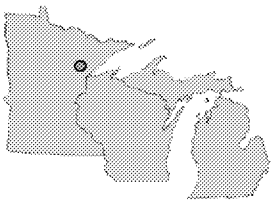
Bois Forte band of Chippewa

Chris Holm -Environmental Department
Program in Existence since – 2002
Program Projects –IAQ, Asthma Awareness, Climate Change
Location – Nett lake and vermillion (Tower), MN

Bois Forte Band of Ojibwe (Band) has issued and implemented a very serious, and largely comprehensive approach to assure community safety and security during the COVID pandemic. In March 2020, Bois Forte established a Tribal Emergency Response Committee (TERC), comprised of elected Tribal Council Members, Health Officers, Department Directors, Law Enforcement and Emergency Operations personnel, and Communications personnel to devise and implement COVID safety plans. The TERC was instrumental early in finding and obtaining essential COVID testing equipment and supplies to test and inform community members. The TERC continues to meet on a frequent basis and reviews safety plans and implementation; devises and directs funding plans and processes being carried out with federal CARES Act funding, organizes food and safety supplies chains and distribution networks for community households, studies national and local trends and communicates COVID warnings, and ensures fast treatment and proper quarantining processes for affected individuals.

Bois Forte is developing research plans to evaluate climate change through evaluation of nutrient deposition and distribution pathways in aquatic systems. Climate change and warming trends are considered likely to enhance or alter vegetation and aquatic consumer growth and distribution patterns, and may change rates, physical paths and sinks of senescent vegetation nutrients redistributed in lakes and wetlands. This type of evaluation is inherently complicated by the fact that large-scale comparative evaluations, necessary to reference and validate field studies of this type, are only recently becoming available. Pending availability of funding, Bois Forte is prepared to begin basic evaluations of wild rice plant decomposition rates, aquatic macroinvertebrate community distribution and feeding affect, and will begin the process of statistically correlating biological findings with water quality metrics, which the Band has compiled for many years.

Due to lack of trained personnel and limited EPA funding, Bois Forte Division of Natural Resources does not have an active Air Program and is not presently performing air quality evaluations. This is a change from our previous status as an Indoor Air Quality Center of Excellence. However, with decreased funds and staff turnover, Bois Forte's capacity was diminished not only for Band but for the Tribes we assisted with IAQ assistance, training and equipment sharing.



Fond du Lac Band of Lake Superior Chippewa

Anthony Mazzini – Air Quality Technician
Phil Defoe – Air Quality Technician
Program in Existence Since - 2004
Program Projects –TV permit review, Diesel, $PM_{2.5}$, Hg, Sensors
Location – near Cloquet, MN

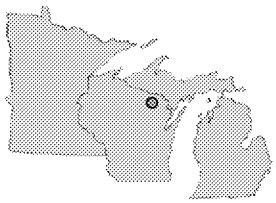
The Fond du Lac Band of Lake Superior Chippewa was the first Tribe in EPA R5 to have a dedicated Air Program and in 2004 became the first to be granted Tribal Authority to administer parts of the CAA. The Band uses this status to receive advance notice of permit issuance from the Minnesota Pollution Control Agency. The Program provides the Band with expertise on environmental issues related to air quality. In order to protect Fond du Lac resources, the Band reviews and provides feedback on draft permits and regulatory actions and provides education and outreach to Band members. The Band has been able to develop its Program, assert its sovereignty, and achieve excellent working relationships with Minnesota and Wisconsin permitting agencies, as well as with EPA R5.

In order to assess the effects of air pollution on the Reservation, the Air Program operates an ozone monitor, a $PM_{2.5}$ continuous monitor, and a mercury wet deposition monitor. Data on leaf litter mercury dry deposition has been collected for nine field seasons to date. The goal is for this data to assist in helping the scientific community study and predict the fate of mercury emissions in the environment and evaluate water quality in the area, as well as determine the effectiveness of mercury controls. A Purple Air sensor was recently installed to help track pollutants from wildfire smoke across the state.

In 2019 and 2020, the Band received awards in three rounds of VW Settlement funds, with fourth round funding expected in late 2021. The majority of these funds were used to replace older diesel heavy vehicles and install electric vehicle charging stations at three different locations on the Reservation. One of these locations, the Black Bear Casino Resort, is an important one as it fills a gap in the state's network of stations.

The Band continues to address indoor air quality issues as they arise, as well as reviewing and commenting on proposed permits and regulatory actions. The Fond du Lac Air Program will go into 2022 with new staff in both the Air Program Coordinator and the Air Quality Technician positions.

PM reductions with offroad diesel retrofit



Forest County Potawatomi Community

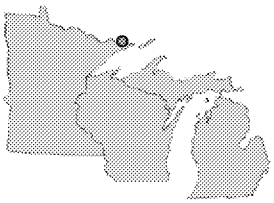
Natalene Cummings – Air Quality Program Manager
Joe Cebe – Air Quality Specialist
Program in Existence since – 2002
Program Projects – O_3, SO_2, $PM_{2.5}$, Acid & Hg deposition, Litterfall, MET, & IMPROVE
Location – Crandon, Forest County, Northeastern Wisconsin

The FCPC's Ambient Air Monitoring Program is 20 years old in 2022! With modest beginnings, the Tribe began gathering air pollution data to establish a baseline of air quality within the region in support of its 1994 application to EPA for Class I designation under the Clean Air Act. The Program started with O3 and SO2 analyzers for gaseous pollutants, and TSP and PM10 collectors for particulate pollution, based on EPAs recommendations for rural monitoring sites. In 2004, FCPC partnered with the Wisconsin Department of Natural Resources to facilitate mutual support, technical assistance and data sharing that continues to provide high quality data used to determine regional pollution trends and attainment of the NAAQS for both FCPC lands and neighboring counties within the State. In 2005, FCPC's concern for high Hg levels in fish consumed by its members facilitated participation in the NADP MDN and NTN national networks to gather data on acid and mercury deposition on Tribal lands and in waters. And, following EPA's official 2008 designation of FCPC's lands as Class I, FCPC partnered with the Interagency Monitoring of Protected Visual Environments (IMPROVE) network in 2017 to collect data on "visibility", an Air Quality Related Value (AQRV) identified by FCPC under its Class I authorities.

In addition to visibility, the Tribe formally specified water quality, aquatic systems and vegetation as AQRVs and established pollutant thresholds for each that must not be exceeded by any proposed new "major" pollution emitting facility, ensuring adequate emission controls are in place to protect FCPC's resources.

The success and accomplishments of FCPC's Air Quality Program were and continue to be possible through grants provided by EPA, including GAP, CAA 103 and 105, and the Multipurpose Grant. More recently, with CAA 103 funds, FCPC completed a study conducted in partnership with the US Forest Service - Northern Research Station, to observe impacts of various ozone concentrations on common herbaceous plants utilized by Tribal members for subsistence and cultural activities. This study supports the vegetation AQRV threshold for ozone defined by FCPC under its Class I authorities and assures these important plants are protected from elevated ozone levels. Consistent funding from one year to the next is crucial to Tribal Air Program successes, as are steady increases from year-to-year to enable Tribes to build on their capacity and expertise, and to provide funding for others to initiate air programs.

US Forest Service Research Scientist and FCPC Botanist partners provide tour of study plants in greenhouse to EPA R5.



Grand Portage Band of Chippewa

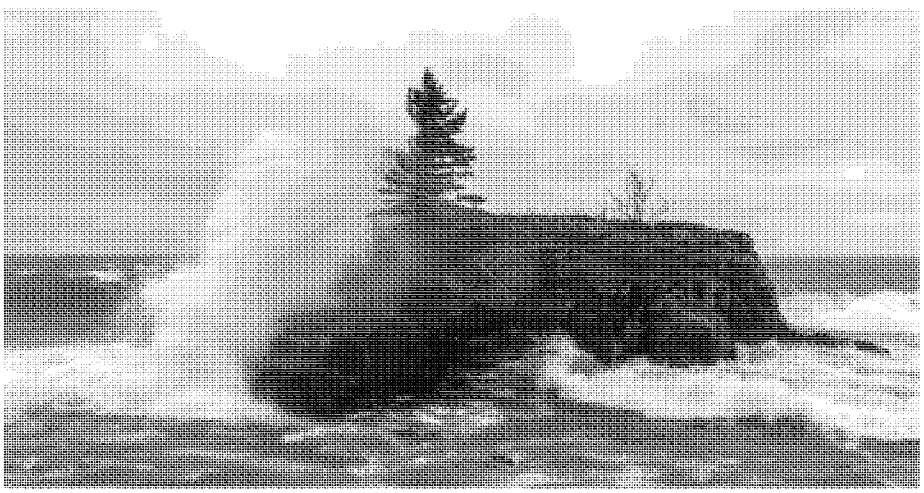
Vallen Cook – Air Quality Specialist
Program in Existence since – 2003
Program Projects – $PM_{2.5}$, IAQ, Asthma, Hg, Regional Haze, Renewable Energy, Enviro Education, Climate Change, Permit Review
Location – Grand Portage, MN

The Grand Portage Band of Chippewa Reservation is located in the most northeast point of Minnesota. We have had an established Air Program since 2003. Our focus has been on ambient air monitoring, indoor air quality, environmental education, and regional haze. In 2017 we attained TAS status for our Program. We are looking towards Class I Designation for our air shed in the coming years. For the time being, the Grand Portage Air Quality Specialist has been gathering data to complete an Emissions Inventory.

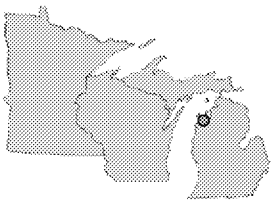
The effects of COVID-19 on Grand Portage's Air Program are still lingering, like other reservations have had a longer-term impact. Usually, our most significant issue for us is Indoor Air Quality. Tribal members are still hesitant to let outsiders into their homes even with proper PPE, so engagement and assessments have been very low. Another issue occurring is the number of days during the summer in which we had to issue air advisories from wildfires out west. We had a few days in August and September 2021 where the Air Quality index ranged from unhealthy for sensitive groups (101-150, orange) to unhealthy (151-200, red). Grand Portage usually only has one to two days of unhealthy for sensitive groups (101-150, orange); this is the first time in a long while data-wise, we hit consecutive days of unhealthy air (151-200, red).

Adjusting to working from home has been an interesting transition as most of the staff within the Department, aside from those who have fieldwork, predominantly opt to work from home. For the time being, many face-to-face conferences and meetings have been held virtually. There is a consensus that meeting with people face-to-face is missed by many. Talking to a screen degrades the experience of talking to a person. It's great that the technology has progressed to a point where we can have virtually meetings, but it is not the same.

We continue to be very involved in the Tribal Air Monitoring Center (TAMS) steering committee. Our Air Quality Specialist was voted in as Chairman of the TAMS steering committee and the liaison between TAMS and the National Tribal Air Association.



Hollow Rock in Lake Superior on Grand Portage Reservation



Grand Traverse Band of Ottawa & Chippewa Indians

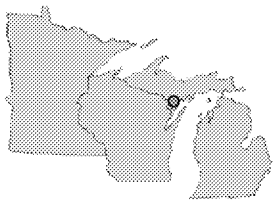
Jenna Scheub– Environmental Services Coordinator
Program in Existence from 2002 to 2010
Former Program Projects – Ozone, IAQ Inspections, Hg Deposition, EI, Diesel Retrofit, NADP Monitoring, Rn, Burn Barrels , Residential Mold, and Educational Outreach.
Location – Peshawbestown, Michigan

The Grand Traverse Band of Ottawa & Chippewa Indians (GTB) headquarters in Peshawbestown Michigan; the northern part of Michigan's lower peninsula. GTB's Natural Resource Department Environmental Program was established on October 1, 1997 through grant funding from EPA and has grown to include programs for: solid waste management, pollution prevention, watershed planning, great lakes management planning, environmental health, groundwater and surface water quality protection, seventh generation initiative program, wetland protection, nonpoint source pollution, soil erosion permitting, CERCLA Section 128A (brownfields, Phase 1 contamination surveys, environmental response), and a green team. GTB's Environmental Program strives to restore and protect the natural systems upon which life depends. This includes the integral relationship between natural systems and the health and welfare of GTB members in the 1855 Treaty Reservation area, and arguably the 1836 Treaty Reservation area in the Ceded Territory. This mission is consistent with the GTB Constitution which states, in part, that the Constitution was adopted "to conserve and develop our natural resources."

GTB established an Air Quality Program under the Clean Air Act (CAA) Section 103 grant funding in 2002. The Air Quality Program began with National Atmospheric Deposition Program (NADP) Monitoring. During its eight years of existence, the Program added ozone monitoring, household radon testing, indoor air quality inspections of Tribal residences and governmental offices, mercury deposition monitoring, emissions inventories, diesel retrofit training, creation of a burn ban ordinance, and educational outreach to the Tribal membership and the local public. The GTB Air Quality Program partnered with the Michigan Environment, Great Lakes & Energy, NADP staff, Inter-Tribal Council of Michigan, and. EPA. In 2009, GTB attempted to secure Treatment as a State (TAS) and CAA Section 105 funding. GTB had to discontinue its Air Quality Program in 2011 due to the loss of funding under the CAA Section 103. Although, GTB re-affirmed air quality as a Tribal priority in the 2019-2023 EPA - Tribal Environmental Plan. In support of the importance of Air Quality and other Tribal programs, GTB is working to provide helpful input on air quality to other regional Tribes.

For further information, please visit our websites:
http://www.gtbindians.org/default.asp
http://www.gtbindians.org/naturalresources.asp
http://www.gtbindians.org/environmental.asp

GTB NRD Mission: To protect and enhance the natural resources and environment entrusted to us by the Creator & guaranteed by treaty rights, for managed & respected utilization by the Anishinabek people for past, present, and future generations.



Hannahville Indian Community

Mike Shuster –Environmental Services Coordinator
Program in Existence since-1993
Program Projects – IAQ Education, Tire Disposal, Rn Testing
Location – Wilson, Michigan

Hannahville Indian Community (HIC) is a federally recognized Indian Tribe located in the south-central portion of Michigan's Upper Peninsula. The Reservation of HIC is composed of 5,800 acres. The Community has 990 enrolled members, 760 of which live within the borders of the Reservation. HIC established Hannahville Environmental Protections Program (HEPP) in 1993, with a main focus on surface water quality, solid waste disposal, recycling, environmental impact assessments, and assisting the community with best land management practices.

Although HIC does not currently have an air grant through the EPA, the HEPP have committed to air-related activities among the Reservation through GAP funding. The primary focus within the air portion of the GAP Program is radon testing in governmental buildings and Tribal residences. The Reservation, which is mostly located in Menominee County, is an area of moderate potential for radon levels above the EPA action level of 4.0 pCi/L. Due to this potential, HEPP continues to inform the Tribal Community about the negative effects of radon and keeps AirChek radon test kits in stock for HIC members.

Continued support of the Tribe in providing solid waste disposal for their residences in the form of curbside pickup and a solid waste transfer station, has deterred backyard burning of garbage. The burning of garbage is a popular way of disposing of solid waste, especially in the rural areas of the Upper Peninsula. With this, the Tribe has supported proper disposal of tires by allowing Tribal members to drop off their personal used tires to avoid improper disposal and to prevent any burning of tires. In 2021, many improperly disposed tires were discovered within the Reservation and through a grant partnership with the Lake Superior Watershed group and Michigan's EGLE the tires were cleaned up and disposed of properly. In the end, over 1,300 tires were recovered.

Hannahville Indian Community

KEEPER of the FIRE

POTOWATOMI

Visit our website at www.hannahville.net

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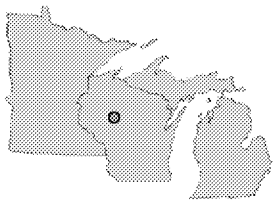

Ho-Chunk Nation

Matt Malimanek, Air Quality Specialist
Program in Existence since – 2006
Program Projects – Ambient Air Monitoring, Rn, Asthma, & IAQ
Location – Black River Falls, WI

The Ho-Chunk Nation Ambient Air Monitoring Program continues to progress towards establishing a baseline of PM data near its communities. Significant improvements to the Nation's Air Monitoring QA/QC and data reporting process were made in 2021. Also, the Ho-Chunk Nation's air monitoring dataloggers each recently received operating system upgrades. Throughout the on-going Covid-19 pandemic, the Nation's ambient air monitoring efforts were able to proceed as originally planned.

On the Indoor Air Quality side of things, the Ho-Chunk Nation's Air Quality Program has begun to observe an increase in Tribal Member requests for mold investigations, radon testing, and indoor air quality assessments, since the pandemic first began. The Nation has returned to utilizing on-site visits to conduct home assessments for the requests that have been received.

The Ho-Chunk Nation is very close to completing the drafting of its Clean Air Act "Treatment as State (TAS)" application. The Nation plans to submit the application to the EPA by March 2022. Upon completion of the application and approval of the Nation's TAS status, the Air Quality Program will begin to apply for Clean Air Act Section 105 project funding.

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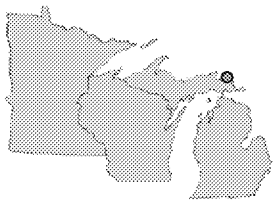

Inter-Tribal Council of Michigan, Inc. (ITCMI)

Anthony Rinna, Environmental Specialist
Bill Bernier, Registered Sanitarian
Program in Existence since – 2000
Program Projects – IAQ, Radon
Location – Sault Ste. Marie, MI

Inter-Tribal Inter-Tribal Council of Michigan, Inc. (ITCMI) has provided support for member Tribes in regards to air quality since 2000. These activities have involved individual and collections of Tribes as well as cooperation with state and federal partners.

Past activities performed by ITCMI staff include individual indoor air quality assessments through contract services, ambient air monitoring, and radon testing of individual residences and of multi-family dwellings.

Indoor air quality assessments are currently provided to Michigan Tribes through contracted sanitarian and environmental health services at ITCMI. Assessment requests have ranged from the investigation of air quality in family homes to the investigation of air quality and weatherization effectiveness of large facilities. ITCMI has IAQ trained personnel and a wide range of IAQ equipment to assist Tribes with their specific IAQ needs.

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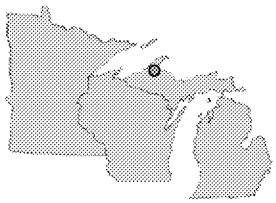


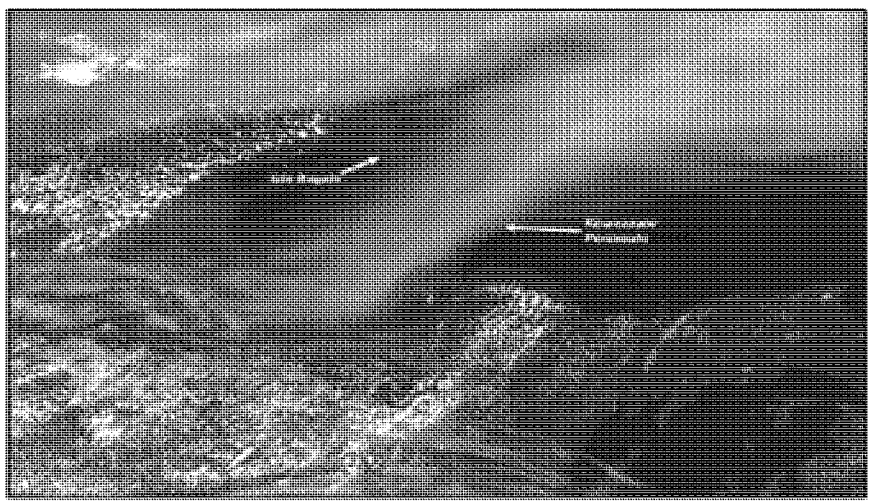
Keweenaw Bay Indian Community

Location - L'Anse/Baraga, Michigan
Jane Kahkonen - Air Quality Specialist
Program in Existence since - 2012
Program Projects - Indoor and Ambient Air Quality, Rn, Education, Outreach, Air Sensor Monitoring, and Local/National CAA Issues

The Keweenaw Bay Indian Community (KBIC) is located in the Upper Peninsula of Michigan in a rural area on the shores of Lake Superior within the Ceded Territory of 1842. The Reservation encompasses over 55,000 acres, 17 miles of Lake Superior shoreline, 80 miles of streams and rivers, 15,000 acres of lakes, and 3,000 acres of wetlands. KBIC has a progressive Natural Resources Department (NRD) that is responsible for the protection, preservation, and enhancement of our local resources. These include mitigation of all environmental concerns that affect our health, culture, and lifeways. Protecting local air quality is an important component in maintaining the rights that we hold to enjoy the sacred land where we live, subsist, and honor our history.

During FY2021, the KBIC Air Quality Program (AQP) was administered under the KBIC PPG with EPA CAA Section 105 and SIRG Radon funding. KBIC has made steady progress building its AQP capacity to provide air quality services through TAS implementation, radon testing, home assessments, open burning enforcement, new and renewal air permit reviews and CAA commenting, Tribal energy program assistance, and educational outreach. Current projects include the deployment of multiple air sensors for obtaining baseline PM2.5 data and an EJ exposure assessment study of atmospheric contaminants from legacy and active point sources on and adjacent to the KBIC Reservation. Although COVID has changed the way we carry out many of our AQP activities, we continue to adapt with health and safety protocols in place.

Year to year, the KBIC AQP continues to expand with the additions of climate change, energy, wildfire smoke, and PFAS issues. While trying to maintain the work we already perform, we find that the appropriate funding to not only sustain but to advance our CAA program goals is difficult to obtain. The burden of writing multiple grants, mostly competitive, to fill key program positions requires valuable administrative time. It is our view that when a Tribe can establish a meaningful and active AQP with the EPA, that appropriate funding for staff should systematically be guaranteed and supplied to sustain those programs. CAA 103 project funds should not be the means to augment key staffing positions within established air programs. R5 Tribal budget proposals are often and notoriously slashed from original proposal budget requests. We look forward to 2022 and how these disparities can be addressed within our Tribal Air Programs in R5.



Wildfire Smoke over the Keweenaw Peninsula – July 2021 (NASA photo)

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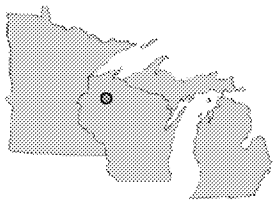

Lac Courte Oreilles Band of Lake Superior Chippewa
Brett McConnell – Environmental Specialist
Program In Existence – 2000-2005
Program Projects – Radon Monitoring/Mitigation, NADP Network, Mold
Location – Northwest, Wiconsin

Due to Covid and staffing issues the Lac Courte Oreilles was unable to be reached for a submission. This highlights the fragility of Tribal programs when staffing and capacity building is sidelined by an outside stressor such as Covid.

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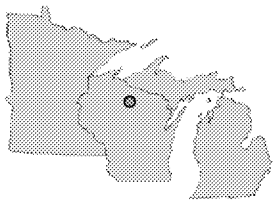


Lac du Flambeau Band of Lake Superior Chippewa-Waswagoning

Dee Ann Allen-Environmental Program Manager

Program in Existence - 2008

Program Projects – Climate Change Resiliency, IAQ, Energy Upgrades, Solid Waste Recycling, COVID-19 Incident Command, Education and Outreach

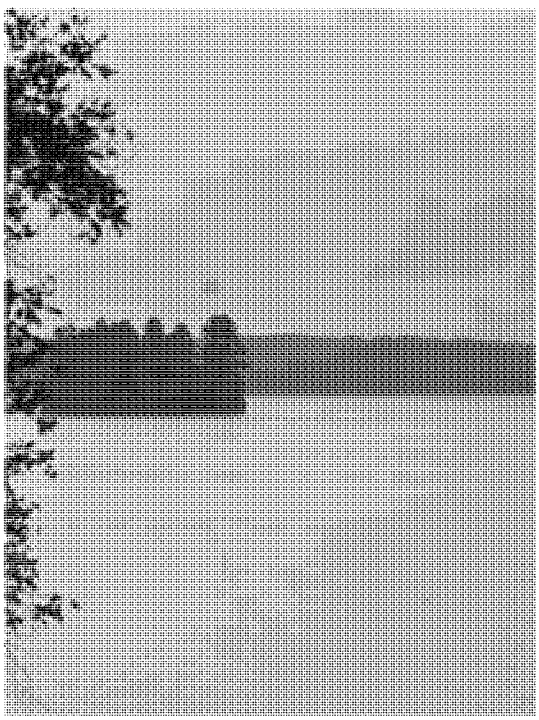
Location -Lac du Flambeau, Wisconsin

Throughout the Covid-19 pandemic our Tribe utilized initiatives within our Climate Change Resiliency/Pre-Hazard Mitigation plan to address many of the concerns related to this outbreak. Part of the plan addressed community health outbreaks. The Incident Command Team and Tribal Council-Administration were more prepared to implement and take the necessary actions needed to minimize the impacts to our community. Outstanding needs for air quality funding and communication outreach remain.

The Tribal Natural Resource Department continues to use Traditional Ecological Knowledge (TEK) in all natural resource planning. An example of this planning effort is the Tribe's Climate Resilience Initiative that includes Energy Reduction Plan, Climate Assessment and Adaptation Plans, as well as Hazard Mitigation Planning. TEK is incorporated into these plans which are publicly available at www.ldfclimateresilience.org.

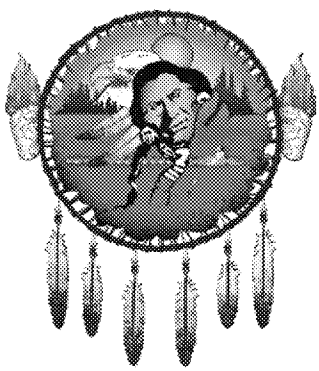
The COVID-19 pandemic heightened indoor air quality concerns impacting households and Tribal facilities such as tobacco, synthetic drug, meth, wood smoke, mold and poor ventilation issues. The practice of utilizing lead and varnishes for fish decoys is a concern. There is a need to provide funding for outreach, education, and alternatives to address these issues and for mitigation of impacted homes. On a good note; the COVID safety measures at our Tribal Casino has led to a smoke free gaming facility.

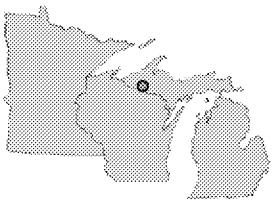
Air Quality Protections are needed for direct air pollution, depositional pollution into the environment, air quality degradation, and cumulative pollution effects. These threats are impacting Ceded Territory treaty reserved resources both within the Reservation and within the Ceded Territory. One of those threats in recent years is the increase of UTV/ATV trail dust clouds in sensitive environments. Air quality evaluations and planning in advance of new trails is urgently needed both on Reservation and within Ceded Territory.



The resources available for Air Program projects and implementation are limited. The Tribe lacks a current air quality cooperative agreement grant. The available funding resources do not cover an FTE staff position, proving a challenge to air program development. In addition, existing Natural Resource Staff and programs were stretched to provide increased services during the COVID 19 pandemic resulting in less staff time available for air program development.

July 15 2021 Sunrise over Pokegama Lake – air quality affected by wildfire smoke





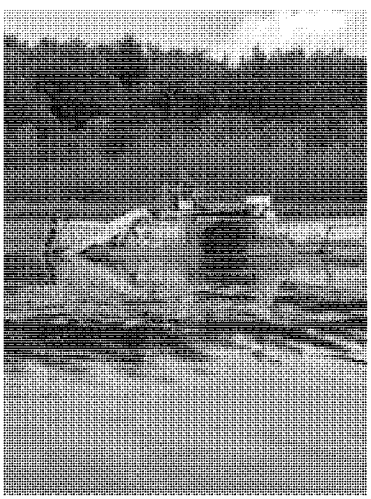
Lac Vieux Desert Band of Lake Superior Chippewa Indians

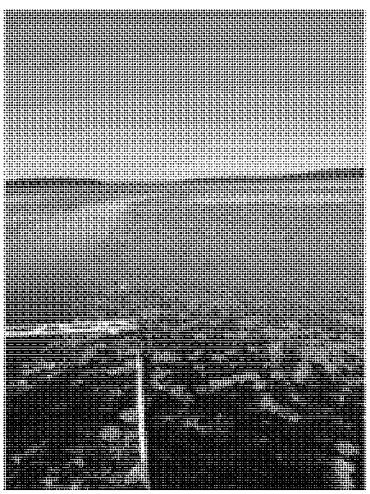
Beth Schrader – Environmental Officer
Program in Existence – No formal program
Program Projects – IAQ
Location – Watersmeet, MI

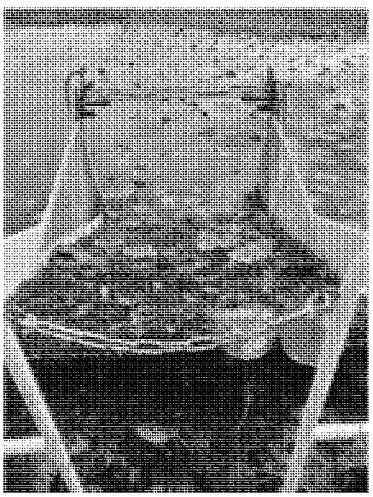
The Lac Vieux Desert Band of Lake Superior Chippewa Indians is a federally recognized Indian Tribe located in the Upper Peninsula of Michigan, near the Wisconsin boarder. Lac Vieux Desert has 749 enrolled members. The Reservation is composed of 1140 acres of fee land and 339 acre held in trust by the United States Government for the community. The 9-member council is an elected body, whom is selected through the election process to govern the Tribe.

The Lac Vieux Desert Band has had a difficult time getting members on board with having air inspections done on their homes. Since the courses were completed for both level 1 and level 2, only a handful of inspections have been complete. With that being said, it was decided to shift our efforts to the water.

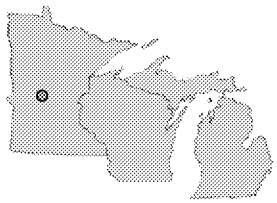
More research is being done to help restore our wild rice beds. There has not been a crop on Lake Lac Vieux Desert since 2012. An eco-harvester is currently being used to help clear the vegetation in the rice beds with the hopes that is will allow the rice to grow without the competing vegetation.







Pictures of a Tribal council member operating the weed harvester on Lake Lac Vieux Desert and then paths they leave.



Leech Lake Band of Ojibwe

Carma Huseby – Air Quality Specialist Brandy Toft – Environmental Dep Dir
Program in Existence since – 2001
Program Projects – Hg (wet, litter, spec), IAQ, Met, $PM_{2.5}$, Rn, Diesel, Toxics, Solar, Permits/Rules, Mining, Sustainability, Forecasting, MTERA
Location – north central Minnesota, HQ located in Cass Lake, MN

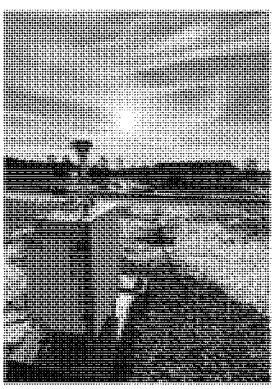
The Leech Lake Band of Ojibwe (LLBO) continues to build program capacity, develop and enhance its Air Quality Program (LLAP) to protect human health, cultural and trust resources in the Reservation's 865,000 acres.

Leech Lake's goals for sustainability continues with 5 current and 14 additional proposed EV chargers, 260 Kws of solar PV, of which 200 Kw serves low income households, and a multiyear 22 building Guaranteed Energy Savings Project that will provide $276,000 in energy savings and reduce 2,030 metric tons of GHG emissions per year. A solar strategy plan, a Climate Adaptation Framework and a Sustainability Strategic plan were completed with a Climate Change Adaptation Plan in process. These efforts and sustainability actions we established include guidances: Approaching Net Zero, Building Solar Ready and Electric Vehicle Infrastructure and Procurement.

The LLAP operates ambient air monitoring sites for Hg (wet deposition), BAM 1020 $PM_{2.5}$ and meteorology. The LLAP has updated the meteorological equipment to the newest models, replacing the original equipment purchased in 2003. LLAP' BAM is integrated into the State of Minnesota's PQAO and Air Forecasting Networks http://www.smogwatch.com/minn/realtimedata.cfm http://www.pca.state.mn.us/air/current-air-quality This provides Tribal members with real time information to allow them to make better health choices based on the Air Quality forecast. Collaboration with the MPCA and EPA has been beneficial for both entities. MPCA has provided technical assistance, remote data collection and QA/QC. The LLAP is currently working with MPCA to upgrade our BAM1020 $PM_{2.5}$ monitor to the, new state network, Teledyne $PM_{2.5}$ monitor. The LLAP also has a BloomSky camera collocated with the BAM which is a weather camera station that measures temperature, humidity, barometric pressure and precipitation. This also allows Tribal members to see live conditions and take precautions when PM levels are high. https://map.bloomsky.com/weather-stations/faBiuZWsnpapmKqr. The LLAP installing 4 Purple Air Sensors throughout the Reservation and joining the Purple Air Wildfire Smoke Management network with the State of Minnesota and USFS. In July, LL lead the nation in PM related to wildfires. LLAP's monitors provide data and fulfills a data gap that Leech Lake has had concerns about for years and is now acknowledged.

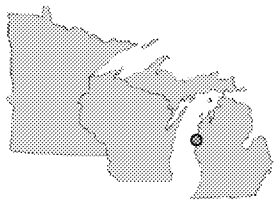
Other work in 2021 continues to protect and maintain LLBO's air quality as Leech Lake is surrounded by 24 Title V facilities of varying industries: coal fired EGUs, wood/paper, waste incinerators, natural gas compressor stations, and six iron ore mines clustered within or near our 1855 Ceded Territory. The LLR has approximately 68 minor sources that exist within the Reservation boundaries. We also have 7 functioning pipelines (5 oil and 2 natural gas) traversing the Reservation. With the review of environmental impact statements, Title V and minor permits on or near the Reservation it is important to understand the complexities of our airsheds and impacts upon them. LLBO received TAS for CAA 105, 505 2a in October 2007.

LLAP $PM_{2.5}$ monitor



LLAP is engaged on local, regional, and national venues {NTAA Vice-Chair, R5 RTOC Minnesota Representative, TAMS, NRAP, CRCPD, MTERA Chair} and shares that information in the form of data, education, and outreach to and for Indian Country.

The LLAP is funded by an Air Media PPG combining our 105 and Radon grants. The LLAP looks forward to building and expanding capacity to better serve LLBO, while working with partners to leverage resources and promote air quality issues in Indian Country. During Covid, Staff were deemed essential and were able to continue fieldwork while working from home for 15 months. This limited our work related Covid impacts and kept the LLAP serving the Tribal community.



Little River Band of Ottawa Indians
Corey A Wells – Air Quality Specialist
Allison Smart – Environmental Division Manager
Program in Existence - 2005
Program Projects - O_3, $PM_{2.5}$, MET
Location – Manistee, MI

Little River Band of Ottawa Indians (LRBOI) began its Air Quality program in September of 2005 with CAA 103 project funding. The Tribe was concerned that O3 transports up the Lake Michigan shoreline was adversely affecting air quality in Manistee County, Michigan. This transportation issue has been acknowledged and documented by the State of Michigan and the EPA. LRBOI continues to monitor ozone to gather additional information and to support trend analysis.

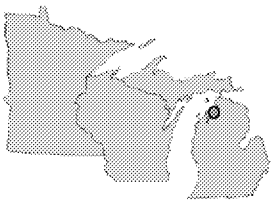
In addition to monitoring ozone, LRBOI also monitors $PM_{2.5}$ and meteorological data through the instrumentation at our air monitor station. LRBOI has an agreement with the State of Michigan for monitoring assistance, laboratory work and quality control. LRBOI is still in the process of pursuing Treatment as State (TAS) for CAA 105.

LRBOI has a renewed interest in analyzing the data (O3, $PM_{2.5}$ and MET) collected at our research station over the past decade to see if there are any developing trends. In addition, we are working on producing an updated Emissions Inventory. LRBOI still plans on expanding the Air Program to include an Indoor Air Quality (IAQ) Monitoring Program with an emphasis on mold and moisture detection and radon testing. We will be setting up IAQ monitors at government buildings and Tribal community centers so that a constant record of the IAQ of LRBOI's various buildings can be monitored and recorded. This system will also be available for citizens and employees to view once it can be integrated into LRBOI's IT system.

LRBOI is working with the EPA to set up a colocation shelter along side our $PM_{2.5}$ to house a variety of sensors that can be compared to our O3 and $PM_{2.5}$data to test for accuracy. These (relatively) inexpensive and smaller systems will then be set up at remote sites to monitor air quality and metrological data along the Reservation area in the Manistee River corridor. This summer we removed our old $PM_{2.5}$ platform and built a new and larger platform to allow for the expansion of our Air Monitoring Program. LRBOI will continue to grow, expand, and update our Air Monitoring Program in the future.

LRBOI's Website *www.lrboi-nsn.gov*

New $PM_{2.5}$ Platform



Little Traverse Bay Bands of Odawa Indians

Jon Mauchmar – Environmental Specialist – Air Quality
Program in Existence since – 2004
Program Projects – IAQ Education/Outreach, Renewable Energy/Energy Efficiency, mercury sampling, capacity building, past O_3 and PM
Location – Harbor Springs, MI

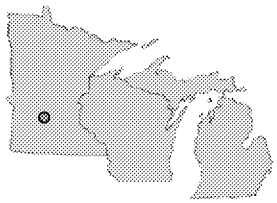
On September 21, 1994 the Little Traverse Bay Bands of Odawa Indians (LTBB) was federally reaffirmed with the signing of Public Law 103-324. The LTBB Reservation area encompasses approximately 336 square miles of land in the northwestern part of Michigan's Lower Peninsula and is bordered by Lake Michigan to the north and west.

In 2002, LTBB initiated an Air Quality Program that was focused on educational outreach and home radon monitoring. In 2004, the program was expanded to include a part-time Air Quality Specialist and in 2007 to a full-time Environmental Specialist. The current Air Quality Program is run by one Environmental Specialist and funded by a CAA 103 grant. Program staff drafted an Emissions Inventory (EI) in 2007-2008, from 2009-2011 the Program collected PM2.5 data and ozone monitoring occurred for the 2012 season. An updated EI was completed in 2013. Energy audits for LTBB owned buildings were conducted from 2014-2017. Two solar arrays totaling 50kW were installed in 2016 and 2018 to decrease energy production emissions. The Program is currently working with other LTBB Departments to implement measures to meet new energy standards under the Tribe's new Climate Emergency Resolution requiring LTBB to be carbon neutral by 2030. In 2021, LTBB will be looking into the increasing variety of grants and opportunities for collaboration with other agencies, organizations, and Tribes that are currently available for constructing solar arrays and other projects that reduce carbon emissions.

In 2022 we will be working with LTBB Housing and Health Departments to find a way to conduct IAQ assessments while following LTBB COVID-19 protocols. Through such consultation, the Air Quality Program has been able to assist LTBB Housing on locating areas in need of repair, cleaning, and preventative maintenance that will increase IAQ. Due to the tight building envelope designs used in our area, mold and ventilation are constant issues for LTBB IAQ.

LTBB continues to sample deciduous leaf litter to analyze the presence of atmospheric mercury in our area. Sample analysis is conducted by the National Atmospheric Deposition Program (NADP). Bioaccumulation of mercury is a concern in our area as fish and wild game are mainstays in the diets of the Odawa and many others in Northern Michigan.

LITTLE TRAVERSE BAY BANDS OF ODAWA INDIANS
ODAWA NATURAL RESOURCES DEPARTMENT



Lower Sioux Indian Community

Deb Dirlam – Director, Office of the Environment
Program in Existence since – 1992
Program Projects –IAQ, Ambient Air Quality, Education
Location – Morton, MN

The Lower Sioux Indian Community (LSIC) is located along the Minnesota River in Morton, Minnesota. The Reservation is comprised of 1,923 acres of "trust" land held for the Tribe. The Community contains mostly flat agricultural land along with approximately 250 acres of timber and brush and Minnesota River escarpment. The Tribal commercial center sits on the uplands and is surrounded by agricultural land, prairie pothole wetlands and Tribal housing. The Tribe is governed by the elected five-member Lower Sioux Community Council. The Tribe operates business enterprises such as a casino/hotel and other establishments. Approximately 1,080 Tribal members live on the Reservation in 160 single family dwellings and 16 duplex rental units. The regional land use is predominantly agricultural with several Tribal Members hold assignments to farm.

The Lower Sioux Community does not currently have an Air Grant through EPA. However, the Lower Sioux Office of the Environment (OE) staff is involved in air quality-related activities such as providing education and outreach to the Community Members and Lower Sioux government departments. Given the drought conditions during the Summer in 2021, the Council, OE and Legal worked to put into place burning restrictions to decrease the risk of uncontrollable fires. The OE staff worked closely with other Tribal Emergency Response Committee (TERC) members to complete the Tribal Hazard Mitigation plan (THMP). The Lower Sioux THMP does address air quality-related concerns related to natural disasters (wildfires, droughts) and mitigation measures to reduce potential hazards. OE staff continues to coordinate the Climate Adaptation and Renewable Energy Committee -CARE (the former Renewable Energy Advisory Committee, established in 2016). This multi-departmental committee assists in climate adaption and renewable energy development including advising on topics such as Climate Resiliency. Air quality and other environmental concerns increased over the past year due to the impacts from the operation of a mid-size Confined animal Feedlot operation (swine) located near (<0.5 mi) the Community. Anticipate future work to address the impact on air quality for Community residences and medical/cultural plants.

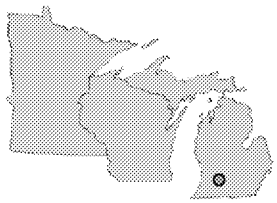
Air Projects/Programs for FY 2021-2022

•Open Burning, Barrel Burning, Fire Prevention, Permitting

•Mold/Moisture technical assistance to Housing; working with residences affected by flooding

•Research on air quality concerns related to animal feedlot operations

•Education on Carbon Monoxide, Mold/Moisture, Asbestos, Pests, Weatherization, and Radon



Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians

Shawn McKenney, Environmental Specialist
Program in Existence - 2003
Program Projects - Conservation Incentive Program, EI, IAQ, Alternative Energy Projects, Radon, Climate Change Adaptation Planning
Location – Shelbyville, MI

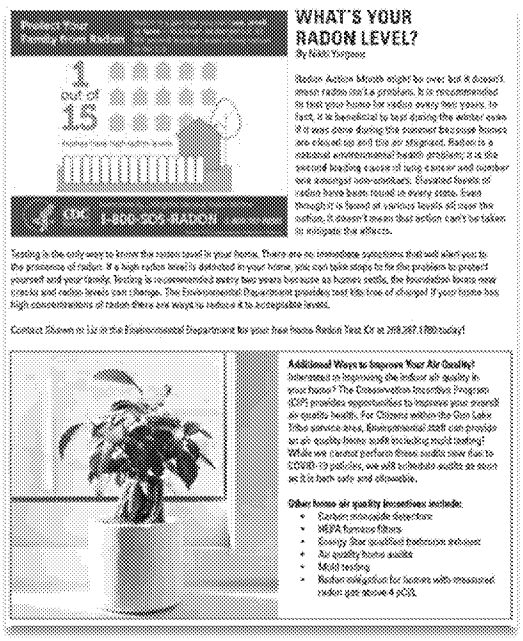
The Match-E-Be-Nash-She-Wish Band of Potawatomi Indians (Gun Lake Tribe) is a federally recognized Indian Tribe located in southwest Michigan with 588 enrolled members. The Reservation is composed of 735 acres held in trust by the United States Government for the Tribal community and possesses no exterior boundary. The Gun Lake Tribe continues to provide indoor air quality retrofits through the Conservation Incentive Program, these retrofits are funded through the Tribe's general budget and this program is managed through the EPA Performance Partnership Grant.

Indoor Air Quality Incentives through the Gun Lake Tribe Conservation Incentive Program include:

- Carbon monoxide detectors
- Energy Star qualified bathroom fans
- Air quality home audits
- HEPA and MERV 10+ rated furnace filter
- Mold testing
- Radon mitigation for homes 4 pCi/L radon gas or higher
- Radon detectors
- De-humidifiers

The Gun Lake Tribe has had to cancel all "in-house" indoor air quality audits for Tribal Citizens in 2021 due to COVID-19 restrictions. The back log continues to grow! The Tribe has increased air quality education through Facebook/Instagram posts and monthly newsletter articles. The Tribe continues to gain training and air quality equipment to grow capacities to nizhokmëwak Nokmëskinan "protect Grand Mother Earth" for the next seven generations.

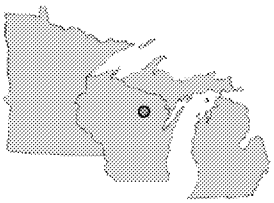
- Mnoyén- Gun Lake Tribe



WHAT'S YOUR RADON LEVEL?

1 out of 15

The Gun Lake Tribe's Non-Point Source Management Plan was approved by the EPA in 2019. The Tribe is excited to be implementing projects identified in this plan. Recently, all agricultural properties now have a mandatory 100' buffers along waterways and wetlands.



Menominee Indian Tribe of Wisconsin

Jeremy Pyatskowit - Environmental Services Director
Program in Existence – 2000-2010
Program Projects – Past: Acid Rain, Hg, Rn
Location – Keshena, WI

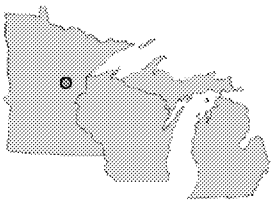
The Menominee Indian Tribe of Wisconsin (MITW) is a federally recognized Indian Tribe that inhabits 235,000 acres in northeastern Wisconsin which is 95% forested. The population within the Menominee Reservation is 4,857 (2000 U.S. Census).

The Menominee Tribe originally started the Air Program in 2000 to monitor for acid rain and mercury. The Program was funded by a Region v 103 air grant. We participated with the National Atmospheric Deposition Network for laboratory work and reporting, after 2006 we no longer participated in the acid rain monitoring due to funding cuts, however we were able to keep monitoring for mercury until March 2010. Mercury was continued longer because we filled a gap within the state for collection. One of the reasons the air funding was cut was because there is not a huge issue with acid rain or mercury levels within the Reservation. There is no industry on the Reservation except a Tribally operated sawmill in the Village of Neopit.

The Tribe annually collects fish for mercury samples. A future goal would be to be able to have an Air Program that would allow mercury samples collected and then combined with the fish samples to have a better correlation of mercury within the Reservation.

Radon testing back in the 1980's and 1990's showed many of the homes on the Reservation with elevated radon levels. In 2009 the tribe received a grant to do more radon testing on the Reservation. Our program provided technical assistance to homeowners who wish to install radon remediation systems. With the grant we were able to test many of the Tribes housing units and remediation systems were then installed by another agency within the Tribe. There is a need for continued monitoring of indoor air quality. Current workplans don't accommodate air issues. With needed funding, Menominee Tribe would be able to hire a staff member to work solely on-air issues.

Currently there is not a MITW Tribal Air Program. For most of 2021, Departments have been working back in the office as last year staff worked from home due to Covid 19. This has put all field work, report writing, and grant writing behind.



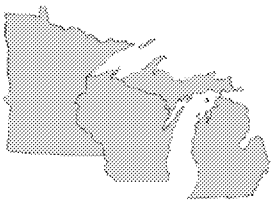
Misi-zaaga'igani Anishinaabeg ~ Mille Lacs Band of Ojibwe

Charles Jiró Lippert – Air Quality Specialist
Program in Existence since – 1996
Program Projects –O_3, IAQ, MTERA, PurpleAir
Location – east-central Minnesota

The Tribe began its Air Quality Program in September 1996 with the constitutional reform of the Mille Lacs Band of Ojibwe. In the beginning, our elders knew what the Air Program should address and made it part of the Tribe's statutes, but had no way of addressing our concerns, only hoping our vision would come together in the future. At the same time, Minnesota was under pressure to provide a determination for CO and asked for partnership with the Tribe. From this partnership, the Tribe eventually got assistance from CAA 103 grant funding through EPA. From our humble beginnings of CO monitoring, we moved to monitor for PM10, then for $PM_{2.5}$ and O3, only to find we were a down-wind transport recipient of metropolitan Minneapolis–St. Paul's air pollution. This led the Tribe to monitor for meteorological conditions, and for speciated $PM_{2.5}$ and for Hg. Today, the Tribe's Air Quality Program operates under CAA 105, continues to monitor for O3, assess PSD air permits issued by them that may impact our peoples and natural resources, work on air quality aspects of climate change, sustainability projects for energy and food independence, and waste reduction. In addition, the Tribe's Air Quality Program works closely with the Tribe's Public Health, Housing and Administrative offices to assess and monitor IAQ for domestic and industrial safety and hygiene.

The Air Quality Program actively addresses air quality improvements at all levels—personal, indoor, outdoor, local ambient, regional ambient, and international ambient—to ensure Band members are not dispossessed of their right to clean, healthy air. The Band continues to cooperate with MPCA in monitoring for O3 and will be seeking re-designation as a Class I air-shed, and will restore monitoring of Hg, Met, and continuous and speciated $PM_{2.5}$ to characterize, model and inventory air pollutants affecting the air-shed. Together with other Upper Midwest Tribes, the Air Quality Program participates with the Midwest Tribal Energy Resources Association (MTERA) to map out the Band's energy future. With impacts from COVID-19, the Band's Air Quality Program operated in a minimal bases but was ramped back up in order to meet the programmatic obligations to its citizens. In 2021 the Air Quality Program assisted the Band's Minisinaakwaang Leadership Academy in remote northern Minnesota to acquire a PurpleAir sensor. The sensor allowed the school to include study of air quality and particulate trends in its science curricula and kept students safe and connected to the school remotely. Through public outreach, the Air Quality Program recruited Band citizens and others in Minnesota and North Dakota to join in the PurpleAir particulate sensing. On July 29, 2021 Minnesota's worst Canadian and Western US Fires smoke event occurred. An air quality monitor in nearby St. Cloud, MN registered an AQI of 441—the highest ever value in Minnesota's recorded history, while the Mille Lacs sensors through AirNow Fire and Smoke Map reported AQI equivalence exceeding 600. Data from both the local air quality monitors and sensors helped inform Mille Lacs' elected leadership on taking necessary public health safeguards to protect the health of all Band citizens.

Mille Lacs Band of Ojibwe
http://www.millelacsband.com



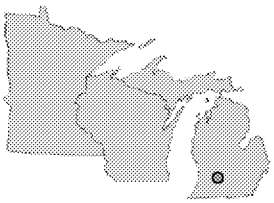
Minnesota Chippewa Tribe

Michael Northbird, Environmental Program Manager/EPA GAP Coordinator
Program in Existence since – 2015
Program Projects – Capacity Assistance
Location – On and Off Leech Lake, White Earth, Bois Forte, Fond Du Lac, Mille Lacs, and Grand Portage Reservations, Minnesota

The Minnesota Chippewa Tribe (MCT) is a Federally Recognized Tribe located throughout northern Minnesota, is a union of six (6) constituent Bands with Reservations adhering to the MCT Constitution, that was formed as the Preamble states … "in order to form a representative Chippewa Tribal organization, maintain, and establish justice for our Tribe and to conserve and develop our Tribal resources and common property; and to promote the general welfare of ourselves and descendants". These Band Reservations are as follows: Leech Lake Band of Ojibwe, White Earth Nation, Bois Forte Band of Chippewa, Fond Du Lac Band of Lake Superior Chippewa, Mille Lacs Band of Ojibwe, and Grand Portage Band of Lake Superior Chippewa.

The MCT Environmental Program (MCT EP) provides capacity assistance as needed for core environmental programs of the Bands that utilize USEPA grants. The MCT EP develops projects to assist in the protection of MCT land both on and off the 6 component Rreservations. This requires protecting the quality of the water, air, and land resources by supporting the basic infrastructure of the MCT Bands that make up the MCT. The MCT EP assesses a wide variety of potential project areas such as Tribal Waste Management (TWM), pollution prevention, emergency response planning, water quality management, air quality management, and education and outreach activities. While the MCT EP remains committed in its efforts to enhance, expand, and evolve capacity for TWM initiatives, a new focus will also include a comprehensive recommendation to the Tribes' leadership based on current climate assessment analysis that spans across the entire 54,000 square miles of northern Minnesota in which the Tribe exists. The MCT EP intends on highlighting the relationship that climate impacts and TWM will undergo in the near future in order to draw attention to the adaptation planning that has already been set in motion for the region.

The MCT EP is committed to assisting constituent Band Aair Pprograms for the benefit of the Tribe. Through technical assistance from the Bands, EPA and other Tribes, the MCT Tribal Executive Committee determines what further action(s) will be implemented when necessary. Once a determination has been made, then the MCT EP applies for the specific resources necessary to ensure all actions are taken, in order to protect air quality under MCT jurisdiction.



Nottawaseppi Huron Band of the Potawatomi

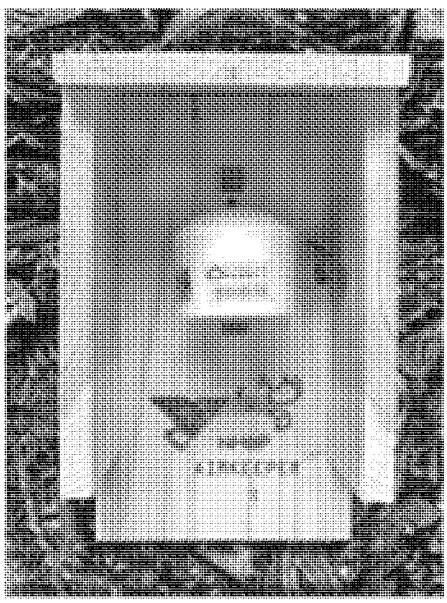
Amy Boelcher – Environmental Specialist
John Rodwan-Environmental Director
Program in Existence since – 2001
Program Projects – Radon, EI, Ambient Air
Location – Pine Creek Reservation, Michigan

The NHBP Air Program serves approximately 1,600 Tribal Members and is located on the Pine Creek Reservation in southwest Michigan. Pine Creek Reservation lies within a watershed containing agricultural land use in excess of 70%. Pesticides, herbicides, manure, dust, and oil and gas wells are some potential local sources of concern for our air quality. Particulate pollution from non-local wildfires is also a concern. We do not receive any air-specific funding. We run eligible components of our Program with EPA GAP funds and the remainder with Tribal general funds.

To date, NHBP-managed structures have had 197 radon tests and 28 mitigations and show average radon levels of 1.7pCi/l. In 2015, the NHBP Tribal Council adopted a Housing Construction and Health code that requires Radon Resistant New Construction for new structures built on Tribal lands. This year, even during pandemic scheduling, we were able to get our Radon QAPP finalized and approved by EPA.

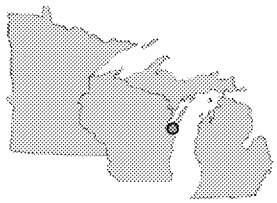
Current staff working on air projects are part-time, and like many other Tribes, also serving in other environmental positions. In addition to this, the COVID-19 pandemic has slowed our efforts to complete an EI. The Tribal Air Monitoring Center was a great help in providing us with contacts to explore the potential for outsourcing this work.

NHBP is interested in particulate pollution as it impacts community health. Studies from reputable air quality control agencies indicate high levels of correlation between PurpleAir (PA) sensors and expensive, commercial-grade sensors used by EPA. In 2021, we constructed protective housings for an additional 16 PA monitors. With help from our Communications Department, we created a social media post to ask for volunteers and were thrilled with the response from our Membership. There are currently 16 NHBP AirKeepers. We cited each monitor at Tribal Member homes in 7 counties in Michigan. Five are currently having wireless or electric connectivity issues (not connecting to the public map), and 2 are waiting to be hooked up after NHBP Government pandemic scheduling allows.



Our ambient air screening for particulate pollution with low cost air sensors has kept us connected with our members, in an era when staying connected has proved difficult. It also gives our members ownership of a significant environmental initiative and gives them direct real-time information about the condition of their own air. We hope to summarize screening trends in some way for our membership in 2022.

Purple Air Tribal AirKeepers sensor and housing.



Oneida Tribe of Indians of Wisconsin

Victoria Flowers-Environmental Compliance Coordinator
Program in Existence since – 1988 Environmental, Health & Safety Division established
Program Projects –Capacity building, IAQ, Radon
Location – Oneida, Wisconsin

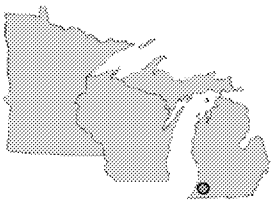
The Oneida Nation Environmental, Health and Safety Area has secured an EPA CAA grant to re-establish and expand its Indoor Air Quality Program.

The goal of this grant is to establish programmatic capability by training staff to serve as a resource for the Oneida Nation and be active in EPA Region 5 initiatives, such as participating in regional dialogue, performing home IAQ assessments, working with the Oneida Comprehensive Housing Department and Oneida Department of Public Works to be resource for home rehabilitation and supporting Healthy Home programs.

The Oneida Nation is committed to providing safe indoor environments for its citizens. Evaluating and prioritizing environmental programs that support this commitment align with the Oneida Nation's priorities of safe housing, protecting human health and the environment, and protecting critical infrastructure.

Due to the COVID19 pandemic, Oneida Nation citizens are spending more time indoors at their homes and many are working from home. Sources for indoor air pollution are diverse, ranging from radon, mold, moisture, improper venting of combustion sources, improper maintenance and operation of heating sources, smoking, as well as the types of cleaning products used in a home.

ONEIDA



Pokagon Band of Potawatomi Indians

Jennifer Kanine – Department of Natural Resources Director
Kyle Boone - Environmental Specialist
Program in Existence - 2000
Program Projects - Comprehensive Planning, Testing Air Sensors, EI
Location - Dowagiac, MI

Pokagon Band of Potawatomi Indians (Pokagon Band) was restored to federal Tribal status through congressional act on September 21, 1994. Instead of a Reservation, the Pokagon Band was mandated a service area that consists of four (4) counties in the southwest lower Michigan and six (6) counties in north central Indiana. The Band is the only federally recognized Tribe in the state of Indiana.

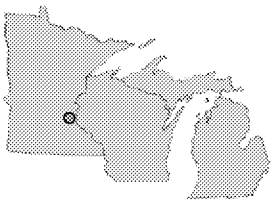
Our Resource Protection Programs are integrated into Tribal development activities through comprehensive planning. The goal is to mitigate potential direct and indirect impacts to air quality up-front, rather than confront issues later. However, there are times when historic property uses on recent land acquisitions influence actions taken on those properties.

The staffing limitations that were experienced in 2020 were alleviated in mid-2021. However, the prolonged loss of staff created a backlog of project objectives that the Pokagon Band needed to accomplish. Furloughed staff worked diligently once they were brought back, and many projects are making progress again. However, the extra attention given to the backlog did limit the amount of time that could be dedicated to air quality.

In 2021, the Pokagon Band Department of Natural Resources (PBDNR) was able to trouble shoot its recently acquired PurpleAir sensor. The air sensor is now monitoring for particulate matter at the PBDNR campus in Dowagiac, Michigan. Data from the sensor has not yet been analyzed. Data downloads should begin at the end of 2021 or beginning of 2022.

In 2018, the PBDNR was one of three Tribes in Michigan to be selected by the Natural Resources Conservation Service (NRCS) for the installation of a Tribal Soil Climate Analysis Network (TSCAN) weather station. There were some setbacks in installation due to an early onset of winter in 2019, followed by the pandemic, but in November 2021 the PBDNR assisted NRCS with the TSCAN installation on Pokagon Band lands near Dowagiac. PBDNR will now have access to an array of climate data such as wind speed and direction, precipitation, air temperature, and evapotranspiration. This data will be used to help PBDNR better understand the airshed of the Dowagiac area.

PBDNR has continued actively reviewing prevention of significant deterioration (PSD) permits to ensure that ambient air quality in the Pokagon Band's service area is not further degraded. Future endeavors regarding air quality include possibly expanding the use of ambient air sensors to other clusters of trust land.



Prairie Island Indian Community

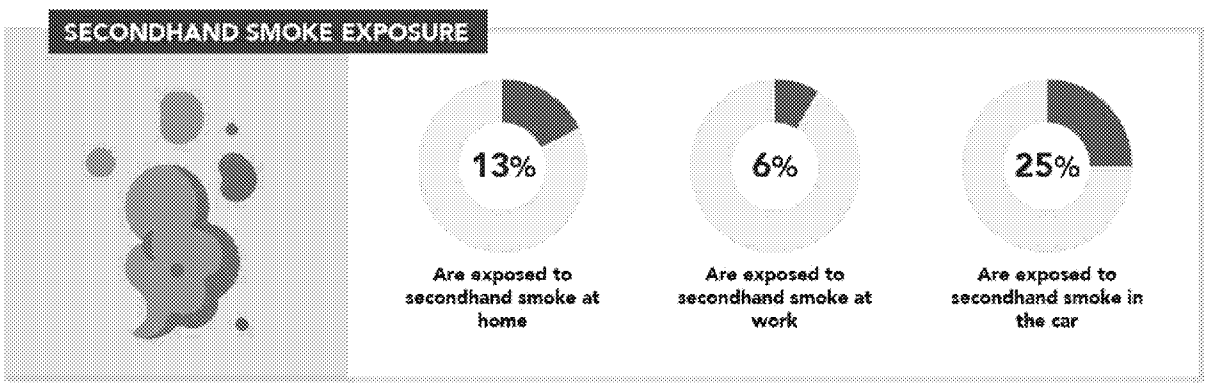
Gabe Miller - Environmental Programs Manager
Program in Existence since – June 2014 to October 2017
Program Projects – IAQ, Outreach, Radiological Monitoring
Location – Welch, MN

Prairie Island Indian Community (PIIC) is located between the Mississippi River and Vermillion River in southeastern Minnesota, downstream of the Twin Cities. In 2014, PIIC established an Air Quality Program under CAA 103 grant funding. Projects implemented under this funding included IAQ inspections, radon testing, Level 4 EI, air quality flag program, and outreach/education. The formal CAA 103 Air Program was terminated by the Tribal administration in late 2017. The termination was largely due to misunderstanding in the amount and type of radiation work this grant was able to cover. Despite this, the Land & Environment Department continues radiological sampling work as much as allowable under the GAP workplan.

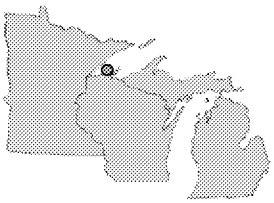
Xcel Energy's Prairie Island Nuclear Generating Plant is located just three blocks away from the community with spent fuel casks storage on-site, which is a high priority concern for the community. Sampling for radiological particulates has been ongoing since 1993 with a new monitor installed in late 2019, thanks to contract funding with the BIA.

An assessment of 142 Prairie Island Tribal members was conducted in 2019 in partnership with the American Indian Cancer Foundation (AICAF) and the PIIC Tobacco Cessation program. The data shows that 13% of respondents were exposed to secondhand smoke at home, and 25% in the car. 86% of respondents do not allow smoking in their home.

Tribal land is located in a high-risk zone for radon and flooding, further contributing to indoor air concerns. Testing for radon in Tribal community homes and combating mold growth has been important and was previously conducted under the Tribe's Emergency Management and Housing Departments through Minnesota Department of Health (MDH) testing kit support, though this project has also been halted due to staff turnover. Additionally, railroad, KFOS, and agriculture, as well as ethanol plants to the north surround the Tribe. These all contribute to ambient air concerns. A change in Tribal administration priorities would be necessary to re-start the Program and address air quality concerns.



Tribal Tobacco Use Project II Key Findings Report for Prairie Island Indian Community (AICAF)



Red Cliff Band of Lake Superior Chippewa

Vacant - Air Quality Program Manager
Linda Nguyen - Environmental Director
Program in Existence since – 2010
Program Projects –IAQ, EI, VW Settlement, $PM_{2.5}$
Location – Bayfield, WI

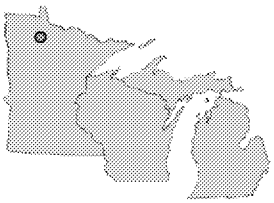
The Red Cliff Band of Lake Superior Chippewa (Band) is located on the Bayfield peninsula in the Northern most point of Wisconsin. We are surrounded on three sides by Lake Superior and enjoy a relatively undeveloped forest of hardwood and pine to our south. As the Reservation located so far north, the lack of heavy industry in the immediate area makes us not only unique, but an area much sought after for the nature enthusiast with hiking, boating, and fishing in the summer months, to snowshoeing, skiing, and leisure during the winter. More importantly, the beauty within and around Reservation is due to near pristine air quality. It is the goal of the Band to protect and maintain ALL aspects of our environment while promoting responsible future development. The Band's Health Center recognizes the increase of asthma and allergies within our community, especially among our children.

The Air Program (Program) is in its eleventh year and housed under the Treaty Natural Resources Division/Environmental Department. Program objectives include completion of indoor air quality (IAQ) assessments for residential, office, and school buildings located within Tribal boundaries, participation in the VW Settlement, and studying PM2.5 movements within Tribal exterior boundaries using the Met One E-Sampler Light Scatter Continuous Aerosol Monitor.

The Program has been working in concert with the Tribal Healthy Homes Network, Healthy Homes Partnership, The Institute for Tribal Environmental Professionals (ITEP), and EPA in producing Healthy Homes Guidance's for Tribal Families, Leadership, Medical Professionals and Housing Professionals. These Guidance's can be found on the NTAA website under IAQ Work Group. Also, the Air Program and NTAA worked with these entities in providing informational webinars for the re-opening of Tribal Buildings during the COVID Pandemic, in which two complete webinar series are available on the NTAA website. Current collaboration with the Red Cliff Community Health Center staff is ongoing during the COVID Pandemic as it pertains to Indoor Air Quality.

The Program has received continued CAA 103 funding since 2010. Funding ensures the Band's participation in local and regional issues, while furthering our ability to protect our people and our way of life. Unfortunately, the Air Quality Program Manager position has been vacant since September of 2021. All interested candidates are encouraged to apply through the Tribe's website. Come be a part of the Red Cliff Environmental Department!

Website: *http://redcliff-nsn.gov/*



Red Lake Band of Chippewa Indians

Jennifer Mailinski – Environmental Specialist
Program in Existence since – 2007
Program Projects – CASTNET, $PM_{2.5}$, Hg Leaf Litter, Outreach
Location – Red Lake, MN

The Red Lake Reservation is a federally recognized closed Reservation encompassing over 835,000 acres of north-central Minnesota. The Reservation is the largest within EPA Region 5, comprising greater than 59% of the Federal Indian Trust Land of the Region. The Tribe currently has just over 15,000 enrolled members, of whom about 7,500 reside on the Reservation. Preserving the Reservation's abundance of natural resources is critical to Band members' health, welfare, traditional ways of life and economic viability.

The Red Lake Department of Natural Resources (RL DNR) began an Air Quality Program in December of 2007 with GAP funding and in the spring of 2009 secured CAA 103 funding. With the approval of its TAS application, the program transitioned to CAA 105 funding in 2014. In 2016, the CAA 105 funding was incorporated into a Performance Partnership Grant (PPG).

Red Lake operates and maintains a BAM 1020 $PM_{2.5}$ continuous monitor with assistance from the Minnesota Pollution Control Agency (MPCA), a small footprint Clean Air Status and Trends Network (CASTNET) site, and an ammonia monitoring site with the Ammonia Monitoring Network (AMoN). The program also collects data on mercury dry deposition as part of the Litterfall Mercury Project with the National Atmospheric Deposition Program (NADP). The Air Quality program has worked to create important documents, such as a Tribal Smoke Management Plan (SMP) and Emissions Inventory (EI) documents, including a draft Greenhouse Gas EI.

Red Lake has replaced four older diesel vehicles and is in the process of replacing two more diesel vehicles with Volkswagen settlement funds. These funds were also used to install four electric vehicle charging stations on the Reservation. Red Lake has partnered with MPCA to provide woodsheds to Red Lake community members and to install a PurpleAir sensor in Warroad, MN. There are plans to install additional PurpleAir sensors at other locations on the Reservation in the future.

Although ambient air quality has been the primary focus of the Program, indoor air quality (IAQ) remains a concern. Basic IAQ home assessments of homes on the Reservation are available upon request.

The Program is currently waiting for responses to a community survey done to collect opinions on where to focus time and attention as far as which air quality issues are of most concern. Prioritizing concerns will help shape the Air Quality Program to better serve the Red Lake communities. Other community outreach continues.

We are always looking for partnership opportunities that allow us to improve indoor and outdoor air quality for the people of Red Lake.

Red Lake DNR Website http://www.redlakednr.org

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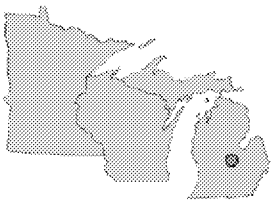

Saginaw Chippewa Indian Tribe of Michigan
Sally Kniffen – Environment Specialist
Program – Currently working with ITCM
Program Projects – Climate Change, EI, IAQ, Air Quality concerns for petroleum extraction operations
Location – Mt. Pleasant, Michigan

The pandemic has made it challenging to work, as things tend to take a longer time to complete now due to many factors. Due to Covid and staffing issues the Saginaw Chippewa Indian Tribe of Michigan was unable to be reached for a submission. This highlights the fragility of Tribal programs when staffing and capacity building is sidelined by an outside stressor such as Covid.

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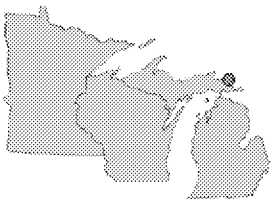


Sault Ste. Marie Tribe of Chippewa Indians

Robin Bouschor – Environmental Specialist
Program in Existence since – 2016
Program Projects – IAQ, TAS, VW Diesel, AQ Outreach, NADP
Location - Sault Ste. Marie, Michigan

The Sault Tribe of Chippewa Indians (Sault Tribe) is spread out across the beautiful eastern Upper Peninsula of Michigan. The headquarters for the Tribe is in Bahweting (Sault Ste Marie, MI). The Sault Tribe Environmental Department has been undergoing steady growth in its capacity to take on environmental regulation, including air quality work. The Tribes Air Program started operating in 2016 via federal funding under the CAA 103 grant. In October 2021, the Sault Tribe took a step forward in asserting its sovereign authority through submitting a TAS application under CAA 105, 505 a(2) authorities.

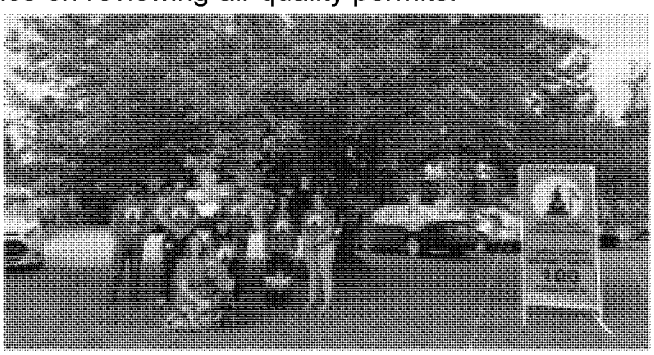
Despite the challenges the current global pandemic has brought, our Air Quality Program (AQP) has been able to persevere. The AQP has began operating a NADP site under the NTN in the late fall of 2021. NTN measures free acidity, conductance, calcium, magnesium, sodium, potassium, sulfate, nitrate, chloride, and ammonium. It was extremely challenging getting a site set up during a pandemic as we faced significant hurdles, however we are extremely pleased as it is now operating.

In-person IAQ assessments were able to resume in early spring with additional safety measures in place, only to be later suspended in the late fall due to Covid. We will continue to offer virtual assessments and assist answering any Tribal members questions as it relates to IAQ.

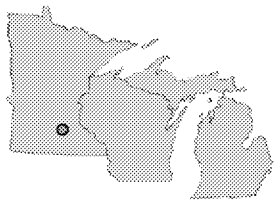
Outreach and training events occurred through a mixture of in person and virtual events. The AQP was able to set up educational outreach booths at two events this year. One at the annual "Engineers Day", in Sault Ste. Marie MI and the other at the Sugar Island Powow, Sugar Island, MI. It was wonderful seeing Tribal members being able to "swing and sway the Anishinaabe way" again. The program gave away free self-test Rn kits and kid orientated educational outreach bags that included AQ coloring books, markers and particle catcher experiment they can conduct at home, they were a huge hit! Sadly, a few events were canceled due to the pandemic this year, but this left room for a virtual collaboration with JKL Bahweting School on creating social media content to promote the Sault Tribe AQP.

In addition, the Tribe was accepted into the 4th funding cycle of the VW settlement this year. The Tribe participated in the 2nd and 3rd VW Settlement funding cycles that gave the Tribe the ability to replace two older diesel trucks with cleaner and more efficient diesel trucks. The AQP has also been gaining capacity and experience on reviewing air quality permits.

Sault Tribe NADP Site



Sault Tribe Environmental Department participating in orange shirt day to honor those who survived the Indian Residential Schools and those who did not.



Shakopee Mdewakanton Sioux Community

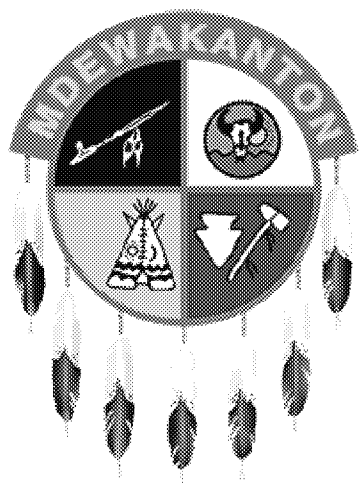
Simeon Matthews – Industrial Hygienist
Steve Albrecht – Operations Administrator
Program in Existence since – 2011
Program Projects – Sustainability, Renewables, Composting, Tribal NSR
Location – Prior Lake & Shakopee, MN

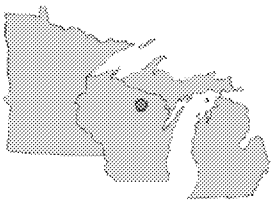
When SMSC was first organized under federal Reservation status in 1969, it was confined to 260 acres of rural land. In 2021, our community covers more than 4,700 acres, south of Minneapolis. That growth has brought many improvements to quality of life for SMSC and our neighboring communities, but also new challenges. We're affected by air pollution from traffic, industry, and even the wildfires that are setting new records more and more often.

We continue responding to the pandemic; relying on funding from the CARES Act, BIA, and the EPA GAP Program to protect our community against this airborne threat. ITEP and NTAA have been more important than ever this year, keeping us informed of new resources and the constant changes in Indian Country. Our ancestors lived in balance with *Uŋcí Maká*, Grandmother Earth; the carbon from their fires was re-captured to form the next generation of all living things. But the industrial revolution changed all of that, releasing all of the excess carbon that fossils are meant to lock away. Synthetic gases were invented that trap thousands of times more heat than CO_2. So we're searching for a modern return to balance, for every generation to come. Our clean water, ambient air, and lands are localized resources, but our atmosphere is the one resource that we truly share with everyone; our actions to reduce greenhouse gas emissions benefit all of *Uŋcí Maká*.

In late 2020 we tried to expand our electric vehicle (EV) infrastructure with an electric shuttle bus pilot project cost-share; one year later, the state is still trying to navigate federal contracting requirements. We may have to abandon that hope soon. We also hope to divert even more food waste from landfill, but the state's compost permitting process is ongoing. In late 2021 we began several other projects to assist us chart an aggressive path to carbon neutrality: Investment-grade energy audits of 19 buildings, our first Community-Wide Greenhouse Gas Emissions Inventory, our first Climate Vulnerability Assessment, a Community-Wide Ground Cover, Tree Canopy, and Carbon Sequestration Baseline study, Micro Heat Island Characteristics Baseline study, and Walk Score/ Bike Score Heat Mapping. These studies will conclude in the spring of 2022, to help identify ambitious and effective next steps towards carbon neutrality and a return to balance.

It took several months this year to find a provider for comprehensive home energy audits (the state-subsidized Home Energy Squad only serves customers of the state's two largest utilities). As we participated in the state's "MN CIP Tribal Initiative" this year, we learned that even though the energy burden is much greater for homes without access to natural gas, a family that relies on propane or fuel oil can't use the CIP to improve their home's heating efficiency. Ten or more utility providers divide some Nations, and each utility uses its CIP funding to assist (or not) the families in its service area as it sees fit.



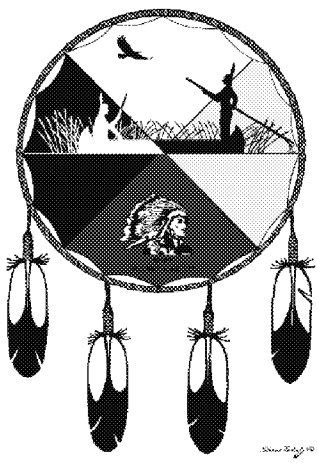


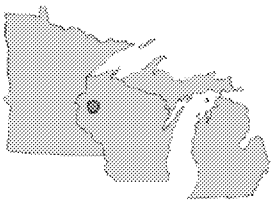
Sokaogon Chippewa

Tina Van Zile – Environmental Programs Manager
Nathan Podany - Hydrologist
Program in Existence since – No formal program
Program Projects – Building CAA 103 program
Location – Mole Lake, Wisconsin

As all of us know, 2020/2021 were tough years. COVID came and normalcy went out the window. Projects were put on hold and community events were canceled. Things that were easy, such as meeting with coworkers, became difficult. In some cases, we lost loved ones who can never be replaced. Due to Covid and staffing issues the Saginaw Chippewa Indian Tribe of Michigan was unable to be reached for a submission. This highlights the fragility of Tribal programs when staffing and capacity building is sidelined by an outside stressor such as Covid.

In past years, the Sokaogon Community installed solar panels and built green homes that utilize geothermal energy for heating and cooling. Moving forward, the Tribe will continue to protect their natural resources for future generations.





St. Croix Chippewa Indians of Wisconsin

Jamie Thompson- Air Quality Coordinator
Program in Existence since – 2004
Program Projects – Indoor and Ambient Air Quality, Radon
Location – Scattered throughout Burnett, Polk and Barron Counties, WI

Through the years the St. Croix Chippewa Indians of Wisconsin have received funding from the EPA to maintain an Air Program. With consistent funding provided by EPA, St. Croix has been able to provide air quality assessments, outreach and education to Tribal community Members for several consecutive years now. In fiscal year 2021, St Croix was awarded SIRG funds to test homes and Tribal buildings for radon. The SIRG funds were included in our PPG grant award.

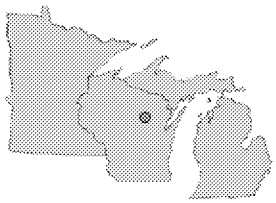
The Indoor Air Program, housed in the St. Croix Tribal Environmental Services Department, continues to maintain a close relationship with our St. Croix Tribal Housing Authority, which has allowed a combination of resources and expertise to ultimately advance the Air Program with rehabilitation recommendations implemented by the Housing Authority. The main focus of the assessments is moisture and leak issues that result in mold concerns. As an outcome, staff is mainly focused on building science relating to home construction and maintenance. Several areas are periodically called upon for testing including CO, radon, VOC's, ETS, sewer gases, asthma triggers and pests.

As part of the St. Croix's Air Program, we provide members with education and outreach focusing on creating healthy homes for the St. Croix Communities. Each time we do a home inspection we give the resident a carbon monoxide detector (if needed) and a healthy home packet. Included in this packet are numerous pamphlets and articles including but not limited to healthy home tips, mold prevention, asthma and outdoor air pollution information, bed bugs pamphlet, information on carbon monoxide, and secondhand tobacco smoke to name a few.

The CAA 103 funding has allowed growth of the Program by retention of qualified staff who serve as a resource for the St. Croix communities. The major focus of the Air Quality Staff is the involvement in active R5 initiatives; such as participation in regional dialogue on conference calls, attending regional meetings, performing home assessments and working cooperatively with the Tribal Housing Department to help rehabilitate homes and promote cleaner air for Tribal members and employees. We also strive to protect and enhance all of our natural resources for future generations to come, to help allow them in carrying on Tribal traditions.

Tribal Website: https://stcroixojibwe-nsn.gov/resources/epa/

St. Croix Tribal Member: Conrad St. John with his 2 eldest daughters, exercising their treaty gathering rights, harvesting this sturgeon during the spring spearing season.



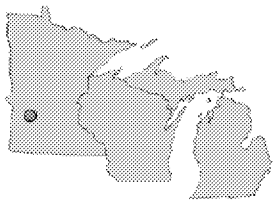
Stockbridge-Munsee Community Band of Mohican Indians

Antoinette Tourtillott-Environmental Program Coordinator
Program in Existence –No formal program
Program Projects – IAQ, Develop IAQ program, Radon
Location -Wisconsin, between Green Bay WI, And Wausau, WI.

The Stockbridge-Munsee Community Band of Mohican Indians, the "People of the Waters That Are Never Still," is a federally recognized Indian Tribe which originated in New York's Upper Hudson River Valley. European settlers moved the Tribe from native lands to a Reservation in Stockbridge, Massachusetts, then on to a location on Lake Winnebago in Wisconsin, and finally to two sections of land carved from the Menominee Reservation in Wisconsin. The Stockbridge-Munsee Community Reservation is currently located in northeastern Wisconsin in the townships of Red Springs and Bartelme in Shawano County. The Reservation has approximately 25,163 total acres with roughly 17,424 held in trust by the federal government and another 7,739 held in fee land.

The Stockbridge-Munsee Environmental Department has a mission to use the latest science to holistically observe, monitor and, when needed, manage the Reservation land, water, animals and plants which they support in order to ensure the diversity and purity of these resources for future generations to thrive in wellness. Our vision is following our culturally sensitive ways to incorporate the use of scientific methods in order to live sustainably with mother earth, carefully preserving the natural resources in a pristine condition for the next seven generations to come. Working with our forestry and conservation committees along with other Tribal departments, to protect, maintain and where necessary, improve the health of the natural environment for all species.

The Stockbridge-Munsee Community continues working on the development of an Indoor Air Quality program using General Assistance Program (GAP) funds to aid in this process. The project area will encompass the reservation areas in the Townships of Bartelme and Red Springs, in Shawano County Wisconsin. The Stockbridge-Munsee Environmental Departments duty is to protect all our natural resources including our Air, we are committed to protecting the health, welfare and sovereignty of our members. Also, through our Environmental Department we are committed to furthering Tribal capacity, educating the community, and providing a safeguard to the health and wellness of the Stockbridge-Munsee Community members and local community. We continue to build our relations and address immediate environmental concerns through educational outreach, recycling, remediation and radon testing.



Upper Sioux Community ~ Pezihutazizi Oyate

Amanda Wold – Environmental Director
Sydney Finn – Environmental Specialist
Program in Existence since - 2012
Program Projects – none
Location – Granite Falls, MN

The Upper Sioux Community (USC) Office of the Environment (OE) does not currently have an Air Quality Monitoring Program (AQMP). An AQMP is possible in the future and would be a major step for providing site specific, scientific data for the USC. This Program could be utilized to compare air quality information between the USC and other Tribes within Region 5 and nationwide.

Air quality monitoring is an important program that would allow the USC to understand, monitor, and manage the air quality within the USC Reservation. The USC continues to be engaged with the air quality work within the Region by attending monthly EPA air meetings, reviewing air data, and providing community engagement newsletter articles about how to improve indoor and outdoor air quality to the USC Tribal members. In 2019 and 2020, the USC applied for and received Volkswagen Settlement funds to replace two diesel vehicles- one plow truck and one propane truck to implement NOx reduction measures within USC.

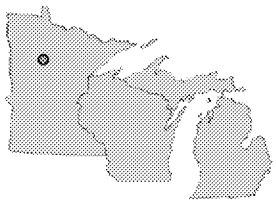
The USC's main concerns revolve around a changing climate and how climate change, along with agricultural activities are impacting air quality. Specific air pollutants that are likely to increase with climate change and result in negative health impacts include PM, O3, pollen, and mold. According to the Asthma and Allergy Foundation of America, Tribal communities are exposed to higher rates of air pollution than other communities. Climate change may affect exposures to air pollutants and allergens in three main ways:

- Creating both more windiness and more air stagnation events: On calm days, air can be stagnant, and pollutants can hang in the air as smog. On windy days, smoke and other air pollutants can blow into the region from other places causing poor air quality.

- Increasing temperatures: Rising temperatures increase the demand for air conditioning, which leads to an increased use of fossil fuels that contributes to air pollution.

- Lengthening the growing season: Climate change is lengthening the allergy season, increasing the potency of allergens, and introducing plants with more allergenic pollen.

On-road vehicles; heating sources; off-road vehicles and equipment such as those used in construction and agriculture; and power plants/factories all contribute to USC's air pollution. With the USC located within an agricultural epicenter, the Community is surrounded by PM from agricultural industries. Agricultural activities are exempt from the majority of the CAA regulations; as such, the USC has not had an opportunity to address concerns created by agricultural activities. One question that the USC has is what are the cumulative impacts to human health due to these agricultural activities, including burning emissions, pig and turkey farms, agricultural vehicles and tractors, bare soil (roads and fields), and pesticides? Access to funding would allow the USC to support a robust Air Program that would be able to investigate and respond to these questions.



White Earth Band of Ojibwe Gaa-waababiganikaag

Jessica Tollfson – Quality Assurance/Business Manager
Program in Existence – No formal program
Program Projects – Radon, Carbon Monoxide, Air toxics
Location – Mahnomen, MN

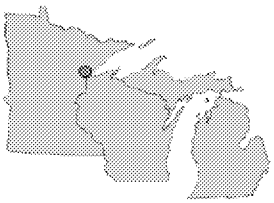
The White Earth Band of Ojibwe (Gaa-waababiganikaag), a sovereign nation, is entrusted to protect the land base, natural resources, treaty rights, and the culture and identity of our members. The White Earth reservation, located in Northwest Minnesota, was established in 1867 by a treaty with the United States Government and Mississippi Band Ojibwe. Status as a Tribal Government provides the White Earth Reservation with broad powers, ensuring various protections for the Tribe and its individual members. The Reservation boundaries include 36 townships which encompass all of Mahnomen County and portions of Becker and Clearwater Counties. The area includes five incorporated cities and five major villages.

The Natural Resources Department was established to protect, manage and enhance the resources of the Reservation and is responsible for daily management and monitoring of Tribal resources of the Reservation. Air quality is of great importance to White Earth. Indoor air quality projects are currently in the GAP workplan, however we look forward to the consideration of a formal air program in the future. The current COVID-19 pandemic has made outreach to individuals more difficult in the social settings we are used to such as Tribal events and gatherings. This has resulted in less personal communications in distanced media forms like newspapers and social media. We are looking forward to those face to face conversation's again once we are done with this pandemic.

Healthy Homes environmental education and engagement "Think Green – Live Green" campaign provided information for 100 households on the risks of carbon monoxide and how it can enter your home. Along with, education, there was a CO detectors provided to participants. We had another opportunity to provide carbon monoxide information to fishing derby participants addressing the risks and dangers of CO in fish houses and what to look for if exposure is suspected.

Projects on the horizon:

- Radon QAPP development and home testing
- Carbon Monoxide education and household CO detector giveaway (continued)
- Air toxics and home pollutants education and healthier alternative options



1854 Treaty Authority

Tyler Kaspar - Environmental Biologist
Program in Existence since – No Formal Program
Program Projects – Environmental and Permit Review, Policy Review, Climate Change, Education and Outreach
Location – Duluth, MN

The 1854 Treaty Authority (TA) is an inter-Tribal resource management agency governed by the Bois Forte Band of Chippewa and Grand Portage Band of Lake Superior Chippewa. The Organization is charged to preserve, protect, and enhance treaty rights and related resources in the 1854 Ceded Territory. This Ceded Territory covers 5.5 million acres across present-day northeastern Minnesota.

The Bands retain treaty rights to hunt, fish, and gather in the 1854 Ceded Territory (CT). Due to these rights, the 1854 TA is concerned about the availability and health of the resources. The 1854 TA looks to track air impacts from sources such as power generation units, mining, and other industrial facilities. Taconite mining has had a large impact to the 1854 CT, with many projects ongoing and new projects being proposed. The 1854 TA coordinates with federal and state agencies in environmental review and permitting processes and is currently involved in the scoping phase for a proposed copper/nickel mine in support of the Bois Forte and Grand Portage Bands who are also involved. Time is also spent reviewing and commenting on policies that may affect the air quality within the 1854 CT.

The 1854 TA does not have a formal Air Program, however addresses air issues (to some degree) under activities of the Environmental Program as it works to protect human health and the environment. One of these activities is implementing the "Climate Change Vulnerability Assessment and Adaptation Plan" that was developed in partnership with the Bois Forte, Fond du Lac, and Grand Portage Bands in 2016. A portion of the plan is dedicated to potential climate change impacts to air quality. In summer 2021 much of the 1854 Ceded Territory was in drought which led to several wildfires, the largest being the Greenwood Fire which burned 26,797 acres in the Superior National Forest. The fires here and in Canada impacted air quality and an alert was issued by the Minnesota Pollution Control Agency for a large portion of the 1854 CT on 8/24/2021 due to conditions expected to be unhealthy for all people.

Air filled with smoke and haze from the Greenwood Fire (Photo: KSTP/Kristen Swanson)

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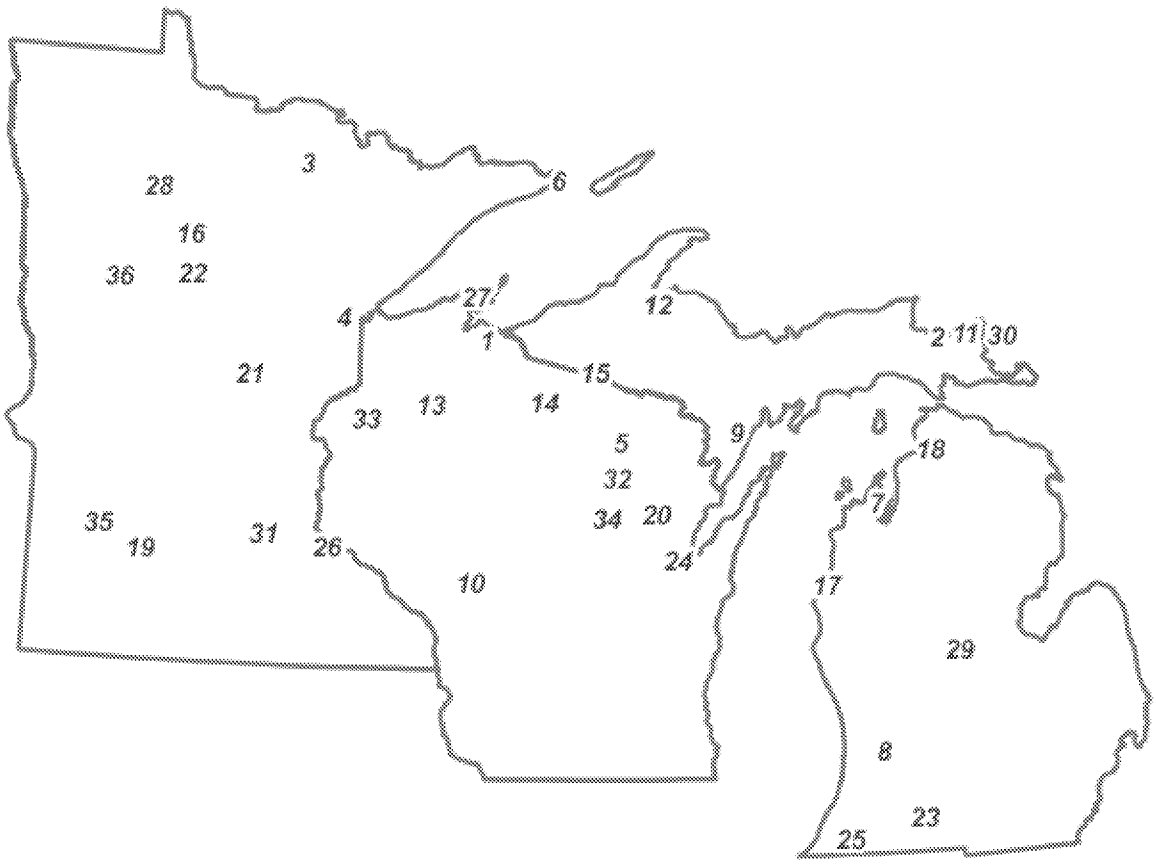
US EPA Region 5 Tribes



1 Bad River Band of Lake Superior Chippewa
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3 Bois Forte Band of Chippewa
4 Fond du Lac Band of Lake Superior Chippewa
5 Forest County Potawatomi Community
6 Grand Portage Band of Lake Superior Chippewa
7 Grand Traverse Band of Ottawa & Chippewa
8 Gun Lake Band of Potawatomi Indians
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32 Sokaogon Chippewa Community
33 St. Croix Chippewa Tribe of Wisconsin
34 Stockbridge-Munsee Community
35 Upper Sioux Community
36 White Earth Band of Chippewa

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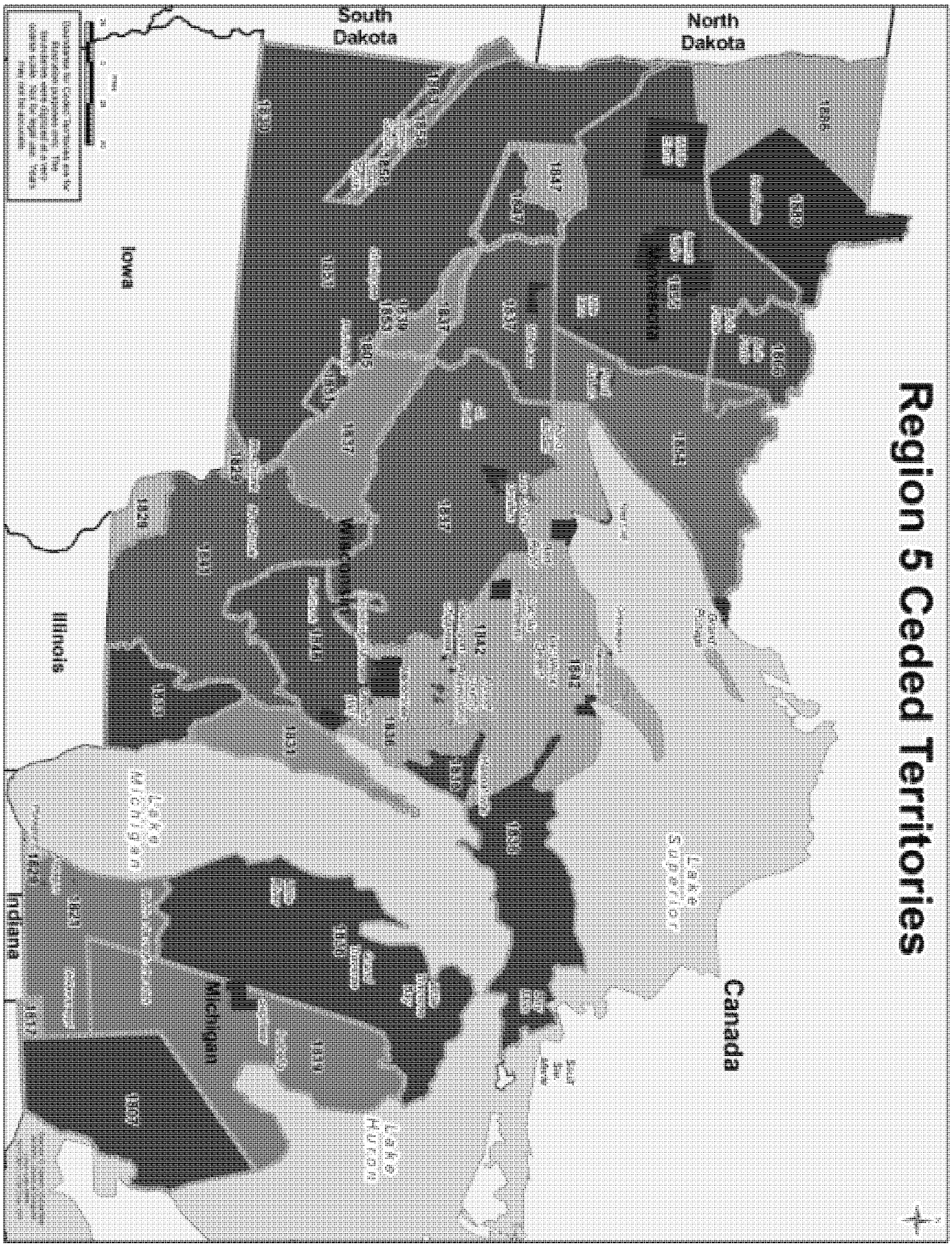


Note: This representative Ceded Territory map is in process of updating. We tried to get it done in time for this publication, however it will be available in early 2022. The updated map will be included in the 2023 TARJ publication and other 2022 publications as appropriate. Thank you -the Editors

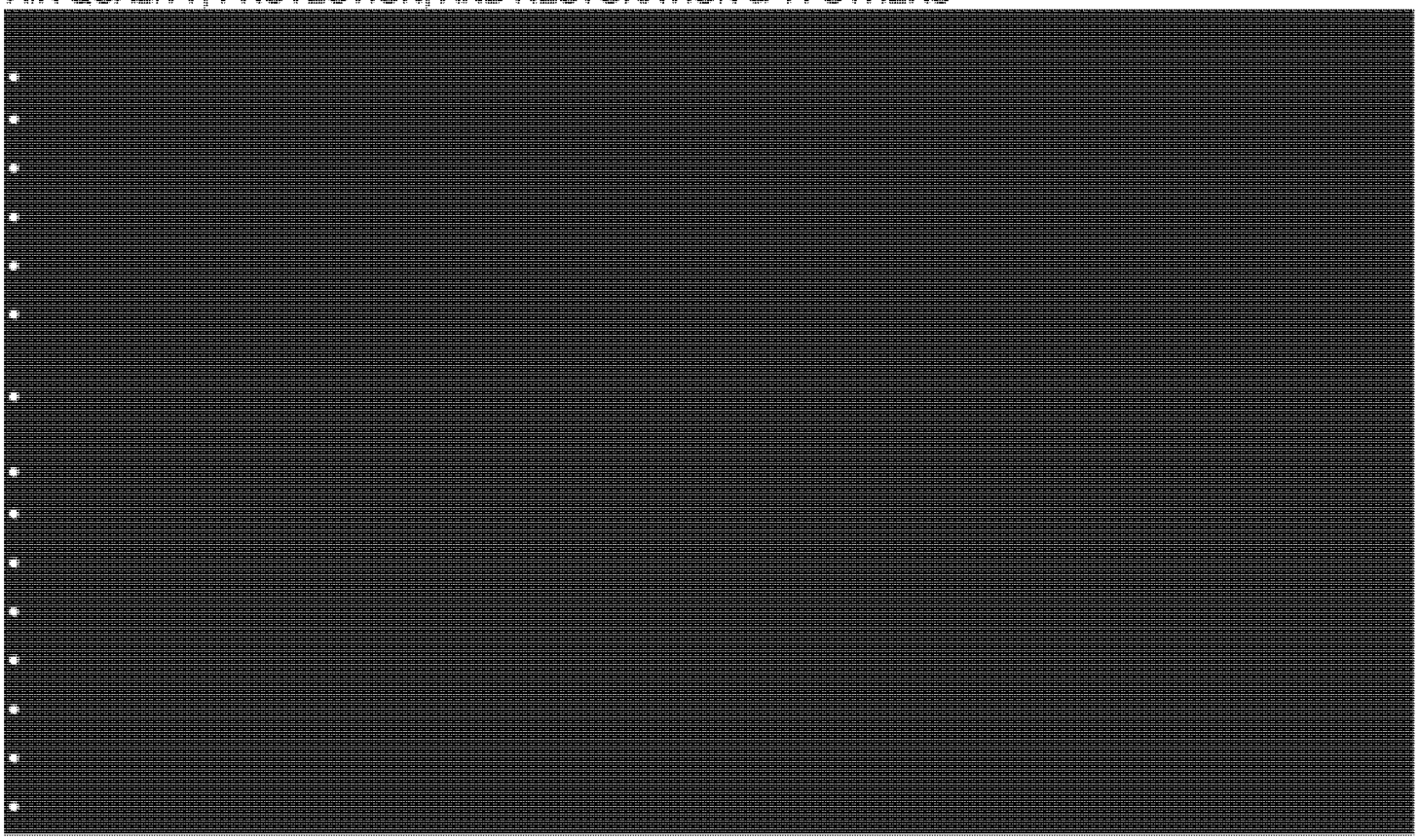
ED_006533_00001269-00051

Message

From: Millett, John [Millett.John@epa.gov]
Sent: 12/23/2021 1:25:34 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]
Subject: RE: Happy Birthday to MATS...

Here you go, Joe!

AIR QUALITY, PROTECTION, AND RESTORATION & 14 OTHERS



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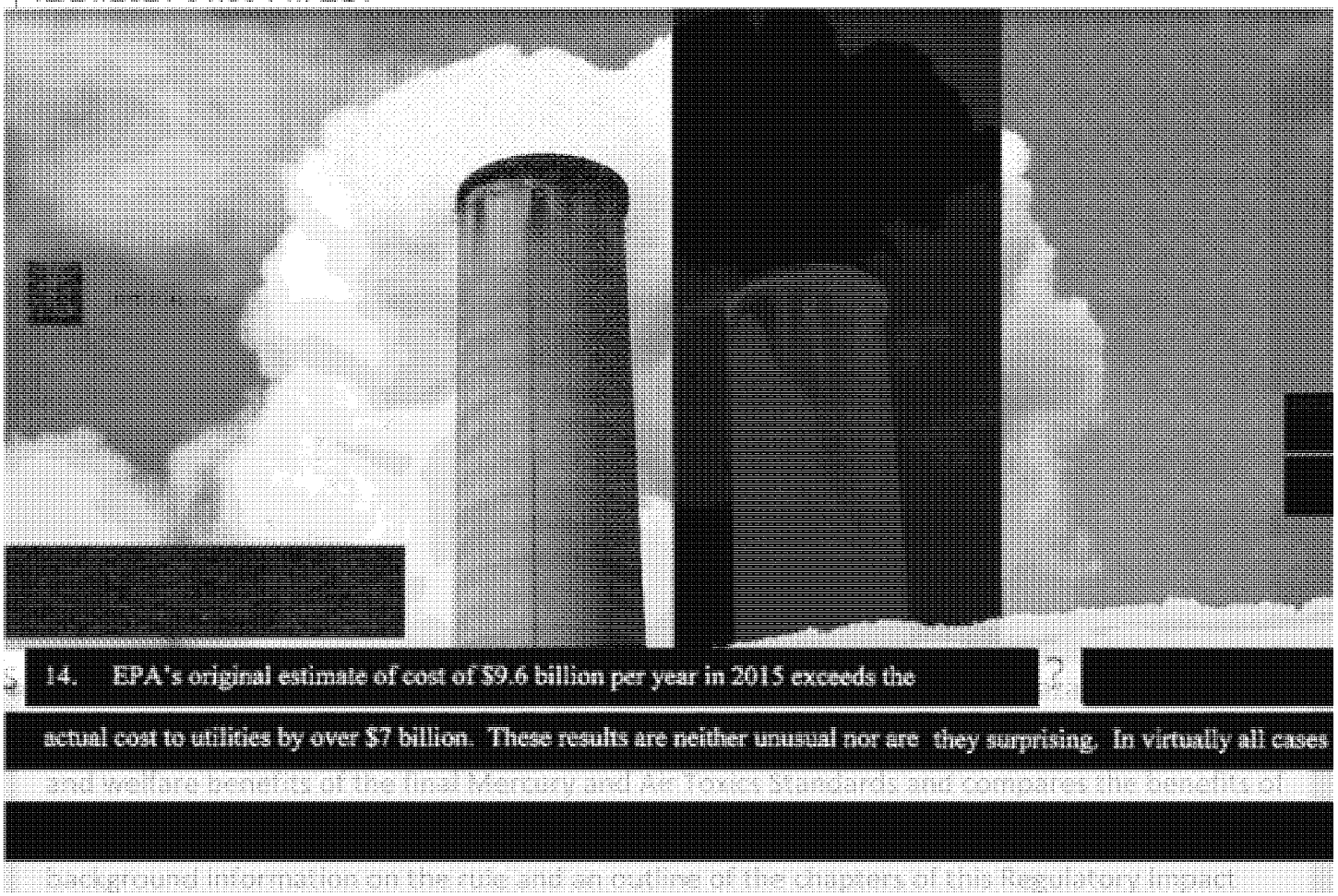
How EPA's power plant rule dodged industry 'fear-spreading'

BY:

SEAN REILLY

| 12/21/2021 01:05 PM EST



Debate over EPA's Mercury and Air Toxics Standards has been dogged by a compliance cost forecast that was likely much too high.Claudine Hellmuth/E&E News (illustration); Mrs. Gemstone/Flickr (smoke stacks); Court Documents (text)

GREENWIRE | A decade ago, the power industry's forecasts were abuzz with alarm: Soaring electricity rates. Coal plant closures. Job losses. Grid reliability problems.

"Will the lights go out?" the Congressional Research Service asked rhetorically as EPA neared completion of its rule — which marks its 10-year anniversary this week — to limit power plant emissions of mercury and other hazardous pollutants.

The answer, as both the agency and the nonpartisan research service concluded, was no.

While EPA's estimate of the future costs and benefits provoked a long-running legal clash, the agency's predictions of the real-world consequences were considerably more accurate than industry's.

"There was a lot of exaggerated fear-spreading," Bob Perciasepe, EPA's deputy administrator at the time, said in an interview this month. But in hindsight, he said, "I personally have a sense of pride that EPA did a really good job of anticipating — to really think through and listen to — what the potential problems were."

Those regulations — coupled with low natural gas prices and other regulations — helped drive a historic shift away from coal power generation and slash the staggering amounts of air pollution that went with it. Even some power industry representatives concede that the predicted reliability gaps never materialized. In part, they say, that was because EPA granted additional compliance time.

Meanwhile, compliance costs for the rule — formally known as the Mercury and Air Toxics Standards, or MATS — were almost certainly far less than the agency's estimates (*Greenwire*, Nov. 10). And

independent scientists and economists have found the dollar value of the health benefits to be much greater.

"The science is clear: mercury emissions from U.S. power plants cause a variety of serious health harms, and the value of reducing emissions is orders of magnitude higher than EPA's initial effort at monetization for the 2011 rulemaking," researchers wrote in a Harvard University paper released last week. Power plant releases of mercury, a brain-damaging toxin that poses a particular threat to babies, plunged from 29 tons in 2010 to 2.6 tons last year, EPA numbers show.

Consider Ohio-based American Electric Power Company Inc., one of the nation's largest utilities with a traditionally outsize dependence on coal. As EPA marched closer to release of the final rule, the company was among those warning of the perils posed by MATS and a separate crackdown on power plant pollution that wafted across state lines.

Those and other regulations could force "abrupt and significant power plant retirements," Janet Henry, AEP deputy general counsel at the time, told a House oversight subcommittee at a July 2011 hearing. "And with those retirements come increased risks of unanticipated electric grid reliability problems, particularly during the 2014 to 2016 period," she added, noting in her written statement that "very high" rate increases and more than 1 million net job losses could ensue.

Like other major utilities, AEP has long since complied with the standards with no serious snags reported. From 2011 to last year, its mercury emissions fell from 4,544 pounds to 195 pounds, according to company figures.

Coal-fired plants now account for 43 percent of its generating capacity, compared to about two-thirds a decade ago. Asked about the accuracy of Henry's 2011 testimony, AEP spokesperson Scott Blake said in an email that some cost and reliability concerns "were not fully analyzed and vetted at the time . . . due to the broad scope of changes required." Other issues were addressed through compliance extensions and industry coordination, he said. The company is now focused on a transition to "clean energy resources."

But the Congressional Research Service in a 2012 report found little grounds for concern about the standards' impact on the grid. The mid-Atlantic region and other parts of the country where the new regulations stood to have the biggest effect had ample power reserves, the agency found. While Texas and New England were in shakier condition, "the low reserve margins appear to have little to do" with EPA regulations.

Representatives of three top industry trade groups, the Edison Electric Institute, National Rural Electric Cooperative Association and American Public Power Association, either did not substantively respond or said they had no information when queried about the effects of MATS on their members. In a reversal that would have once seemed unfathomable, all opposed the Trump administration's decision last year to scrap the standards' legal underpinning. EPA now plans to restore it.

Lisa Jackson, who was EPA administrator when the MATS rule was finalized and is now with Apple Inc., was not available for an interview.

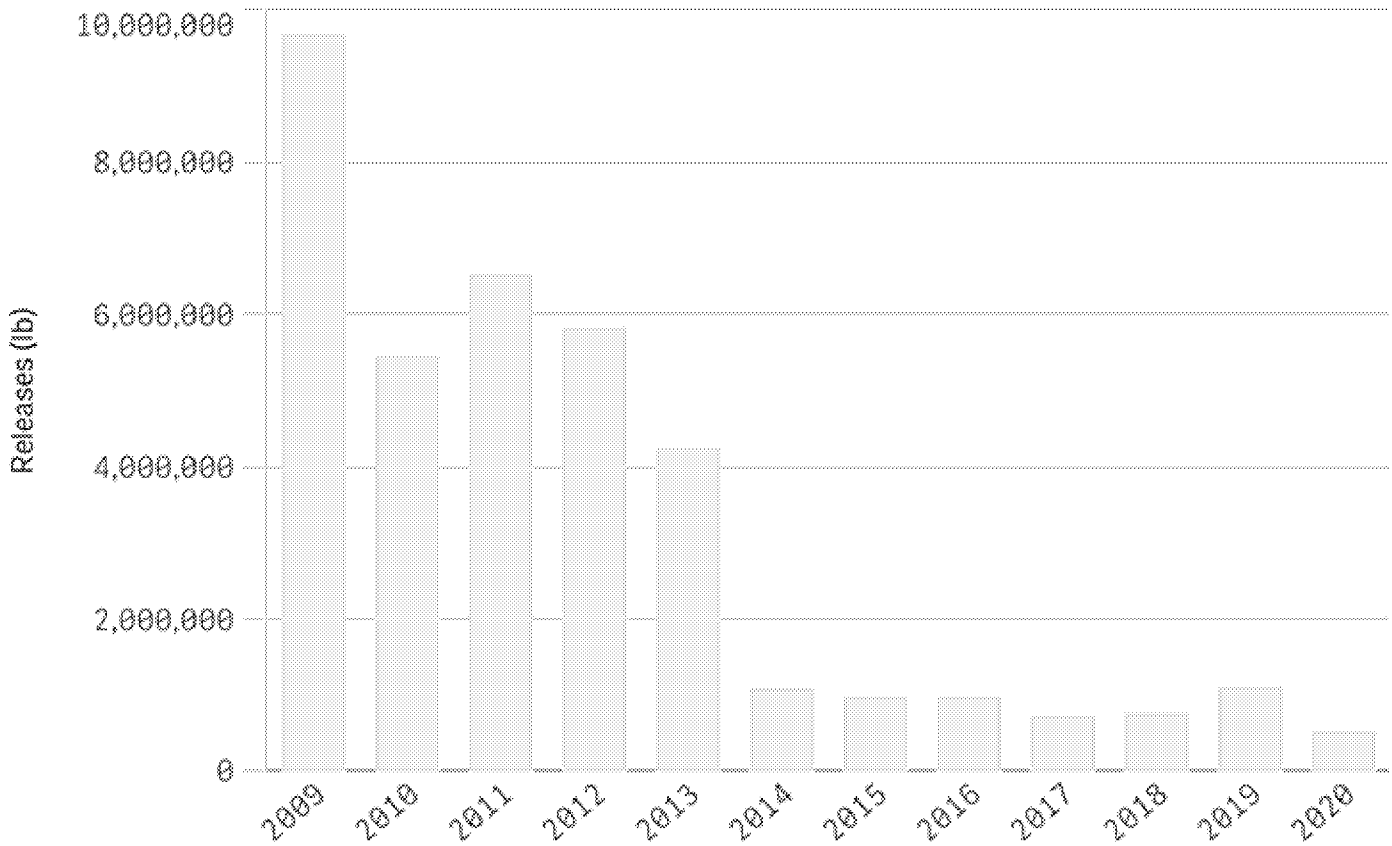
Tug of war

MATS's issuance capped a two-decade regulatory tug of war that originated with the 1990 Clean Air Act Amendments. Based on EPA projections of the expected health gains, tens of thousands of Americans had their lives cut short by toxic power plant pollution in the interim.

One of MATS's lessons is that "there are real costs to delay," said Jack Lienke, regulatory policy director at the liberal-leaning Institute for Policy Integrity, based at New York University. "And real benefits to the people who would rather that the rules not be issued at all."

Like other major industries covered by the 1990 amendments, the power sector was supposed to adopt “maximum achievable” controls to reduce releases of mercury, arsenic and other hazardous pollutants. But, EPA first had to conduct a study of the need for those controls and then officially declare that they were “appropriate and necessary.”

On-site Air Releases Over Time



At the coal-fired Monroe Power Plant in southeastern Michigan, air pollution releases have plunged more than 90% since 2009 as new state and federal regulations took hold, according to data reported to EPA's Toxics Release Inventory. | EPA

The special treatment was rooted in Congress’ decision to simultaneously limit coal-fired power plant pollution that spawned acid rain. As Supreme Court Justice Elena Kagan later wrote in an opinion, “that prospect counseled a ‘wait and see’ approach” aimed at determining whether those limits might also curb emissions of mercury and other hazardous pollutants from coal-fired facilities. But when EPA completed the required study in 1998, the results showed that those emissions were on track to climb by as much as 30 percent during the next decade, Kagan wrote.

The appropriate and necessary finding then followed in December 2000, a month before President Clinton left office. Under George W. Bush’s administration, EPA instead detoured to a cap-and-trade emissions strategy that critics objected would be far less effective in cutting power sector mercury releases. A federal appeals court rejected that approach in 2008; EPA then reaffirmed the 2000 finding when issuing the final standards three years later.

By that point, a broader reckoning was underway for the coal-burning electricity sector. Older facilities, which had initially been able to postpone installation of pollution controls, were facing new rules that, in Perciasepe's view, were intended to address "the real true cost of having a coal-fired power plant."

Conclusively disentangling the standards’ effect, however, from those of plummeting natural gas prices, tax credits to encourage more use of renewable energy source and other control measures is difficult — if not impossible.

"During the time period, there was just so much going on," said Paul Chu, senior technical executive at the Electric Power Research Institute, an industry think tank. "I'm sure if you ask three people, they'll give you three different perspectives."

But the cumulative impact can be seen in the emissions curve of Monroe Power Plant in southeastern Michigan, one of the nation's largest surviving coal-fired facilities. In 2011, the 3,300-megawatt plant belched more than 6.5 million pounds of sulfuric acid, mercury and other pollutants, according to data reported to EPA's Toxics Release Inventory by Detroit-based DTE Energy Co. By last year, that number was closer to 500,000 pounds — roughly a 90 percent drop.

MATS was a consideration, DTE spokesperson Eric Younan said in an email. But installation of scrubbers and another pollution control system at the Monroe plant had begun years earlier after EPA and Michigan regulators in the mid-2000s issued new rules for tackling ozone, fine particles and mercury, Younan said. All four of the plant's generating units were outfitted with those controls by 2014; because that cut emissions to levels that complied with the requirements of MATS, no other controls were needed, he added. The facility is now slated for retirement in 2040.

From: Goffman, Joseph <Goffman.Joseph@epa.gov>
Sent: Thursday, December 23, 2021 2:09 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>; Millett, John <Millett.John@epa.gov>
Subject: FW: Happy Birthday to MATS...

What do I have to do to get access to this article? Thanks.

Joseph Goffman
Principal Deputy Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

From: McCabe, Janet <McCabe.Janet@epa.gov>
Sent: Tuesday, December 21, 2021 2:59 PM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>; Tsirigotis, Peter <Tsirigotis.Peter@epa.gov>; Culligan, Kevin <Culligan.Kevin@epa.gov>; Stenhouse, Jeb <Stenhouse.Jeb@epa.gov>
Subject: Happy Birthday to MATS...

https://subscriber.politicopro.com/article/eenews/2021/12/21/how-epas-power-plant-rule-dodged-industry-fear-spreading-284504

Janet G. McCabe
Deputy Administrator, USEPA
1200 Pennsylvania Ave. NW 3412
Washington, DC 20460

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/13/2021 10:41:50 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Tuesday, December 14
Attachments: December Business Review Materials; The Future of Nuclear Energy 20211207.1.pptx; 2021 12 14 OAR Outreach on Climate Rules for the Power Sector - Briefing Memo 2.0.docx; 2021 12 14 OAR Outreach on Climate Rules for the Power Sector - Slides.pptx; LAB_Manufacturing OAR.12.14.2021.docx; 2 documents for tomorrow's meeting with Dan

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Tuesday, December 14, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	**14**	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

December 2021

Tue, Dec 14

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:15 AM	OAR Senior Staff
	10:15 AM – 11:00 AM	Decisional Briefing for Lead Acid Battery Manufacturing NESHAP and NSPS review proposals (Tier 3, SAN 8602 and 8603) (1 word doc)
	11:00 AM – 12:00 PM	Infrastructure Preparedness Planning
	12:00 PM – 12:30 PM	OTAQ Weekly
	12:30 PM – 1:00 PM	Hold: OH State Representatives Meeting
	1:00 PM – 1:30 PM	Weekly Check-In with Joe (1 email)
	1:30 PM – 2:00 PM	**Free**

■	2:00 PM – 3:00 PM	OAR Business Review (1 email)
■	3:00 PM – 3:30 PM	Video-call: Weekly Infrastructure Meeting
■	3:30 PM – 4:00 PM	The future of the Nuclear Energy (1 ppt)
■	4:00 PM – 5:00 PM	Video-call: Outreach on Climate Rules for the Power Sector (1 word doc, 1 ppt)
■	5:00 PM – 5:45 PM	San Joaquin Valley PM2.5 Small Check-in
■	5:45 PM – 6:15 PM	General Discussion
□	**After 6:15 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/10/2021 9:53:43 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Monday, December 13
Attachments: Coke-Ovens-RTR-EG-OAR-12-13-2021 (003).docx; CAA 111 GHG EGU BSER OAR 121321r.pptx; FOR YOUR INFORMAL REVIEW -GHG White Paper; For Weekend reading folders & review/comment by OOB Mon. 1) Cumulative Impacts White Paper & 2) NALS Action Plan

Additional Materials: ORD Cumulative impacts White Paper, and NALS Action Plan (1 email)

Goffman, Joseph Calendar
Goffman.Joseph@epa.gov
On Monday, December 13, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

December 2021

Mon, Dec 13

	Before 8:00 AM	**Free**
	8:00 AM – 8:30 AM	**Free**
	8:30 AM – 9:00 AM	Scheduling Meeting
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Air Issues Meeting
	10:00 AM – 10:30 AM	OAP Weekly
	10:30 AM – 11:30 AM	Early Guidance: Coke Ovens RTR Proposed Rules (Tier 2, SAN 8471) (1 word doc)
	11:30 AM – 12:00 PM	OAQPS Weekly
	12:00 PM – 1:00 PM	First Power Sector Biweekly (1 ppt)
	1:00 PM – 2:00 PM	Video-call: Weekly BID/BBB Implementation Steering Committee Meetings
	2:00 PM – 3:00 PM	Senior Staff Meeting

☐	**3:00 PM – 3:15 PM**	**Free**
■	3:15 PM – 5:00 PM	Hatch Act Training for EPA Political Appointees
■	5:00 PM – 5:45 PM	Informational White Paper on GHG Mitigation Options for New Combustion Turbine EGUs (1 email)
☐	**5:45 PM – 7:30 PM**	**Free**
■	7:30 PM – 8:00 PM	Video-call: General Discussion
☐	**After 8:00 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
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Pronouns: He/Him/His

Message

From: Thom Cmar [tcmar@environlaw.com]
Sent: 12/20/2021 10:00:56 PM
To: Regan, Michael [Regan.Michael@epa.gov]; Shore, Debra [Shore.Debra@epa.gov]
CC: Goffman, Joseph [Goffman.Joseph@epa.gov]; Prieto, Jeffrey [Prieto.Jeffrey@epa.gov]; Kaplan, Robert [kaplan.robert@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Mooney, John [Mooney.John@epa.gov]; Dave Altman [daltman@environlaw.com]; Justin Newman [jnewman@environlaw.com]; Megan Wachspress [megan.wachspress@sierraclub.org]
Subject: RE: letter supplementing petition for reconsideration of EPA-R05-OAR-2020-055
Attachments: Ex. A.pdf; Ex. B.pdf; Ex. C.pdf; Ex. D.pdf

Please find attached Exhibits A through D to the letter referenced in the email below. Thank you.

From: Thom Cmar
Sent: Monday, December 20, 2021 4:58 PM
To: 'Regan.Michael@epa.gov' <Regan.Michael@epa.gov>; 'Shore.Debra@epa.gov' <Shore.Debra@epa.gov>
Cc: 'Goffman.Joseph@epa.gov' <Goffman.Joseph@epa.gov>; 'Prieto.Jeffrey@epa.gov' <Prieto.Jeffrey@epa.gov>; 'Kaplan.Robert@epa.gov' <Kaplan.Robert@epa.gov>; 'Tsirigotis.Peter@epa.gov' <Tsirigotis.Peter@epa.gov>; 'Mooney.John@epa.gov' <Mooney.John@epa.gov>; Dave Altman <daltman@environlaw.com>; Justin Newman <jnewman@environlaw.com>; 'Megan Wachspress' <megan.wachspress@sierraclub.org>
Subject: letter supplementing petition for reconsideration of EPA-R05-OAR-2020-055

Dear Administrator Regan and Regional Administrator Shore,

Please find attached a letter submitted on behalf of petitioners Sierra Club, Ohio Environmental Council, Marilyn Wall, and Donna Ballinger, supplementing their January 18, 2021 petition for reconsideration of the U.S. Environmental Protection Agency's final rule, Air Plan Approval; Ohio; Technical Amendment, EPA-R05-OAR-2020-055, 85 Fed. Reg. 73,636 (Nov. 19, 2020).

Due to their file size, I will be sending the exhibits referenced in the letter under separate email cover.

Thank you in advance for your consideration of this letter.

Sincerely,

Thomas Cmar

Thomas Cmar
AltmanNewman Co., LPA
15 E. 8th St., Suite 200W
Cincinnati, OH 45202
(513) 721-2180 (office)
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EXHIBIT D

ALTMAN NEWMAN CO. LPA
Protecting Human Health & The Environment

VIA REGULATIONS.GOV AND EMAIL

U.S. Environmental Protection Agency, Region 5
Attn: Douglas Aburano, Chief
Attainment Planning and Maintenance Section
Air Programs Branch (AR-18J)
77 West Jackson Blvd.
Chicago, IL 60604
aburano.douglas@epa.gov

May 22, 2020

RE: Marilyn Wall and Donna Ballinger Comments Regarding the Proposed Removal of the Air Pollution Nuisance Rule from the Ohio State Implementation Plan (SIP), 85 Fed. Reg. 16309, (March 23, 2020), EPA Docket ID No. EPA–R05–OAR–2020–0055

We present these comments in opposition to the Environmental Protection Agency's (U.S. EPA) proposed removal of the air pollution nuisance rule (Ohio Admin. Code 3745-15-07) from Ohio's State Implementation Plan (SIP) (85 Fed. Reg. 16309 (March 23, 2020), EPA Docket ID No. EPA–R05–OAR–2020–0055) on behalf of Marilyn Wall, 816 Van Nes Drive, Glendale, Ohio 45246, and Donna Ballinger, 3014 Ottawa Street, Middletown, Ohio 45044.

On March 23, 2020—one day after Ohio's COVID-19 shutdown order was issued—the Federal Register announced that U.S. EPA intends to erase the 46-year-old Ohio Air Nuisance Rule (ANR) from Ohio's SIP (the Proposed Rule). The public was given 30 days, until April 22, to learn about this action and to muster a response—all during the unprecedented pandemic shut down. This firm sought a 60-day extension of the April 22 deadline and officially learned, on April 22, that federal officials had only granted a 30-day extension until today—May 22, 2020.

During the revised comment period there has been no opportunity for neighbors and community groups to learn about this action, to meet face-to-face to discuss its

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513 721 2180 environlaw.com

implications, or to even seek public records because public offices have been closed and unable to produce documents. Furthermore, the press has been understandably focused on the immediately life-threatening pandemic. These circumstances have had a particularly devastating impact on the rights of poor and minority communities to learn of U.S. EPA's proposed action and to comment on citizen concerns.

The proposed erasure of the ANR matters. It has been a substantive part of Ohio's SIP since 1974. The ANR provides site-specific control of criteria pollutants (NAAQS pollutants), such as particulate matter (PM) (today including PM 10 and PM 2.5), and was deliberately and purposely put in Ohio's SIP and has remained there throughout all renewals. See Declaration of William M. Auberle (attached as Exhibit 1). Dr. Auberle personally directly participated in the SIP development process in 1973 and 1974 as an advisor to the Director of the Ohio EPA, as the Chair of the Ohio Association of Local Air Pollution Control Officials, and as the head of the Regional Air Pollution Control Agency (RAPCA), where he was the founding supervisor. Ex. 1, ¶ 7-11. The ANR provision is so integral to the Ohio SIP that it has been included as a term in every Title V air permit issued in Ohio and in every air permit issued in Ohio for 46 years.

The provision is integral because the Ohio SIP provides that sources must not cause a NAAQS exceedance at the monitors and cannot emit NAAQS pollutants to such an extent as to cause a threat to health and welfare. At the very least, this additional SIP constraint on NAAQS pollutants provides a "safety net" to protect Ohio's people and their property. Such special controls are approved in state SIPs even if they only apply to specific facilities. Nuisance controls are certainly approvable if they are statewide controls. *Train v. Nat. Res. Def. Council, Inc.*, 421 U.S. 60, 79, 95 S. Ct. 1470 (1975); *Union Elec. Co. v. EPA*, 427 U.S. 246, 262-66, 96 S. Ct. 2518 (1976). However, this is not a case where the ANR was rejected for SIP inclusion; Ohio's ANR has been an approved part of Ohio's SIP for 46 years.

The Public's SIP Change Protections

States, of course, have the right to change their SIPs. If states want to make a change the federal process requires, among other things, reasonable public notice and a hearing within the state and requires the state to make specific showings, including an anti-backsliding demonstration. CAA Sections 110 and 193; 40 CFR Part 51, Appendix V. Ohio has never been able to make such a demonstration for removal of the ANR, and indeed, likely could not make such a demonstration for removal of the ANR. Further,

notice and hearing would make Ohio's communities—poor, rich and middle-class—aware of the proposed change to overturn decades of citizen participation with no discernible benefit. The only entities benefitting by removing the ANR are sources that will now be able to create nuisances with NAAQS pollutants without the threat of citizen enforcement. There is no record—at all—of abuse of citizen ANR enforcement in Ohio over the past 46 years. Instead, as shown below, the record demonstrates the benefits of citizen SIP enforcement.

Circumvention of Citizen Protection

In the face of these facts about the SIP and its ANR, the record of this Proposed Rule shows that Region 5 of the U.S. EPA "learned" that Ohio "still" had an air nuisance provision in its SIP and noted that other states in the Region did not, so Region 5 was going to "correct" this 46-year old purported error by removing the ANR from Ohio's SIP. The record states that the Region was taking this action to promote the novel doctrine of "regional consistency." Such a doctrine completely contradicts the well-established principle that SIPs are tailored by states to meet their specific air pollution needs and desired protections.

The other component of the record involves a two-part question posed to an Ohio EPA official by Region 5, *i.e.*, had the ANR ever been used by Ohio for NAAQS "attainment" or "maintenance" purposes? By return email, the state official answered "no" to the precise questions asked. There are at least three sets of major defects in the sparse record offered in support of the Proposed Rule.

First, in removing the 46-year old rule in this manner, the Region is making an illegal use of its CAA Section 110(k)(6) error correction authority. This is fully explained in the May 22, 2020 Sierra Club comments that were joined in by this firm and others. These comments are incorporated by reference in their entirety and attached to these comments as Exhibit 2.

Second, the public cannot precisely tell what the question asked by the Region means and what Ohio's answer means. Furthermore, Ohio's answer is contradicted by the Auberle Declaration, which says the ANR is, and has been for years, used for both NAAQS attainment and maintenance. Ex. 1, ¶ 8-13.

Third, both the purpose of the SIP, as recognized by the CAA in Section 110 and by the federal notice of the Proposed Rule, is "attainment, maintenance, ***and enforcement***..." of the NAAQS. Significantly absent from the question the Region asked of Ohio, and from Ohio's answer, is whether the ANR is used for SIP ***enforcement***. The Auberle declaration makes clear the ANR has been so used and a host of federal Ohio SIP enforcement actions shows the ANR continues to be so used. Hence, even if Ohio was correct that the ANR was not used for attainment or maintenance of the SIP — which is not accurate—the question about the use of the ANR for *enforcement* is absent from the record. Hence, the proposed action lacks a necessary material basis, even if it were otherwise legal, which it is not.

As a result, the Proposed Rule is not lawful and circumvents the Congressionally mandated protections to the public found in Section 110 and 40 CFR Part 51, including depriving the public of the requisite notice, hearing, and the required demonstrations that the Ohio EPA must make to revise the SIP. Therefore, the Region should withdraw or rescind the Proposed Rule.

ANR Enforcement

Congress intended citizen suits to be an integral part of CAA enforcement, including SIP enforcement. The following sampling of cases underscores the importance of the ANR to NAAQS enforcement over the years in Ohio.

- *Duren v. Worthington Custom Plastics*, No. 1:93-cv-0050 (S.D. Ohio, filed in 1993): Multi-media citizen suit included an ANR claim and was settled.
- *Hertzler v. Vernay Laboratories, Inc.*, No. 3:99-cv-451 (S.D. Ohio, filed in 1999): Multi-media citizen suit case included waste cleanup and nuisance claims and led to settlement that included enjoining future ANR violations.
- *Booth v. Georgia-Pacific Corp.*, No. 2:00-cv-0035 (S.D. Ohio, filed in 2000): Explosion/ANR class action/citizen suit led to appointment of expert air auditors to evaluate post-explosion operations.
- *Arnett and Environmental Community Organization v. Willard Industries, Inc.*, No. 1:02-cv-087 (S.D. Ohio, filed in 2002): ANR claim resolved by consent decree whereby facility agreed to cut fugitive emissions and reduce other air pollutants by 40%.

- *Fisher v. Perma-Fix of Dayton, Inc.*, No. 3:04-cv-418 (S.D. Ohio, filed in 2004): Citizen suit included ANR violations that led to a consent decree and supplemental federal agreement granting citizen oversight to eliminate ongoing ANR violations.

- *Graffs and Maddoxes v. Haverhill North Coke Company*, No. 1:09-cv-00670 (S.D. Ohio, filed in 2009): Defendants' sought to dismiss ANR claim, dismissal denied, and case ended in settlement.

- *Sampsons and Gannons v. SunCoke Energy, Inc.*, No. 1:17-cv-658 (S.D. Ohio, filed in 2017): ANR citizen suit still pending.

- *Ballinger and Sierra Club v. AK Steel - Middletown Works*: First citizen suit ANR notice filed in 2017 resulted in federal testing, which led to a **potential acute human health hazard** finding, which in turn led to state findings and orders. Follow up citizen suit notice was sent in August 2018 and the environmental problems are still unresolved.

- *State of Ohio and City of St. Bernard v. Phthalchem, Inc.*, No. A-8907973 (Hamilton County Court of Common Pleas, filed in 1989): Classic air nuisance case involving blue dyes and PM, compounded by the fact defendant was the largest unpermitted air facility in Ohio; ended in a consent decree and subsequent injunctions to abate nuisances.

However, such formal litigation is the tip of the iceberg of the importance of the ANR to SIP enforcement, as the Auberle Declaration points out. Ex. 1, ¶ 8. Working with facility neighbors, Sierra Club and other local environmental groups have used the ANR to secure changes that reduce air pollution from local plants, including:

- PMC Specialties Group, Inc. – Around 1993, Sierra Club, Ohio Citizen Action (OCA), and the Environmental Community Organization (ECO) worked with facility neighbors who complained about emissions to get PMC to install scrubbers and upgrade equipment.

- Morton International (acquired by Rohm & Haas, 1999) – Sierra Club and OCA worked with citizens who complained about facility emissions to successfully pressure Morton to redo their pump system, which was a significant air source.

Sierra Club also cited the ANR in following up on community air complaints about Celotex and various asphalt plants, including Valley Asphalt, in the 1990s and 2000s.

In addition, in the early 2000s, the regional air agency, SWOAQA, and Ohio EPA used a survey they conducted near AK Middletown Works to document the facility was a nuisance as part of a lawsuit in which Sierra Club was an intervenor plaintiff (*United States v. AK Steel Corp.*, S.D. Ohio No. C-1-00530); hundreds of tons of particulate were eliminated.

The Proposed Rule would terminate such ANR/SIP citizen suit enforcement.

Uniquely Bad Time to Circumvent Citizen Protection

The continuing pandemic, with its uncertain future, is a uniquely bad time to rescind any rule that exacerbates the threat of the novel coronavirus and the COVID-19 disease. As noted, one of NAAQS pollutants is PM, which today includes PM 10 and PM 2.5. A Harvard study, attached as Exhibit 3, shows a 15% increased mortality rate for those who are exposed to the novel coronavirus and are also exposed to increased concentrations of PM 2.5. This type of threat to human health is uniquely enforceable as part of the SIP by the ANR in Ohio. Other research suggests that concentrations of the novel coronavirus may literally be spread in a more concentrated form by attaching themselves to the small PM particles, which go deep into the lungs, as shown by research in Bologna, Italy that analyzed the environmental component of the rapid and intense spread of the novel coronavirus in northern Italy. See Exhibit 4.

Conclusion

Since Region 5 is: (a) misapplying its error-correction authority in Section 110(k)(6); (b) ignoring a necessary and material basis for its proposed action, even if it were otherwise legal; and (c) imposing a SIP change on a state, thereby circumventing citizen protective rights in Section 110, the Proposed Rule should be withdrawn or rescinded.

Commenters

Marilyn Wall has spent decades involved with local, regional and state-wide education on air, water, and waste disposal issues. She is the past chair of the Miami Group of the Sierra Club, the Ohio Chapter of the Sierra Club, and of the Environmental Community Organization (ECO), has served on governmental advisory boards, and has served on the national Board of the Sierra Club. She personally participated in ANR litigation, including cases involving Willard Industries and AK Steel, and utilized the ANR in problem-solving discussions with PMC Specialties Group, Inc. and Morton International.

Donna Ballinger lives near the furnaces and aging coke ovens at the AK Steel Middletown Works facility and has diligently sought enforcement of CAA violations, especially PM violations.

AltmanNewman Co. LPA is a private, public interest law firm based in Cincinnati, Ohio focusing on individual and community enforcement of state and federal environmental laws. The firm was trial counsel in the enforcement cases listed above and in many other environmental cases.

Comments submitted on behalf of Marilyn Wall and Donna Ballinger by:

/s/ D. David Altman

D. David Altman
AltmanNewman Co. LPA
15 E. 8th St., Suite 200W
Cincinnati, OH 45202
(513) 721-2180
daltman@environlaw.com

EXHIBIT 1

DECLARATION OF WILLIAM M. AUBERLE

I, William M. Auberle, declare as follows:

1. I am over 18 years of age and of sound mind.

2. I have personal knowledge of the information set forth herein.

3. I am a Professor Emeritus of Civil and Environmental Engineering at Northern Arizona University and a Principal at EN3 Professionals, LLC. I have been practicing environmental engineering with a principal emphasis on air pollution engineering for more than 50 years as a regulatory official, consulting engineer and academic.

4. During my career, I have served as a consultant to governments, industries, courts, and communities.

5. I have served on a number of advisory boards to federal agencies and state and local governments, including gubernatorial task forces. I was appointed to and served seven terms as a member of USEPA's Clean Air Act Advisory Committee during the Clinton, Bush and Obama administrations.

6. I am a licensed professional engineer in Louisiana, Ohio, Michigan and Arizona, and am Board certified in air pollution engineering by the American Academy of Environmental Engineers and Scientists. I have an LHD from Northern Arizona University.

7. From 1970 to 1977, I was the founding Supervisor of the Regional Air Pollution Control Agency (RAPCA), the regional air pollution control agency which serves a six-county region in the Dayton-Springfield, Ohio area.

8. During my service with RAPCA, I participated in writing and enforcing a wide range of air pollution control laws, regulations and ordinances. These included air pollution nuisance limitations. Following creation of the Ohio EPA, I used Ohio's updated Air Nuisance Rule (ANR) and permit conditions to enforce the federal Clean Air Act. More specifically, I used the ANR as an enforcement tool (and deterrent to violations) for achieving and maintaining the National Ambient Air Quality Standards (NAAQS), including particulate matter (PM).

9. As Supervisor of RAPCA, I directly served as an advisor to the Director of the Ohio EPA, once the agency was created by Governor Gilligan. This included working as the arm of the Ohio EPA in the RAPCA area and serving on Ohio EPA task forces and committees.

10. I have direct, firsthand knowledge of the inclusion of the ANR in Ohio's State Implementation Plan (SIP). As Supervisor of RAPCA I directly participated in

discussions and development of the Ohio SIP. Additionally, I served as a founding member and Chair of the Ohio Association of Local Air Pollution Control Officials, which advised the Ohio EPA on SIP development, including the inclusion of the ANR in the Ohio SIP.

11. From the outset of Ohio's SIP development process, inclusion of the ANR was purposeful and important to Ohio's air pollution control officials, including myself. Achieving NAAQS was vitally important to protect the health and welfare of our citizens. Multiple Ohio communities, including those served by RAPCA, faced the challenge of reducing air pollutant emissions to achieve and maintain these standards. The ANR was an important regulatory tool in this process. Throughout my career, including my seven terms as a member of the USEPA's Clean Air Act Advisory Committee, I have followed the progress of Clean Air Act implementation in Ohio.

12. I have also continued to apply the ANR as an engineering and air pollution control consultant and as an expert witness in state and federal court cases. I am aware that since the inclusion of the ANR in the original Ohio SIP, it has continued to be included in every SIP renewal, including in 2012 and in 2017. Thus, the ANR, since 1974, has been a necessary element of the SIP. It is important in achieving and maintaining the NAAQS, and to protecting the health and welfare of the people of Ohio.

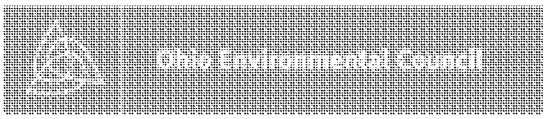
13. The ANR remains an integral part of the Ohio SIP. Specific federal and state air pollution control requirements to achieve and maintain the NAAQS continue to evolve as NAAQS are modified and better emissions control technologies develop. These advances, however, do not address some specific air pollution conditions. In these circumstances applying, and complying with, the Ohio ANR is important to protecting the health and welfare of the affected citizens.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 21st day of May 2020.

William M. Auberle

EXHIBIT 2



May 22, 2020

Via Regulations.gov and E-mail

U.S. Environmental Protection Agency, Region 5
Attainment Planning and Maintenance Section
Air Programs Branch (AR-18J)
77 West Jackson Blvd.
Chicago, IL 60604
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Re: Sierra Club, Ohio Environmental Council, Ohio Citizen Action, AltmanNewman Co. LPA, and Natural Resources Defense Council Comments Regarding EPA Proposed Removal of the Air Pollution Nuisance Rule from the Ohio State Implementation Plan (SIP), 85 Fed. Reg. 16309, (March 23, 2020), EPA Docket ID No. EPA–R05–OAR–2020–0055

Sierra Club, Ohio Environmental Council, Ohio Citizen Action, CERES, AltmanNewman Co. LPA, and Natural Resources Defense Council respectfully submit the following comments regarding the Environmental Protection Agency's (U.S. EPA) proposed removal of the air pollution nuisance rule (Ohio Admin. Code 3745-15-07) from the Ohio State Implementation Plan (SIP), 85 Fed. Reg. 16309 (March 23, 2020), EPA Docket ID No. EPA–R05–OAR–2020–0055. Descriptions of the commenters can be found in Section IV, below.

U.S. EPA cannot enact a substantive change in Ohio's State Implementation Plan under the guise of the Clean Air Act's error correction mechanism, thereby bypassing the public procedural steps and substantive showings otherwise required for such a change. A narrow exception to these requirements and the Clean Air Act's cooperative federalism mandate, 42 U.S.C. §7410(k)(6), allows the U.S. EPA to make changes to a SIP *only* where the U.S. EPA identifies an "error" in its prior approval and explains the nature of such error. The approval of Ohio's air pollution nuisance provision was not an error. Ohio lawfully chose to protect its residents from air pollution by reliance on a qualitative standard that may be, at least in some circumstances, more protective than the NAAQS. The U.S. EPA then expressly and specifically considered this provision and approved its inclusion and federal enforceability, not once but

twice: in 1984 and again in 2012. When both agencies have repeatedly re-affirmed the validity of this provision, the U.S. EPA cannot remove it from the SIP under the guise of error correction. The Third Circuit addressed a similar proposed change to the Pennsylvania SIP and pointedly found that a "change in policy" by the EPA is not a "correction[]," and must be made in accordance with the statutorily specified means for SIP modification and in cooperation with the state. *See Concerned Citizens of Bridesburg v. U.S. E.P.A.*, 836 F.2d 777 (3d Cir. 1987).

Even if the Proposed Rule were procedurally sound—which it is not—the proposed elimination of the air pollution nuisance provision is misguided and would undermine enforcement of the Clean Air Act in Ohio. U.S. EPA's justification for the Proposed Rule ignores the crucial role of citizen suits in enforcing the Clean Air Act. U.S. EPA represents that the Ohio EPA has stated that it has not and does not intend to rely on Ohio Admin. Code 3745-15-07 for attainment and maintenance purposes. But this statement is irrelevant to whether the provision was included in the SIP by "error." It also fails to account for the fact that individual litigants have used the air pollution nuisance provision to bring citizen enforcement actions which have prompted U.S. EPA intervention and significant changes to polluters' practices enforced by consent decrees. The air pollution nuisance rule provides a legal mechanism by which people who suffer significant harm from pollutants can seek to limit or halt those emissions where the harms are qualitative, where the individuals who suffer those harms do not have access to the technology or information necessary to establish numerical exceedances, or where the burdens of those emissions are disproportionately felt by people in close proximity to the source. The emissions prohibited by this rule include the criteria pollutants for which regional NAAQS exist, and compliance with the air pollution rule is a standard term in Ohio's air permits, making Ohio Admin. Code 3745-15-07 an important mechanism for limiting pollution by individual sites and thereby promoting attainment throughout the state. Finally, because low-income households and people of color are more likely to live in close proximity to major stationary sources of air pollution, the air pollution nuisance rule is an important tool for bringing about environmental justice within Ohio. The U.S. EPA cannot lawfully, and should not, finalize the Proposed Rule.

I. Background

Ohio's air pollution nuisance rule, codified at Ohio Admin. Code 3745-15-07, makes it unlawful to permit or maintain any "public nuisance," defined as "[t]he emission or escape into the open air from any source or sources whatsoever, of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, or any other substances or combinations of substances, in such manner or in such amounts as to endanger the health, safety or welfare of the public, or cause unreasonable injury or damage to property." Ohio Admin. Code 3745-15-07(A). Under current law, any person or agency authorized to enforce Ohio's SIP—including through the citizen suit provisions of the Clean Air Act, 42 U.S.C. §7604—may bring a Clean Air Act enforcement action against a person or entity permitting or maintaining an air pollution public nuisance, as defined.

The air pollution nuisance rule has been part of Ohio's SIP since it was first approved in 1974 (then codified at AP-2-07).[1] The provision has been in place continuously since 1974, undergoing only two minor revisions. In 1984, the U.S. EPA approved a revision to "includ[e] an exemption for sources of odor which are not currently regulated under other portions of the SIP" and to remove references to "comfort" and "related terms and phrases." *Id.* The U.S. EPA promulgated a final rule effectuating this specific revision without any suggestion that the provision or its prior version contained an error. The Ohio EPA made stylistic changes to Ohio Admin. Code 3745-15-07 as part of Ohio's five-year review in 2014 which became effective in July 2015;[2] at no point during this review process did the Ohio EPA suggest the provision was included in the SIP in error, and specifically rejected comments urging its removal.

U.S. EPA now proposes to remove Ohio Admin. Code 3745-15-07 from Ohio's SIP outside of the usual SIP revision process and without any findings as to the provision's importance for Ohio's air quality, codifying this removal by revising 40 C.F.R. Part 52, subpart KK, §52.1870. 85 Fed. Reg. 16309-10 (March 23, 2020). The Proposed Rule relies on 42 U.S.C. §7410(k)(6) for the statutory authority to make this change. That provision permits the

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[1] Ohio's first State Implementation Plan was initially approved by the EPA pursuant to Section 110 of the Clean Air Act (codified at 42 U.S. § 7410) on May 31, 1972. 37 FR 0842. After the approval was vacated by the Sixth Circuit in *Buckeye Power, Inc. v. U.S. EPA*, 481 F.2d 162 (6th Cir. 1973), Ohio revised the plan, which was reapproved by the EPA on April 15, 1974. 39 FR 13542-03. The air pollution nuisance rule was included as part of Ohio's 1974 SIP (then codified at AP-2-07). 49 Fed. Reg. 32181-01.

[2] The amendments adopted through the five-year review process and effective as of July 20, 2015 are as follows (with changes from the version in effect from 1984 through 2015 shown):

> (A) ~~Except as provided in paragraph (B) of this rule, the~~ The emission or escape into the open air from any source or sources whatsoever, of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, ~~odors,~~ or any other substances or combinations of substances, in such manner or in such amounts as to endanger the health, safety or welfare of the public, or cause unreasonable injury or damage to property, is hereby found and declared to be a public nuisance. It shall be unlawful for any person to cause, permit or maintain any such public nuisance.
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> (B) ~~Those~~ The emission or escape into the open air from any source or sources of odors ~~not~~ whatsoever that is subject to regulation under Chapter 3745-17, 3745-18, 3745-21, or 3745-31 of the Administrative Code ~~shall not be subject to this rule.~~ and is operated in such a manner to emit such amounts of odor as to endanger the health, safety, or welfare of the public, or cause unreasonable injury or damage to property, is hereby found and declared to be a public nuisance. It shall be unlawful for any person to cause, permit or maintain any such public nuisance.

EPA to "revise [an] action" if the EPA "determines that the…action approving, disapproving, or promulgating any plan or plan revision (or part thereof)…was in error." The Proposed Rule states that the EPA now "finds that its prior approval of Ohio Admin. Code 3745-15-07 into the Ohio SIP was in error" because the provision purportedly "does not have a reasonable connection to the attainment and maintenance of the NAAQS." 85 Fed. Reg. at 16310. If the Proposed Rule is finalized the air pollution nuisance rule will no longer be federally enforceable as a provision of Ohio's SIP, including by Clean Air Act citizen suits.

II. The Air Pollution Nuisance Rule Was Not Included in "Error" and the Nuisance Provision Provides Valuable Protections to Ohio Communities.

The Proposed Rule is both procedurally unlawful and substantively harmful. The EPA's purported basis for concluding Ohio Admin. Code 3745-15-07 was approved by the EPA in error is contradicted by the administrative history of the provision. The Proposed Rule's claim that the Ohio EPA has not relied on the provision for attainment or maintenance, even if relevant to whether its inclusion in the SIP was an "error," ignores Congressional intent and decades of history affirming the important role of citizen suits in *enforcing* the Clean Air Act. In addition to being procedurally unlawful and arbitrary, the proposed elimination of Ohio Admin. Code 3745-15-07 would be damaging to the health and safety of Ohioans, particularly those in environmental justice communities. The EPA should rescind the Proposed Rule.

A. The U.S. EPA cannot lawfully eliminate Ohio Admin. Code 3745-15-07 from Ohio's State Implementation Plan through the Clean Air Act's error correction mechanism.

Through the Proposed Rule, the U.S. EPA is attempting to unilaterally impose a substantive policy change to Ohio's SIP, bypassing the Ohio EPA, and ignoring the process required for such changes under the Clean Air Act. The nuisance provision has been part of the Ohio SIP since it was first approved by U.S. EPA in 1974. The Ohio EPA has proposed, and the U.S. EPA has approved, revisions to the provision while retaining its core language *twice*: first to carve out odors in 1984 (a change approved by the EPA) and second, to make stylistic changes to that same odor exception in 2015 as part of Ohio EPA's five-year review process. Most significantly, Ohio Admin. Code 3745-15-07 has been repeatedly reaffirmed as federally enforceable by the U.S. EPA, including as recently as 2012. It defies logic to conclude that several U.S. EPA and Ohio EPA administrations would tweak a provision that they believed was included in error in the SIP. The U.S. EPA's approval of Ohio Admin. Code 3745-15-07 as part of Ohio's SIP was not an error. By nevertheless seeking to strip a longstanding citizen enforcement provision from Ohio law under the guise of "error correction," the U.S. EPA is attempting to circumvent SIP revision procedures, avoid making findings as to the legal or scientific justification for eliminating the nuisance provision, and bypass the Ohio EPA's statutory role in drafting its own SIP. This is an abuse of discretion and unlawful.

1. The inclusion of Ohio Admin. Code 3745-15-07 in Ohio's SIP was intentional and lawful and has been repeatedly reaffirmed as such by the EPA.

A State Implementation Plan, once approved, may not be unilaterally modified by either the State *or* the U.S. EPA. *See* 42 U.S.C. §7410(i). Section 110 of the Clean Air Act, as revised in 1990, requires collaboration between States and the U.S. EPA in any modification of approved SIPs, whether through state-initiated modifications (*see* 42 U.S.C. §7410(a)(1), (2)(H)) or a "SIP call" initiated by the U.S. EPA (*see* 42 U.S.C. §7410(k)(5)). If the EPA finds that a SIP does not comply with the requirements of the Clean Air Act, it may make a "SIP call" to allow the State, in the first instance, to address the purported inadequacies of the standing SIP. *See id.* §7410(k)(5).

A narrow exception to these requirements, §7410(k)(6), authorizes the U.S. EPA to revise a plan where *the EPA* has erred in "approving, disapproving, or promulgating" any SIP. Section 7410(k)(6) of the Clean Air Act authorizes EPA to revise area designations "[w]henever the Administrator determines that the Administrator's action . . . was in error" so long as "[s]uch determination and the basis thereof [are] provided to the State and public." 42 U.S.C. § 7410(k)(6).

The Proposed Rule states that the U.S. EPA erred when it approved the inclusion of Ohio Admin. Code 3745-15-07 in Ohio's SIP because the nuisance provision "does not have a reasonable connection to the attainment and maintenance of the NAAQS." 85 Fed. Reg. at 16,310. This revision is not error correction, but a substantive change in the U.S. EPA's policy with respect to this provision. Neither the Clean Air Act nor any court requires such a "reasonable connection" to the NAAQS for inclusion in the SIP. To the contrary, it is well established that "states may submit implementation plans more stringent than federal law requires and that the Administrator must approve such plans if they meet the minimum requirements of §110(a)(2)…" *Union Elec. Co. v. E.P.A.*, 427 U.S. 246, 265 (1976); *see also* 42 U.S.C. §7416.[3] States may also include, and individuals enforce through citizen suits, SIP provisions which ensure the continued usability of shared resources or which prohibits emissions that run afoul of qualitative or non-numerical standards. *See Save Our Health Org. v. Recomp of Minnesota, Inc.,* 829 F. Supp. 288, 291 (D. Minn. 1993), *aff'd*, 37 F.3d 1334 (8th Cir. 1994) (EPA did not exceed its authority in approving SIP that included odor regulations); *see also PUD No. 1 of Jefferson Cty. v. Washington Dep't of Ecology*, 511 U.S. 700, 716-18 (1994) (state water

[3] "[N]othing in this chapter shall preclude or deny the right of any State or political subdivision thereof to adopt or enforce (1) any standard or limitation respecting emissions of air pollutants or (2) any requirement respecting control or abatement of air pollution; except that if an emission standard or limitation is in effect under an applicable implementation plan or under section 7411 or section 7412 of this title, such State or political subdivision may not adopt or enforce any emission standard or limitation which is less stringent than the standard or limitation under such plan or section."

quality standards that include "broad, narrative terms" or protect designated uses are federally enforceable under the Clean Water Act); *Northwest Environmental Advocates v. City of Portland*, 56 F.3d 979, 988-89 (9th Cir. 1995) (en banc) (citizen suits can be brought to enforce non-numerical standards for water quality under the Clean Water Act). Moreover, criteria pollutants are regulated by the air pollution nuisance rule—which, applied to individual polluters through permits, limits each source of pollutants so as to promote regional attainment.

Ohio acted lawfully when it included a nuisance provision as part of its SIP, and the EPA was required to approve its inclusion if the SIP otherwise met requirements under federal law. *See Train v. Nat. Res. Def. Council, Inc.*, 421 U.S. 60, 79 95 S. Ct. 1470 (1975). Once Ohio chose to include such a provision, the U.S. EPA cannot unilaterally eliminate it on the grounds that it is unrelated to the NAAQS under the auspices of error correction.

Indeed, under a closely analogous set of circumstances, the Third Circuit squarely rejected the EPA's attempt to use "error correction" as a means of eliminating a qualitative standard from a state SIP where the EPA's policy toward such provisions had changed. Pennsylvania's 1972 SIP included regulations addressing odors; the EPA approved and took action with respect to the SIP on two additional occasions "without objecting" to these odor regulations. *Concerned Citizens of Bridesburg v. U.S. E.P.A.*, 836 F.2d 777, 781 (3d Cir. 1987).[4] In 1980, the U.S. EPA changed its policy toward odor regulations within SIPs. *Id.* at 782. However, after a citizen group brought suit to enforce these provisions of Pennsylvania's SIP, the U.S. EPA published notice of its (unilateral) intent to eliminate these provisions. *Id.* As here, the U.S. EPA maintained that the regulations "bore 'no relation to attainment or maintenance of the [NAAQS]'" and eliminating this provision was "merely a correction of an EPA error" made in the original approval of the SIP. *Id.* 780, 782. The Third Circuit rejected the suggestion that the EPA's approval of the provision was "inadvertent" and held that the U.S. EPA's unilateral removal of the provision was unlawful. *Id.* at 786. Instead, the Third Circuit held, a "change in policy" by the U.S. EPA is not a "correction[]," and must be effectuated through the statutorily specified means of revising a SIP and in cooperation with the relevant state. *Id.*

As in *Concerned Citizens of Bridesburg*, the "error correction" the U.S. EPA is attempting here is in fact a thinly disguised shift in policy. The Proposed Rule states that the

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[4] Although the *Concerned Citizens of Bridesburg* pre-dates the addition of §7410(k)(6) (itself a part of the 1990 Clean Air Act revisions), the Court in that case recognized even in the absence of explicit statutory permission that the EPA has the authority to engage in genuine error correction, but still held that a "clear change in policy" as to whether a provision is sufficiently related to the NAAQS is not an "error." No court has called the holding of *Concerned Citizens of Bridesburg* into question in light of the 1990 Clean Air Act revisions. To the contrary, it has been cited approvingly since the addition of §7410(k)(6), in *Save Our Health Org. v. Recomp of Minnesota, Inc.*, 829 F. Supp. 288 (D. Minn. 1993), aff'd, 37 F.3d 1334 (8th Cir. 1994).

EPA "approved many … elements into the SIP with minimal review," and that it now "recognize[s] that some of these elements are … not [appropriate] as federally enforceable SIP requirements," including "rules that prohibit air pollution nuisances" which "generally have no connection to the purposes for which SIPs are developed and approved." 85 FR 16309. The EPA therefore concludes that "its prior approval of Ohio Admin. Code 3745-15-07 into the Ohio SIP was in error." *Id.* at 16310. But the U.S. EPA repeatedly reaffirmed the lawfulness of the inclusion of Ohio Admin. Code 3745-15-07 in Ohio's SIP and its federal enforceability. This proves the fallacy of U.S. EPA's suggestion that it only gave Ohio Admin. Code 3745-15-07 cursory review when approving it as part Ohio's original SIP in 1974.

In 1984, the Ohio EPA submitted, and the U.S. EPA approved, revisions to Ohio Admin. Code 3745-15-07. 49 FR 32181-01 (Aug. 13, 1984). The air pollution nuisance provision was the *only* provision of the SIP altered by this particular revision, and discussed in the preamble and promulgated Final Rule by the U.S. EPA. The revised version submitted by the Ohio EPA and approved by the U.S. EPA was, in relevant part, identical to the current version.[5] *Id.*

In 1999 and 2012, the EPA reaffirmed its position that the nuisance provision was federally enforceable as it was appropriately included in the Ohio SIP. *See* June 18, Letter from Region 5 to Ohio EPA, attached as Exhibit 1 ("1999 Letter"); April 25, 2012 Letter from Region 5 to Ohio EPA, attached as Exhibit 2 ("2012 Letter"). In 1999, the U.S. EPA wrote to the Ohio EPA to advise that, *inter alia*, the EPA would object to any Title V permits with any "nuisance…terms and conditions that are misrepresented as State-only enforceable" and stating that the Ohio EPA, if it wished to remove the nuisance provision from permits in the future, must prepare a SIP revision package for EPA approval. 1999 Letter at p. 2.[6] In 2012, the Ohio EPA

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[5] Subsection (A) of both the 1984 and current version of Ohio Admin. Code 3745-15-07 defines emission-based public nuisances in general and makes it unlawful; subsection (B) of both the 1984 and current version of Ohio Admin. Code 3745-15-07 make odors subject to regulation under other provisions that meet the public nuisance standard unlawful. The text of subsection (A) other than an exception for odors and the odor provisions are identical between the two versions. The 1984 revision added an exemption for odors not otherwise regulated by the SIP to the air pollution nuisance provision and deleted references to "comfort" and similar words. *See id.*

[6] As the 1999 Letter also points out the anti-backsliding provision of 42 U.S.C. §7515 precludes U.S. EPA from approving any revised SIP that modifies any "control requirement in effect…before November 15, 1990, in any area which is a nonattainment area for any air pollutant…unless the modification insures equivalent or greater emission reductions of such air pollutant." 1999 Letter at 1. Numerous Ohio counties are nonattainment areas for air pollutants to which the air pollution nuisance provision applies, *see* https://www3.epa.gov/airquality/greenbook/anayo_oh.html, and Ohio has not made the requisite showing that elimination of the air pollution nuisance provision would meet this standard. By attempting to eliminate this pre-1990 anti-nuisance provision through error correction, the U.S.

wrote to the U.S. EPA for clarification as to whether §3745-15-07 was federally enforceable. The Chief of the Air Permits Section for Region 5 replied, on behalf of the U.S. EPA: "Upon re-examining the underlying regulations, Section 504(a) of the CAA, and 40 C.F.R. § 70.2, we reaffirm our position that, because EPA has approved it into the Ohio SIP, Ohio Admin. Code 3745-15-07 is a federally enforceable permit term for purposes of Title V permits." *Id.*

For its part, the Ohio EPA has closely considered and decided to retain Ohio Admin. Code 3745-15-07 as part of its SIP even more recently. As part of its 2014 five-year review of the SIP, Ohio EPA made clarifying changes to Ohio Admin. Code 3745-15-07 "without changing [its] intent." *See* Rule Package: OAC Chapter 3745-15, "General Provisions on Air Pollution Control" Response to Comments, IP draft, dated February 2015, attached as Exhibit 3 ("Response to Comments"). In response to a Comment arguing the Ohio EPA should remove the provision from the "federal side" of the SIP and associated permits, the Ohio EPA responded that it would "take [the] comment into consideration when determining if Ohio will request U.S. EPA to reconsider Ohio's nuisance rule." Ohio has made no such request or made the required SIP modification showing in the intervening five years.

Past actions and statements by both the U.S. and Ohio EPA thus amply demonstrate that the inclusion and approval of Ohio Admin. Code 3745-15-07 was intentional and fully considered, that the U.S. EPA has specifically considered and determined the provision was federally enforceable, and that Ohio EPA, far from viewing the provision as extraneous, undertook a public process to clarify statutory intent. What the U.S. EPA now characterizes as "error correction" is a change in policy. "[A] change in policy does not in and of itself indicate that the prior enforcement policy was erroneous." *Alabama Envtl. Council v. Adm'r, U.S. E.P.A.*, 711 F.3d 1277, 1290 n. 14 (11th Cir. 2013). The U.S. EPA cannot reverse its substantive position on the federal enforceability of this provision, or brush aside the Ohio EPA's important role in SIP revision, by falsely characterizing this change as an "error correction."

2. The Proposed Rule lacks any basis for its assertion that the air pollution nuisance provision in Ohio's SIP was approved in error and thus fails to meet the plain text requirements for application of 42 U.S.C. §7410(k)(6)

The Proposed Rule reflects a change in the U.S. EPA's *substantive* position on the appropriateness of nuisance provisions in Ohio's SIP. But even if there were not affirmative evidence of a substantive change in the U.S. EPA's position (which cannot, per *Concerned Citizens of Bridesburg*, be effectuated via "error correction"), there is no legal or evidentiary support for the Proposed Rule's assertion that the original approval of Ohio Admin. Code 3745-15-07 was an *error*. In the absence of any basis for its purported determination that the U.S. EPA erred in approving the nuisance provision in 1974, the Proposed Rule is unlawful.

EPA is failing to comply with an anti-backsliding standard which it had earlier advised Ohio EPA it would have to meet before making the same change.

To rely on §7410(k)(6) as the basis for a SIP revision, the U.S. EPA must "articulate an 'error' and provide 'the basis' of its determination that an error occurred." *Alabama Envtl. Council*, 711 F.3d at 1287. If the EPA is unable to "point to a determination of the error committed" in its prior action, it cannot proceed under §7410(k)(6). *Id.* That error must have occurred *at the time* the U.S. EPA approved the provision it now seeks to revise. *Id.*

The Proposed Rule provides no such basis or determination. The EPA's view that nuisance provisions are "generally" insufficiently related to the purposes of SIPs, and assertion that "many" provisions in SIPs in the 1970s and 1980s were approved with "minimal review" does not "point to a determination" of any error, nor does it offer any "basis" for its determination that the inclusion of Ohio Admin. Code 3745-15-07, specifically, was erroneous. The Proposed Rule cites no record in the history of Ohio's SIP to support the conclusion that the EPA missed or otherwise neglected to review this specific provision—and even fails to articulate that *this* provision (as opposed to an amorphous category of "elements" of SIPs approved during a two-decade period) was specifically overlooked. Moreover—as discussed above—even if the provision had been overlooked in 1974, the U.S. EPA later approved a revised version of the provision in 1984 as a standalone Final Rule, undermining this claim of oversight.

Nor does the Proposed Rule offer any basis, whether in federal regulations or judicial decisions, to support the U.S. EPA's position that nuisance provisions *in general* do not serve the purposes for which SIPs are developed and that this lack of connection makes the inclusion of Ohio Admin. Code 3745-15-07 unlawful. In fact there is no support for this assertion. NAAQS set the floor, not the ceiling, of lawful standards within a SIP, and additional standards may be qualitative. And as explained in greater detail below, these provisions do facilitate citizen suits that ensure the protections of the Clean Air Act are enforced, either directly or by prompting agency action, and by enabling people to bring suit against polluters directly to bring their emissions in conformity with *regional* NAAQS.

The Proposed Rule does not offer any evidence that the U.S. EPA overlooked *this specific provision* in 1974, or any legal basis for concluding its prior approval was unlawful. To the contrary, the U.S. EPA is now attempting to do what the Third Circuit said it could not in *Concerned Citizens of Bridesburg*. Having apparently changed its substantive position on the inclusion of Ohio Admin. Code 3745-15-07 in Ohio's federally enforceable SIP, the U.S. EPA is attempting to remove a citizen enforcement provision through unilateral "error correction" on the grounds that the provision does not sufficiently relate to NAAQS. But the air pollution nuisance provision *does* on its face regulate criteria pollutants and—as explained in greater detail below—contributes to the attainment of the NAAQS by facilitating citizen suits against individual polluters whose emissions contribute to regional levels. The Clean Air Act does not authorize the U.S. EPA to abuse the Clean Air Act's error correction provision in this way.

B. The Proposed Rule ignores the important role of citizen suits in Clean Air Act enforcement.

The Proposed Rule arbitrarily and improperly ignores the importance of Ohio Admin. Code 3745-15-07 for citizen suits. As justification for the elimination of Ohio's air pollution nuisance provision, the Proposed Rule asserts that the Ohio EPA has never relied on this provision for maintenance or attainment and has represented to the U.S. EPA that the Ohio EPA does not "intend" to rely on this provision in the future. But enforcement proceedings by the Ohio EPA is not, and was never intended to be, the sole means of enforcing Ohio's SIP and Title V permit provisions which incorporate all or some of the SIP. Citizen suits have and will continue to be an important means of enforcing Ohio's SIP. The nuisance provision provides an important enforcement vehicle for these citizen suits, particularly because the provision primarily protects people who reside or work in close proximity to emission sources and may suffer localized but disproportionately extreme harms. Accordingly, individual Ohioans have *and currently do* rely on Ohio Admin. Code 3745-15-07 in Clean Air Act enforcement actions. Elimination of this provision would inhibit the use of an important tool used by Ohioans.

As numerous courts have recognized, Congress intended citizen suits to be an important enforcement mechanism within the broader protective scheme of the Clean Air Act. "The legislative history of the Clean Air Act Amendments reveals that the citizen suits provision reflected a deliberate choice by Congress to widen citizen access to the courts, as a supplemental and effective assurance that the Act would be implemented and enforced." *NRDC v. Train*, 510 F.2d 692, 700 (D.C. Cir. 1974). Moreover, citizen suits were viewed by Congress as a backstop to lax enforcement by state agencies. "There is … an extensive legislative history to establish that Congress intended citizen suits to both goad the responsible agencies to more vigorous enforcement of the anti-pollution standards and, if the agencies remained inert, to provide an alternate enforcement mechanism." *Baughman v. Bradford Coal Co.*, 592 F.2d 215, 218 (3d Cir. 1979) (citing Rep. No. 1196, 91st Cong., 2d Sess. 2, 35-36 (1970) and the comments of Senator Muskie and Senator Boggs in 116 Cong.Rec. (1970) at pp. 32902, 32918).

Ohio residents have repeatedly relied on Ohio Admin. Code 3745-15-07 as a means of protecting themselves from hazardous or damaging emissions. For example, an individual resident invoked Ohio Admin. Code 3745-15-07 to seek relief from numerous airborne pollutants emitted from a nearby waste treatment facility; the district court held, over the defendant's argument to the contrary, that the nuisance provision is federally enforceable. *See Fisher v. Perma-Fix of Dayton, Inc.*, No. 3:04-CV-418, 2006 WL 212076, at *5 (S.D. Ohio Jan. 27, 2006). The suit prompted intervention by the U.S. EPA, which obtained a consent decree to address violations of the National Emission Standards for Hazardous Air Pollutants for Off-Site Waste Recovery Operations. The defendant also agreed to ongoing accountability to a neighborhood environmental committee which would directly oversee any nuisance-causing conditions. *Id.* Dkt. #146, 152-1. Local governments have also relied on Ohio Admin. Code 3745-15-07 to halt harmful air pollution and enforce the Clean Air Act. *See City of Ashtabula v.*

Norfolk S. Corp., 633 F. Supp. 2d 519, 528–29 (N.D. Ohio 2009). Far from being vestigial or disused, the nuisance provision has been an important tool for individual Ohio residents to protect themselves from harmful air pollution and to enforce Ohio's implementation of the Clean Air Act.

The importance of Ohio's nuisance provision to citizen suit enforcement of the Clean Air Act is made especially clear by a pending suit alleging a public nuisance in violation of Ohio's SIP, *Sampson, et al. v. SunCoke Energy et al.*, 1:17-cv-00658-MRB (S.D. Ohio). The *Sampson* enforcement action was brought by two families who live close to a facility that produces more than 1 million tons of coke each year. *Sampson et al.*, 1:17-cv-00658, Dkt. #1 ("Complaint"), at ¶¶14-15. According to the Complaint (attached as Exhibit 4), the facility frequently releases large plumes containing myriad pollutants which cause severe upper respiratory symptoms and other discomfort to plaintiffs (and their grandchildren), coat the Plaintiffs' property in greasy deposits, and make homegrown produce inedible. *Id.* at ¶¶69, 75, 79-88. The nuisance provision allows ordinary individuals to enforce the Clean Air Act and protect themselves from hazardous pollution that has the effect of harming their health or property without the technical hurdles associated with demonstrating exceedances. This is entirely consistent with, and fulfills Congressional intent in enacting, the citizen suit provisions of the Clean Air Act.

Fundamentally, enabling individual citizens to pursue individual polluters furthers the Clean Air Act's goal of *regional* compliance with the NAAQS. "The [U.S.] EPA itself does not typically regulate individual sources of emissions. Instead, decisions regarding how to meet NAAQS are left to individual states. *Id.* § 7410(a)(1)." *Bell v. Cheswick Generating Station*, 734 F.3d 188, 190 (3d Cir. 2013). In including Ohio Admin. Code 3745-15-07 in its original SIP (and reaffirming its inclusion with only clarifying revisions in 1984 and 2014), Ohio has chosen the public nuisance suit as a means of empowering citizens to protect themselves from individual emitters, and thereby promoting attainment of the NAAQS throughout the State. The Proposed Rule arbitrarily ignores the role citizen suits play in Clean Air Act enforcement generally, and the existence of past and ongoing citizen suits relying on Ohio Admin. Code 3745-15-07, in particular.

C. The Proposed Rule would harm already vulnerable Ohioans by eliminating an important environmental justice tool.

Not only would the Proposed Rule undermine an important vehicle for Clean Air Act enforcement, it would substantively alter the scope of protections currently enjoyed by Ohio residents under the SIP. The nuisance provision plays an important role in ensuring both citizens and regulators can address serious forms of air pollution that may, for a variety of reasons, not trigger or register as a numerical exceedance of a Title V permit or NAAQS violation. Elimination of the provision will harm Ohioans by depriving those most vulnerable to air pollution of a SIP standard for protection that prioritizes human health and has the flexibility to incorporate new public health and other scientific knowledge.

The text of Ohio Admin. Code 3745-15-07 makes human health and well-being the ultimate touchstone of emissions limits: Any emissions that "endanger the health, safety, or welfare of the public" are prohibited. Whereas the NAAQS are tied to numerical values over periods of time (which can only be updated through a lengthy administrative process), Ohio Admin. Code 3745-15-07 provides assurance that emissions which significantly harm individuals, even acutely, can be halted through immediate enforcement action. The provision thus provides important flexibility and a safety net within Ohio's Clean Air Act enforcement structure as a whole.

Because the effects of emissions are not evenly distributed throughout an attainment area, the nuisance provision is an important environmental justice tool. Where Ohio has chosen to rely on ambient monitoring (rather than modeling) for NAAQS attainment designation, there remain situations where individuals in close proximity to a stationary source suffer from high concentrations of harmful pollutants that go undetected by the Ohio EPA. Even where emissions in a region do not exceed the NAAQS, communities closest to significant emitters may suffer health effects from the relatively high exposure to emissions. High-polluting facilities are disproportionately located in impoverished communities and communities of color, and people of color, working-class people, and people with household incomes below the poverty line disproportionately suffer the health effects of toxic emissions.[7] Ohio's air pollution nuisance

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[7] *See, e.g.* Ihab Mikati, Adam F. Benson, Thomas J. Luben, Jason D. Sacks, and Jennifer Richmond-Bryant, "Disparities in Distribution of Particulate Matter Emission Sources by Race and Poverty Status," *American Journal of Public Health* 108 (2018), pp. 480-485, available at https://doi.org/10.2105/AJPH.2017.304297 (study by EPA scientists finding significantly higher burdens for non-Whites and people living in poverty for fine particulate matter); Mary B Collins et al., "Linking 'toxic outliers' to environmental justice communities," *2016 Environ. Res. Lett.* 11, available at https://iopscience.iop.org/article/10.1088/1748-9326/11/1/015004 (finding a class of "hyper-polluters" that "disproportionately expose communities of color and low income populations to chemical releases"); *see also* Jean D. Brender, Juliana A. Maantay, Jayajit Chakraborty, "Residential Proximity to Environmental Hazards and Adverse Health Outcomes," *American Journal of Public Health* 101, no. S1 (December 1, 2011), pp. S37-S52, available at https://doi.org/10.2105/AJPH.2011.300183 (literature review of studies of the relationship between geographical proximity to environmental hazards and adverse health outcomes); J. Tom Boer, Manuel Pastor, Jr., James L. Sadd and Lori D. Snyder, "Is There Environmental Racism? The Demographics of Hazardous Waste in Los Angeles County," *Social Science Quarterly* Vol. 78, No. 4 (December 1997), pp. 793-810 (concluding working-class communities of color were the communities most affected by hazardous waste treatment, storage, and disposal facilities in Los Angeles County); S. Perlin, K. Sexton, & D. Wong, "An examination of race and poverty for populations living near industrial sources of air pollution," *J Expo Sci Environ Epidemiology* 9 (1999), pp. 29–48, available at https://doi.org/10.1038/sj.jea.7500024 (finding, across three different U.S. regions, that African-Americans and those living in households below the poverty level were most likely to live closer to the nearest industrial source of air pollution).

provision empowers individuals who bear the highest health burdens associated with proximity to air pollution to bring a Clean Air Act enforcement action to stop the ongoing hazard created by that pollution.

Another scenario in which the air pollution nuisance provision may be essential to protecting Ohioans from air pollution is where there has been a significant advancement in scientific research as to the health effects of a particular form of air pollution which the NAAQS or other numerical standards have yet to incorporate. Scientific understandings of both the threshold at which impacts from a given pollutant occur and the severity of such impacts are constantly and sometimes rapidly evolving.[8] The process by which NAAQS are revised and approved is often considerably slower (and states may lag even further in updating their SIPs for attainment). *See, e.g.*, 75 Fed. Reg. 35523 (describing four-year process from the formal initiation of review of sulfur dioxide primary NAAQS to the promulgation of the 2010 1-Hour Primary Sulfur Dioxide NAAQS, and litigation aimed at prompting rulemaking dating back almost 15 years); EPA-HQ-OAR-2019-0452 (findings of failure to submit SIPs required for attainment of the 2010 1-Hour Primary Sulfur Dioxide NAAQS). Where localized pollution creates a severe health hazard but federal rulemaking has not yet incorporated new knowledge of this hazard into the relevant NAAQS, Ohio Admin. Code 3745-15-07 provides a crucial gap-filling measure by which individuals can protect themselves from hazardous emissions.

Finally, the flexibility offered by Ohio Admin. Code 3745-15-07 may be important where individuals suffer qualitative effects from pollution that do not obviously correspond to quantitative emissions levels or where those individuals lack access to information about the atmospheric concentrations they are experiencing or the quantities emitted by a single source. For example, the harms suffered by the Sampson and Gannon families in the above-described case includes a persistent layer of greasy materials that coats their home resulting in respiratory symptoms such as coughing and congestion. Because the nuisance standard is closely tied to human health and well-being, it provides a basis for enforcement proceedings to protect individuals from forms of air pollution that are personally devastating but not necessarily cleanly or clearly tied to numerical concentration levels.

The Ohio EPA has expressly recognized that the nuisance provision serves this important purpose. As part of its responses to comments on the 5-year review of Ohio Admin. Code 3745-15, Ohio EPA clarified that the provision requires nuisances—conditions that cause ongoing,

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[8] For example, introduction of a new disease may exacerbate or reveal the true extent of harms caused by emissions of a particular pollutant at a concentration previously thought to be relatively benign. A recent study suggests this is the case with COVID-19; individuals with marginally higher PM2.5 exposure had a greater risk of dying from the novel disease. *See* Lisa Friedman, "New Research Links Air Pollution to Higher Coronavirus Death Rates," *NYTimes* (April 7, 2020), available at https://www.nytimes.com/2020/04/07/climate/air-pollution-coronavirus-covid.html.

significant harm to neighbors—be abated even if emissions from a stationary source are otherwise within the permitted limits: "It is important to point out … that if the emissions from a source of any substance are found to be a public nuisance, then the source must be subject to the nuisance rule even if it is complying with its permitted limits so that the nuisance can be abated." Response to Comments, Exhibit 2, at p. 8. The Proposed Rule's assertion that the Ohio EPA has not relied on this provision "for attainment or maintenance of any NAAQS," is a non-sequitur; the Ohio EPA intended that individuals could rely on the rule to protect themselves from emissions that "endanger [the public's] health, safety or welfare…or cause unreasonable injury or damage to property." Ohio Admin. Code 3745-15-07(A). The EPA cannot and should not unilaterally take away this protection, especially where Ohio EPA has not and likely could not make the requisite showings to remove the provision under the Clean Air Act, including the anti-backsliding provisions, and implementing regulations found at 40 C.F.R. Part 51, Appendix V.

III. Conclusion

If the Proposed Rule is adopted, and Ohio Admin. Code 3745-15-07 is eliminated from Ohio's SIP, the scope of prohibited emissions under Ohio's SIP will be reduced. This is not "error correction," and the EPA's attempt to make such a substantive change through the mechanism provided by 42 U.S.C. §7410(k)(6) is unlawful. Even if the proposed elimination were procedurally sound (which it is not), the elimination of Ohio Admin. Code 3745-15-07 will undermine and weaken Ohio's SIP as a means of enforcing the Clean Air Act and protecting Ohio residents. Individuals have relied and are relying on Ohio Admin. Code 3745-15-07 and will continue to need to do so, including where scientific understanding of harms outstrips the administrative process of NAAQS revisions. The individuals most likely to rely on the nuisance provision are those residing in close proximity to emission sources, *i.e.*, environmental justice communities who are disproportionately working-class, impoverished, and/or of color. Under the Proposed Rule, Ohio residents will lose an important tool for protecting themselves under the Clean Air Act. The EPA should withdraw and/or rescind the Proposed Rule.

IV. Commenters

Founded in 1892, Sierra Club is the nation's oldest and largest nonprofit grassroots environmental organization, with nearly 780,000 members nationwide, including over 22,000 in Ohio. Sierra Club's purposes are to explore, enjoy, and protect the wild places of the Earth; to practice and promote the responsible use of the Earth's ecosystems and resources; to educate and enlist humanity in the protection and restoration of the quality of the natural and human environment; and to use all lawful means to carry out these objectives. Sierra Club members are greatly concerned about air quality, and the Club has a long history of involvement in air quality related activities on both the local and national levels, including in Ohio.

Ceres is a national sustainability advocacy organization building private sector leadership to tackle the world's greatest sustainability challenges, including climate change, water scarcity,

deforestation, and pollution. Rollbacks of environmental regulations undermine the clean investments forward-thinking Ohio companies have made, jeopardizing the thousands of jobs generated by those projects and company interest in the state. Policies that protect our environment, particularly air quality, are critical for a healthy lifestyle and a vital economy.

Ohio Citizen Action organizes and mobilizes people to advocate for public interests. In person, by phone, and online, we engage people in actions that protect public health, improve environmental quality, and benefit consumers. With over 32,000 members statewide, our campaigns connect Ohioans and build a movement to protect democracy and create a sustainable future.

The Ohio Environmental Council (OEC) is a not-for-profit 501(c)(3) public interest organization whose mission is to secure healthy air, land, and water for all who call Ohio home. Comprising a network of affiliated member groups and thousands of individual members, OEC's mission is to secure healthy air, land, and water for all who call Ohio home. Founded in 1969, OEC has been a leading advocate for fresh air, clean water, and sustainable energy use in Ohio.

Natural Resources Defense Council (NRDC) is a national environmental organization with over three million members. NRDC regularly advocates before state and federal government agencies and courts for the use of effective legal, policy, and technology tools to combat a variety of environmental issues. NRDC works to ensure that everyone—not just some—benefits from a clean and healthy environment which is fundamental to what matters most to people: opportunity and a good quality of life for themselves and future generations.

AltmanNewman Co. LPA is a private, public interest law firm based in Cincinnati, Ohio focusing on individual and community enforcement of state and federal environmental laws.

For Sierra Club:

/s/ Megan Wachspress

Megan Wachspress
Associate Attorney
Sierra Club Environmental Law Program
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/s/ Mel Mackin

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Exhibit 1

U.S. Environmental Protection Agency
Region 5 - Air and Radiation Division

Correspondence

June 18, 1999

Robert F. Hodanbosi, Chief
Division of Air Pollution Control
Ohio Environmental Protection Agency
122 South Front Street
P. O. Box 1049
Columbus, Ohio 43266-1049

Dear Mr. Hodanbosi:

For the past several months, we have had discussions with you and your staff about inconsistencies with incorporating provisions of your State Implementation Plan (SIP) as applicable requirements in operating permits under your Title V Permit Program. More specifically, we are concerned that the Best Available Technology (BAT) requirements, nuisance regulation, and toxics policy which are contained in the SIP and/or SIP-approved permits, are not identified as federally enforceable terms in your Title V permits.

On March 31, 1999, John Seitz, Director of the U. S. Environmental Protection Agency's (EPA) Office of Air Quality Planning and Standards, wrote a letter to the California Air Pollution Control Officers Association in response to their questions regarding federal enforceability. In that letter, Mr. Seitz stated our view that "all provisions contained in an EPA-approved SIP and all terms and conditions in a permit issued under any SIP-approved permit program are...federally enforceable.... [A]ll such terms and conditions are also federally enforceable 'applicable requirements' that must be incorporated into the Federal side of a Title V permit." This position was reiterated in a May 20, 1999, letter to you from Mr. Seitz.

BAT is a requirement of State's Permit to Install (PTI) program, approved into the Ohio SIP. The PTI program serves, in part, to meet the general (or "minor") new source review requirements of section 110 (a)(2)(C) of the Clean Air Act (Act), which requires SIPs to include a

program for the regulation of the modification and construction of any stationary source as necessary to assure that national ambient air quality standards are achieved. Specific BAT limitations for individual sources are established in specific PTIs. Because BAT terms and conditions are created under the PTI program, which is in turn contained in the Ohio SIP, they are federally enforceable. As requirements under the SIP they also are "applicable requirements" within the meaning of the Act section 504(a) and 40 CFR 70.2 and, therefore, must reside in the Federal and State enforceable section of the Title V permit. Similarly, the terms and conditions implementing Ohio's nuisance regulation and toxics policy are included in the SIP and/or a SIP-approved permit and thus are considered federally enforceable applicable requirements for Title V purposes. They should be reflected as such in the Title V permit.

Section 505(b)(1) of the Act calls upon EPA to object to any proposed permit that is not in compliance with applicable requirements, including the requirements of a SIP. Accordingly, Title V permits which are issued with BAT, nuisance, and toxics policy terms and conditions that are misrepresented as State-only enforceable are subject to EPA objection.

It is our understanding that you intend to submit a SIP revision package requesting removal of the BAT requirements, thus making them State enforceable only. We ask that, prior to this resource intensive effort, you make all necessary assurances that this action will meet all of the planning requirements of the Act, including both specific and general requirements intended to assure the attainment and maintenance of the National Ambient Air Quality Standards and the prevention of significant deterioration of air quality. The BAT program appears to be integral to Ohio's plan for meeting many of these requirements. In addition, sections 110(l) and 193 of the Act are "antibacksliding" provisions that prohibit the approval of a SIP revision that would interfere with any applicable requirement of the Act and, in the case of nonattainment areas, require that control requirements be replaced by measures of ensuring equal or greater emissions reductions. Thus, before we could approve the removal of the BAT program from the SIP, you must demonstrate that removal of BAT would not adversely affect the various statutory requirements that BAT addresses. This will also enable our review process to be done in a timely fashion. In addition, if you choose to make the nuisance regulation and toxics policy State enforceable only, we ask that this be included as part of your SIP revision package.

Please keep in mind that the removal of these provisions from the SIP

will not affect the continuing Federal enforceability of existing PTIs. As noted above, either inclusion in the SIP or in a permit issued pursuant to a SIP-approved program renders a requirement federally enforceable. Here, the BAT requirements are contained in PTIs issued pursuant to Ohio's SIP-approved PTI program. Therefore, for sources with existing PTIs containing BAT, the BAT requirement still would have to be included on the federally enforceable side of the Title V permit. This is true also for nuisance and state toxics requirements contained in existing PTIs. We continue to have the authority to enforce BAT and the other provisions at these sources until appropriate regulatory steps are taken.

We look forward to continuing to work with you on this issue. If you have any questions or wish to discuss this issue further, please call Genevieve Damico, of my staff, at (312) 353-4761.

Sincerely yours,

/s/

Stephen Rothblatt, Chief
Air Programs Branch

AIR AND RADIATION DIVISION
77 WEST JACKSON BOULEVARD (A-18J)
CHICAGO, ILLINOIS 60604
(800) 621-8431 OR (312) 353-2212

Exhibit 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

APR 25 2012

REPLY TO THE ATTENTION OF:

Michael W. Ahern
Manager, Permit Issuance and Data Management Section
Ohio Environmental Protection Agency
Division of Air Pollution Control
50 West Town Street
Suite 700
P.O. Box 1049
Columbus, Ohio 43216

RE: Clarifications concerning federal enforceability of Ohio Administrative Code (OAC) rule 3745-15-07 nuisance permit term in Ohio OAC Chapter 3745-77 Title V permits.

Dear Mr. Ahern,

Thank you for your letter dated April 4, 2012, regarding the U.S. Environmental Protection Agency's position on the federal enforceability of Ohio's nuisance rule, OAC 3745-15-07, in Title V permits. Your letter specifically asks EPA to clarify whether, under Section 504(a) of the Clean Air Act (CAA) and 40 C.F.R. § 70.2, all provisions in State Implementation Plans (SIPs) are federally enforceable, or whether there have been any decisions or policy changes since 1999 that would lead EPA to have a different conclusion than that which was stated in the June 1999 letter from Steve Rothblatt to Bob Hodanbosi with respect to objecting to proposed Title V permits that identify Ohio's nuisance provisions as state-only enforceable.

Upon re-examining the underlying regulations, Section 504(a) of the CAA, and 40 C.F.R. § 70.2, we reaffirm our position that, because EPA has approved it into the Ohio SIP, OAC 3745-15-07 is a federally enforceable permit term for purposes of Title V permits. As noted above, you referenced in your letter a June 1999 letter from Steve Rothblatt to Bob Hodanbosi. In Enclosure A to that letter, EPA explained stated that "all provisions contained in an EPA-approved SIP and all terms and conditions in SIP-approved permits are ... federally enforceable.... [A]ll such terms and conditions are also federally enforceable 'applicable requirements' that must be incorporated into the Federal side of a Title V permit." Thus, if nuisance provisions apply to a stationary source either because it is subject to the provisions in the Ohio SIP or because a permit issued pursuant to a SIP-approved program contains the requirements, the terms must be included in the federally enforceable side of the source's Title V permit.

Your letter also asked about any decisions or policy changes since 1999 that would lead EPA to have a different conclusion. EPA has not issued any guidance that would contradict this outcome.

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We look forward to continuing to work with you on this issue. If you have any questions or wish to discuss this issue further, please feel free to contact me or Charmagne Ackerman, of my staff, at (312) 886-0448.

Sincerely,

Genevieve Damico

Genevieve Damico
Chief
Air Permits Section

Exhibit 3

Division Name

Response to Comments

Rule: Ohio Administrative Code (OAC) Chapter 3745-15, "General Provisions on Air Pollution Control"

Agency Contact for this Package

Division Contact: Paul Braun, DAPC, 614-644-3734, paul.braun@epa.ohio.gov

Ohio EPA held a 30-day comment period ending November 7, 2014 on the above mentioned rules and the associated business impact analysis document. This document summarizes the comments and questions received during the comment period.

Ohio EPA reviewed and considered all comments received during the public comment period. By law, Ohio EPA has authority to consider specific issues related to protection of the environment and public health.

In an effort to help you review this document, the questions are grouped by topic and organized in a consistent format. The name of the commenter follows the comment in parentheses.

General/Overall Concerns

Comment 1: Upon review of the proposed rule changes, we respectfully submit that they are of such an inconsequential stylistic nature that they do not warrant a change in the familiar status quo, and certainly do not warrant the administrative costs and potential disagreements attendant to revisions of fully-approved SIP provisions. We therefore think "no change" is the more appropriate, common sense outcome of the five-year review of Chapter 15. **(Robert L. Brubaker and Eric B. Gallon, Porter Wright Morris & Arthur LLP)**

Response 1: Ohio EPA is required by Ohio Revised Code (ORC) 119.032, every 5 years, to review each of the rules promulgated by the agency. OAC Chapter 3745-15 is currently undergoing its 5-year review.

While Ohio EPA concedes that some of the changes being made to the rules in this chapter are minor in nature, the 5-year review is considered the appropriate time to make these types of minor updates.

3745-15-01, "Definitions"

Comment 2: 3745-15-01 (B): The proposed omission of paragraph (B) in rule 3745-15-01 is detrimental and unnecessary to the rule of the law. Paragraph (B) defines terms such as language, "Agency", "OEPA", "EPA" and/or "board" that define entities and departments that administer the rule and/or the law.

3745-15-01(S): The proposed addition of paragraph (S) is unnecessary and irrelevant to the rule. Refer to paragraph (B) as currently stated in rule 3745-15-01 for a correct and relevant wording of the EPA, OEPA, agency, and board respectfully.

Solutions:
3745-15-01 (B): Do not omit paragraph (B).
(Scott Bushbaum, Sierra Club, Miami Group)

Response 2: The stand-alone terms "Agency" and "Board" as defined in OAC 3745-15-01(B) are no longer used to describe the Ohio EPA in Ohio's air pollution control rules. Ohio EPA is, therefore, removing the terms for clarity. Because the definition was arranged alphabetically by the word "agency", it is being moved alphabetically to paragraph (S) because the definition now starts with "O."

Comment 3: 3745-15-01 (N): The proposed omission of paragraph (N), where the language, "Effective date of these rules" should remain and refer to new effective dates. This language is important and relevant to the law and code of law.

Solutions:
3745-15-01 (N): Do not omit paragraph (N). I suggest simply changing the language to reflect new dates and the Clean Air Act, wherever applicable in the rule and throughout rule 3745.
(Scott Bushbaum, Sierra Club, Miami Group)

Response 3: The term "Effective date of these rules" is no longer used in Ohio EPA's air pollution control rules, except in instances where the term means the effective date of a newly promulgated rule where the date is unknown during the writing of the rule language. Ohio EPA, Division of Air Pollution Control has systematically gone over our rules during previous 5-year reviews and replaced this term with the actual, intended date or removed the term where it is irrelevant. This definition, which sets a specific date for this term, is no longer necessary and has been identified as potentially confusing for the regulated public. As such, Ohio EPA is removing this definition.

Comment 4: 3745-15-01 (O): The proposed change of the word, "source(s)" to word, "source" is unnecessary and quantifies the rule language incorrectly.
Solutions:
3745-15-01(O): Do not remove or change the word "source(s)". The context of the language as is currently stated in rule 3745-15-01 is correct and relevant language.
(Scott Bushbaum, Sierra Club, Miami Group)

Response 4: The Ohio Legislative Services Commission (LSC), in their "Rule Drafting Manual" (Fourth Edition, May, 2006) indicates in Section 5.8.4, P.46, that in terms of number..."The singular includes the plural and the plural includes the singular. It is generally preferable to write in the singular, unless the plural is more appropriate to the context."

The use of the parenthetic (s) is counter to LSC rule writing procedure and, therefore, Ohio EPA is converting these terms to the singular to avoid confusion and to bring Ohio EPA rule language in-line with state rule formatting convention.

Comment 5: Solutions:
3745-15-01 (BB): I suggest reviewing the changes in paragraph (BB). The proposed changes in language, "incorporated" to "referenced", and "regulation" to "rule" are questionable as to the relevance and importance of the proposed changes with regard to how the language is currently stated. The context of the proposed language needs not interfere with other language throughout rule 3745-21 or rule of law throughout rule 3745.
(Scott Bushbaum, Sierra Club, Miami Group)

Response 5: Ohio EPA is required by Section 121.72 of the Ohio Revised Code (ORC) to provide potentially affected parties with information regarding items that have been incorporated by reference within our rules. To fulfill these requirements, Ohio EPA has included information on the availability (how to obtain copies) and the date, edition, or version of the item referenced. This paragraph fulfills this requirement for the entire chapter and is consistent with procedures used by Ohio EPA and other agencies.

3745-15-05, ""De Minimis" air contaminant source exemption"

Comment 6: 3745-15-05 (F): The language proposed in rule 3745-15-05, paragraph (F) is unnecessary. No punctuation, ie: a period, appears at the end of the sentence where the word "director" ends the proposed sentence as well.

Solution:
3745-15-05 (F): Do not change paragraph (F). The context and wording of rule 3745-15-05, paragraph (F) is currently correct and relevant to the rule and the code of law.
(Scott Bushbaum, Sierra Club, Miami Group)

Response 6: The change made to this paragraph was for the removal of the gender specific pronoun to meet LSC rule formatting guidelines. The lack of a period after the word "director" is a function of Ohio's Rule Authoring Software. The period is actually preserved after the struck language.

Comment 7: One proposed set of changes - to the definition of a de minimis source in OAC 3745-15-05 - is more than stylistic, and is clearly unlawful. Ohio EPA proposes to modify "ten" and "twenty five" to the numerical decimal expressions "10.0" and "25.0." The problem is that the proposed changes would amend the statutory exemption for de minimis sources in section 3704.011 of the Ohio Revised Code. Ohio EPA is, of course, a creature of statute, and is not authorized to amend or enlarge its statutory jurisdiction. The General Assembly chose not to base the de minimis exemption on decimal fractions beyond a single whole number integer. In the hypothetical circumstance of an air contaminant source with potential PM emissions of 10.4 pounds per day, that

amount would not be more than ten pounds when rounded to the nearest whole number integer. The legislation does not authorize Ohio EPA to consider fractions to the right of the decimal point in applying the ten pounds per day and twenty five tons per year de minimis criteria **(Robert L. Brubaker and Eric B. Gallon, Porter Wright Morris & Arthur LLP)**

Response 7: Ohio EPA considers a de-minimus source to be a source that emitted 10.0 and 25.0 pounds of contaminants per day or less and the draft amendment was made to clarify this interpretation. The commenter does point out, however, that the language in the rule appears to be directly taken from Ohio Revised Code (ORC) 3704.011 which includes whole number integers (ten instead of 10.0) and Ohio EPA agrees with this observation. In the interest of having the language in this rule match the language in the Revised Code, Ohio EPA will revert the draft changes back to the original whole number integers.

3745-15-06, "Malfunction of equipment; scheduled maintenance; reporting"

Comment 8: 3745-15-06 (A) (3): The proposed changes in punctuation and the omission of language, "and" in rule number 3745-15-06, paragraph (A), number (3) is unnecessarily removing quantifying and important enforcement of the rule and the code of law.

Solution:
3745-15-06 (A) (3): Do not change any punctuation or language in rule 3745-15-06. The context and enforcement of the rule and rule of law is better exemplified by the current language and punctuation. **(Scott Bushbaum, Sierra Club, Miami Group)**

Response 8: The use of the word "and" in this instance is unnecessary. Paragraph (A)(3) indicates that the report "...shall include the following:". This implies that all of the listed items must be included, therefore, "and" is not necessary and has been deleted along with the format change.

This change also brings this rule, stylistically, in-line with Ohio EPA and LSC rule formatting guidelines.

Comment 9: The proposed stylistic changes to the malfunction rule, OAC 3745-15-06, are of particular concern. The rule has been in place for decades without problems of style the Agency proposes to fix. More importantly, U.S. EPA policies with respect to malfunctions are in a state of flux at the present time.

Ohio EPA should not expose this rule to the SIP revision approval process before U.S. EPA's actions and policies with respect to currently-approved SIP malfunction provisions, like Ohio's, are more clear and settled. **(Robert L. Brubaker and Eric B. Gallon, Porter Wright Morris & Arthur LLP)**

Response 9: As noted in Response 1, the 5-year review is the time to make minor, stylistic changes such as the ones in the draft rule. The minor rule changes are being made to bring the rule in-line with state and agency rule formatting conventions. This change does not alter the content, nor intent of the rule. Ohio EPA will evaluate the context of the changes to the final rules of this chapter and determine the need, on a rule-by-rule basis, for requesting incorporation of the changes into Ohio's SIP. Ohio EPA will take your comment into consideration when deciding whether to submit the changes in this particular rule, the malfunction rule, to USEPA as a SIP revision.

3745-15-07, "Air pollution nuisances prohibited"

Comment 10: Solution: 3745-15-07 (A)(B): I suggest analyzing the criteria for exempting certain air pollution nuisances from the proposed language changes in rule 3745-15-07. If it is determined that these air pollution nuisances are not endangering the health, safety, property or welfare of the public, then do not change the language of the rule. I suggest then that when the rule is up for Early Stakeholder Outreach and JCARR review in five years, then suggest/propose changes in the language of rule 3745-15-07, paragraphs (A) and (B) respectfully.
(Scott Bushbaum, Sierra Club, Miami Group)

Response 10: OAC Chapter 3745-15 is currently undergoing its 5-year review. The rule was sent out for a 30-day early stakeholder comment period ending November 5, 2013. No comments or suggestions were received on this rule at that time. Ohio EPA then went ahead and made changes intended to clarify the rule without changing the intent of the rule.

Comment 11: The proposed stylistic changes to the nuisance rule, OAC 3745-15-07, do not change its meaning, and do not warrant the administrative costs of minor stylistic revision. The problem with the nuisance rule is not its punctuation, but rather the misperception of its status as federal rather than State-only law. The nuisance rule was clearly never designed or intended to be an integral part of the Ohio SIP NAAQS attainment strategy, nor was it ever publicly noticed or technically supported as such. The nuisance rule became particularly controversial subsequent to the introduction of the Title V permit program in the mid- 1990s, because it does not fit the definition of a Title V "applicable requirement." It is not required by the Clean Air Act and does not "implement relevant requirements of the Clean Air Act." See OAC 3745-77- 01(H)(1). It is therefore not a Title V "applicable requirement," but rather a State-only requirement. Nevertheless, Ohio EPA has placed the nuisance rule on the federally-enforceable side of Title V permits, which has led to a number of ERAC appeals (still pending) challenging the mischaracterization of the Ohio nuisance rule as a Title V "applicable requirement." Region 5 has appropriately approved the removal of the similar nuisance rule from Michigan's SIP, and the same should happen for Ohio. Region 5 approved Michigan's request to remove Rule 901, the Michigan nuisance rule, from Michigan's SIP because U.S. EPA correctly concluded that "the rule does not have a reasonable connection to the national ambient air quality standards (NAAQS) and related air quality goals of the Clean Air Act." See 63 Fed. Reg. 27492 (May 19, 1998). Ohio should likewise remove the nuisance rule from its SIP as soon as possible. **(Robert L. Brubaker and Eric B. Gallon, Porter Wright Morris & Arthur LLP)**

Response 11: Thank you for your comment. This comment is outside the purview of this rulemaking, however Ohio EPA will take this comment into consideration when determining if Ohio will request U.S. EPA to reconsider Ohio's nuisance rule as a SIP provision.

Comment 12: If any revision is to be proposed to the Ohio nuisance rule, it should be to add an explicit exemption for any source/pollutant combination subject to, and in substantial compliance with, an Ohio EPA or U.S. EPA rule, order, or permit requirement specifying allowable emissions, control requirements, or work practices for that source/pollutant combination. Emissions that environmental protection agencies have specifically addressed with technically exacting emission limits or control requirements should not be exposed to inconsistent overlapping public nuisance liability (that is inherently more subjective and nebulous).. **(Robert L. Brubaker and Eric B. Gallon, Porter Wright Morris & Arthur LLP)**

Response 12: Ohio EPA is now not proposing any changes to the nuisance rule. It is important to point out, however, that if the emissions from a source of any substance are found to be a public nuisance, then the source must be subject to the nuisance rule even if it is complying with its permitted limits so that the nuisance can be abated.

3745-15-08, "Circumvention"

Comment 13: 3745-15-08: The proposed changes in rule number 3745-15-08 are relevant to the enforcement and to the intent of the rule and the code of law.
(Scott Bushbaum, Sierra Club, Miami Group)

Response 13: Ohio EPA thanks you for your comment.

End of Response to Comments

Exhibit 4

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF OHIO
WESTERN DIVISION

James Sampson 2737C Back Road Franklin Furnace, Ohio 45629 Roberta Sampson 2737C Back Road Franklin Furnace, Ohio 45629 Brian Gannon 2737A Back Road Franklin Furnace, Ohio 45629 Mary Gannon 2737A Back Road Franklin Furnace, Ohio 45629 **PLAINTIFFS** **v.** Haverhill Coke Company, LLC 2446 Gallia Pike Franklin Furnace, OH 45629 SunCoke Energy, Inc. 1011 Warrenville Road, Suite 600 Lisle, IL 60532 **DEFENDANTS**	**CASE NO. 1:17-cv-658** **Judge** _____ **COMPLAINT AND DEMAND FOR A JURY TRIAL**

INTRODUCTION

1. James Sampson, Roberta Sampson, Brian Gannon, and Mary Gannon (collectively "Plaintiffs") bring this civil action because sludge-like deposits, strong

odors, particulates (including PM_{10} and, acutely hazardous, $PM_{2.5}$), lead, mercury, arsenic, cadmium, beryllium, chromium, creosote, coke oven emissions, coal tar pitch, coal tar pitch volatiles, coke wastes, coal wastes, dust, polycyclic aromatic hydrocarbons (e.g., benzo(a) pyrene and chrysene) ("PAHs"), sulfur dioxide, oxides of nitrogen, dioxins, volatile organic compounds ("VOCs"), acid gases (such as sulfuric acid, hydrochloric acid, and oxides of sulfur), volatiles, carbon monoxide, benzene, flue gas, chemical clouds and haze, other solid and hazardous wastes, other hazardous substances and pollutants, and mixtures containing such substances (hereinafter collectively referred to as "Noxious and Hazardous Substances") have been and continue to be released from the Haverhill Coke Company plant into the environment at and about the plant.

2. The Haverhill Coke Company plant is located in Scioto County at 2446 Gallia Pike in Franklin Furnace, Ohio 45629 ("Facility"). The Noxious and Hazardous Substances, including visible deposits ("Visible Deposits"), have migrated and continue to migrate onto the property and into the homes of the Plaintiffs and other area residents, all in violation of the Federal Clean Air Act, 42 U.S.C. § 7401 *et seq.* ("CAA"), the Ohio State Implementation Plan ("Ohio SIP"), and/or the Ohio Revised Code, the Ohio Administrative Code, and the Facility's existing permits.

3. Said releases have endangered and continue to endanger the health, comfort, safety, and welfare of the public, including the Plaintiffs, and have caused and

continue to cause unreasonable injury and damage to property and the environment and constitute a continuing nuisance and trespass. The Facility's unauthorized releases, violations of law and regulation, and unauthorized invasion of the Plaintiffs' property will continue unless abated and restrained.

4. Plaintiffs seek injunctive relief to compel Defendants to, inter alia: fund and/or undertake the comprehensive investigation and remediation of the contamination that has resulted and will continue to result from the releases of Noxious and Hazardous Substances. Plaintiffs also seek restitution of all costs expended; a comprehensive medical monitoring program; civil penalties; damages, including punitive damages; and injunctive relief for nuisance, trespass, negligence, ultra-hazardous activities, negligent infliction of emotional distress, and intentional infliction of emotional distress.

5. Defendants Haverhill Coke Company, LLC ("Haverhill") and SunCoke Energy, Inc. ("SunCoke") own and operate the Facility. The Facility is a plant that operates 200 non-recovery coke ovens, which are used to produce nearly 1 million tons of coke annually. As part of its operations, the Facility has coal and coke storage piles; coal handling, processing, and transfer operations; coke and breeze handling and processing operations; two quench towers; 200 coke ovens with heat recovery steam generators; and a cogeneration plant that release Noxious and Hazardous Substances into the environment.

6. Defendants' repeated and multiple violations of a wide spectrum of permit requirements demonstrate Defendants' past and continuing disregard for the law, including the CAA, and conscious disregard for the impacts of the Facility's operations on the community, and disregard for the Facility's impacts on the quality of the environment in the region. In fact, releases of Noxious and Hazardous Substances, including Visible Deposits, continue, and the effects of said releases have not been remediated despite Defendants' knowledge of said releases and knowledge of the adverse impacts and threats of adverse impacts on health and the environment that are caused by those releases.

JURISDICTION AND VENUE

7. This Court has subject matter jurisdiction pursuant to 28 U.S.C. § 1331 because this is a civil action arising under the laws of the United States and 42 U.S.C. § 7604(a) as a result of the claims made under the CAA, 42 U.S.C. § 7401, *et seq.*, and the federally-approved Ohio SIP. This Court also has subject matter jurisdiction pursuant to 28 U.S.C. § 1355 (action for penalty) and 28 U.S.C. § 2201 (declaratory judgment).

8. This Court has supplemental jurisdiction, under 28 U.S.C. § 1367, over the claims that arise under the laws of the State of Ohio.

9. This Court has personal jurisdiction over all the Defendants because each transacts business in Ohio, have contracted to supply services or goods in Ohio, have caused tortious injury in Ohio to Plaintiffs by acts and omissions that occurred within

and outside Ohio, and have an interest in, are using, or are in possession of real property, including the Facility, located in Ohio. Further, Defendant Haverhill is registered in Ohio.

10. Venue is proper in this district pursuant to 28 U.S.C. § 1391 and 42 U.S.C. § 7604(c) in that the violations alleged herein have occurred in this District and the Facility that is the subject of this Complaint is located in this District.

NOTICE AND NO DILIGENT PROSECUTION

11. More than sixty days before the filing of this action under 42 U.S.C. § 7604, the Plaintiffs gave written notice of the violations and their intent to sue by letter of July 19, 2017 to the Defendants and all other persons required to be notified. Each Defendant, Defendants' statutory agents, and governmental officials received that citizen suit notice letter. Defendants' counsel has stated that Defendants will accept service of the Complaint via email on Defendants' counsel.

12. Neither the United States Environmental Protection Agency ("US EPA") nor a State has commenced and is diligently prosecuting a civil action in a court of the United States or a State to require compliance with the emission standards or limitations described herein.

13. Certain of the Facility's prior air violations, none of which are alleged herein, were the subject of a federal complaint filed by the United States and Ohio simultaneously with a proposed consent decree in 2013, later resulting in a November

2014 consent decree (CD). That CD does not enforce, resolve, or otherwise remedy the violations discussed in this Complaint. For example, the CD does not enforce, resolve, or remedy the Defendants' violations of Ohio's air nuisance provision, Ohio Adm. Code § 3745-15-07, or the corresponding permit term prohibiting such air nuisances.

THE PARTIES

14. Plaintiff James Sampson and Plaintiff Roberta Sampson are residents of Scioto County, Ohio, who own property and reside at 2737C Back Road, Franklin Furnace, Ohio 45629. A grandson lives with the Sampsons. The Sampsons' property also contains a rental home that is leased to the Sampsons' son and his family, including five other grandchildren. The Sampsons live and own property within the zone of influence of the Facility's releases and threatened releases of the Noxious and Hazardous Substances into the environment. The Sampsons have farm animals and a small garden, tended to by their grandson, within the zone of influence of the Facility. The Sampsons have been and will continue to be exposed to injury and threatened further injury due to the continuing emissions and releases of Noxious and Hazardous Substances from the Facility in violation of federal and Ohio law.

15. Plaintiff Brian Gannon and Plaintiff Mary Gannon are residents of Scioto County, Ohio, who own property and reside at 2737A Back Road, Franklin Furnace, Ohio 45629. The Gannons also own the adjoining parcels at 2737E Back Road and 0 Richard Road. The Gannons live and own property within the zone of influence of the

Facility's releases and threatened releases of Noxious and Hazardous Substances into the environment. The Gannons also have goats on their property and are concerned that the water and hay that their goats consume is directly impacted by Noxious and Hazardous Substances. The Gannons have been and will continue to be exposed to injury and threatened further injury due to the continuing emissions and releases of Noxious and Hazardous Substances from the Facility in violation of federal and Ohio law.

16. Plaintiffs have protectable environmental, aesthetic, and conservation interests in their surrounding environment. This includes an interest in protecting their health and welfare, as well as their property.

17. Similarly, Plaintiffs have an interest in the quality of the air they breathe and are continually threatened by the release of Noxious and Hazardous Substances from the Facility.

18. Further, Plaintiffs have an economic interest in protecting their real and personal property and animals and have suffered and will continue to suffer damage to their real and personal property due to the continuing emissions from the Facility in violation of federal and Ohio law.

19. Because Defendants have caused and continue to cause frequent emissions and releases of Noxious and Hazardous Substances from the Facility,

including Visible Deposits, Plaintiffs have a recognizable interest in enforcing federal and state law, including inter alia the CAA and Ohio SIP.

20. Defendant Haverhill is a Delaware limited liability corporation that has an Ohio address of 2446 Gallia Pike, Franklin Furnace, Ohio 45629. It identifies its principal business address as 1011 Warrenville Road, Suite 600, Lisle, IL 60532. Haverhill is an owner and operator of the Facility and has caused, participated in, controlled, and/or directed the violations of law described in this Complaint. Haverhill knew or should have known about these violations and had the authority to prevent or stop these violations, but failed to do so. Haverhill is a subsidiary of Defendant SunCoke.

21. Defendant SunCoke is a Delaware corporation. It identifies its principal business address as 1011 Warrenville Road, Suite 600, Lisle, IL 60532. SunCoke is an owner and operator of the Facility and the parent company of Defendant Haverhill.

22. Defendant SunCoke exercises pervasive control over the Facility and its subsidiaries, including Haverhill. SunCoke has caused, participated in, controlled, and/or directed the violations of law described in this Complaint. SunCoke knew or should have known about these violations and had the authority to prevent or stop these violations, but failed to do so. For example, during relevant times, SunCoke oversaw environmental issues (including noncompliance with air laws) and reporting at the Facility and communicated with regulators about environmental violations at the

Facility. It is therefore directly liable for the environmental violations occurring at the Facility.

23. Further, Defendant SunCoke has disregarded the corporate form of its subsidiaries, including Haverhill, so that those companies have no mind or will of their own. SunCoke has used its control over the Facility and the subsidiaries to perpetrate and otherwise not prevent or abate the environmental violations and torts described in this Complaint. Therefore, the corporate form should be disregarded and liability also assessed against SunCoke for the environmental violations and torts and injuries and damages described herein.

STATUTORY AND REGULATORY BACKGROUND

The Clean Air Act (CAA)

24. The CAA is designed to protect and enhance the quality of the nation's air resources so as to protect and promote the public health and welfare and the productive capacity of the nation's population. 42 U.S.C. § 7401(b)(1).

25. Pursuant to the CAA, the US EPA promulgated national ambient air quality standards ("NAAQS") necessary to protect the public health and welfare. 42 U.S.C. § 7409. The pollutants for which NAAQS have been set include ozone, particulate matter, carbon monoxide, sulfur dioxide, nitrogen dioxide, and lead.

26. The CAA's regulation of NAAQS pollution demonstrates Congressional recognition of the importance of regulating such pollutants. Such regulation is needed

to protect public health, including the health of sensitive populations, such as asthmatics, children and the elderly, as well as to protect the public welfare.

27. The CAA requires each state to adopt and submit to US EPA for approval a state implementation plan ("SIP") that provides for the implementation, maintenance, and enforcement of the NAAQS. 42 U.S.C § 7410(a)(1). The State of Ohio submitted to the Ohio SIP for achieving and maintaining said air quality standards. The Ohio SIP was first approved by the US EPA on May 31, 1972 and was incorporated by reference into the Code of Federal Regulations at 40 C.F.R. § 52.1870, thereby becoming enforceable as a matter of federal law.

28. All of the provisions of the Ohio Administrative Code the Plaintiffs are enforcing in this action are in the Ohio SIP.

29. The Ohio SIP is required (under 42 U.S.C. § 7471 of the CAA) to contain emission limitations and such other measures as may be necessary to prevent significant deterioration of air quality.

30. In order to prevent the significant deterioration of air quality as required under Section 7471 of the CAA, federal regulations, including inter alia, 40 C.F.R. § 52.21 ("PSD regulations") preclude the construction of new major sources or major modifications without a "prevention of significant deterioration" permit ("PSD permit").

31. The Facility is such a major source and/or has constructed such major modifications.

32. PSD regulations for Ohio are set forth in Ohio Administrative Code ("O.A.C.") §§ 3745-31-01 through 3745-31-20. Any Ohio regulations approved as part of the Ohio SIP constitute federal law enforceable under the CAA. Pursuant to 40 C.F.R. § 52.1884, the federal PSD regulations set forth in 40 C.F.R. § 52.21 are also incorporated and made a part of the Ohio SIP. Thus, the Facility is subject to the applicable provisions of the PSD regulations as promulgated by the US EPA.

33. The Facility is required—and has failed—to comply with the terms of its PSD permits, including its PSD permit effective November 10, 2008, and subsequent modifications that include, inter alia, the December 26, 2008; February 19, 2015; December 8, 2015; and November 21, 2016 modifications (collectively, the "PSD Permit").

34. The Facility operates 200 non-recovery coke ovens designated as Batteries A, B, C, and D. Batteries A and B began operation in 2005 and are identified by the Facility's PSD Permit as part of emission unit P901. Batteries C and D began operation in 2008 and are identified by the Facility's PSD Permit as part of emissions unit P902.

35. P901 has five bypass vent stacks (VS1–VS5) and P902 has five bypass vent stacks (VS6–VS10) that are subject to emission limits as set forth in the Facility's PSD

Permit. When these vent stacks are open, Noxious and Hazardous Substances are emitted.

36. In addition to the 200 coke ovens, and as part of its coke making operations, the Facility has coal and coke storage piles (F002); coal handling, processing, and transfer operations (F003); coke and breeze handling and processing operations (F004); and two quench towers (P001 and P002).

37. The Facility's PSD Permit contains emissions limits and operational standards for emission units, including, inter alia, P901, P902, F002, F003, F004, P001, and P002.

38. The citizen suit provision of the CAA authorizes "any person" to commence a civil action against "any person" who is alleged to have violated or to be in violation of any "emission standard or limitation under [the CAA]," including any requirement in any approved SIP, any permit term or condition in effect under the CAA or an approved SIP, or a condition or requirement of a PSD permit. 42 U.S.C. § 7604.

39. The CAA defines "person" as "an individual, corporation, partnership, association…." 42 U.S.C. § 7602(e).

40. Each Plaintiff is a "person" within the meaning of 42 U.S.C. § 7602(e) and 42 U.S.C. § 7604(a).

41. Each Defendant is a "person" within the meaning of 42 U.S.C. § 7602(e) and 42 U.S.C. § 7604(a).

National Emission Standards for Hazardous Air Pollutants (NESHAPs)

42. Congress established a list of 188 hazardous air pollutants ("HAPs") believed to cause adverse health or environmental effects in the CAA. 42 U.S.C. § 7412(b). US EPA periodically reviews the list of hazardous air pollutants and, where appropriate, revises the list by rule. 42 U.S.C. § 7412(b)(2).

43. CAA Section 7412 requires US EPA to publish a list of all categories and subcategories of major sources and certain area sources of the HAPs and promulgate regulations establishing emissions standards for each. 42 U.S.C. § 7412. These emission standards are called the National Emission Standards for Hazardous Air Pollutants ("NESHAPs") for Source Categories (40 C.F.R. Part 63). Coke oven batteries are regulated under the NESHAPs.

44. Under CAA Section 7412, US EPA promulgated the National Emission Standards for Coke Oven Batteries (40 CFR Part 63, Subpart L) and the National Emission Standards for Hazardous Air Pollutants for Coke Ovens: Pushing, Quenching, and Battery Stacks (40 C.F.R. Part 63, Subpart CCCCC).

45. The Facility is subject to and must comply with the NESHAPs in 40 C.F.R. Part 63, including inter alia, Subparts L and CCCCC.

46. The citizen suit provision of the CAA authorizes "any person" to commence a civil action against "any person" who is alleged to have violated or to be in violation of any requirement under section 7412 of the CAA. 42 U.S.C. § 7604(f)(3).

DEFENDANTS' RELEASES

47. As a result of the Facility's operations, large quantities of Noxious and Hazardous Substances, including NAAQS pollutants and HAPs, are released and emitted. The harmful effects associated with these and other Noxious and Hazardous Substances released from the Facility are well known.

48. For example, NO_x has numerous adverse effects on health, welfare, and the environment. NO_x reacts with other pollutants and sunlight to form ground-level ozone, which scientists have long recognized as being harmful to human health and the environment. Ozone can cause decreases in lung function (especially among children who are active outdoors) and respiratory problems leading to increased hospital admissions and emergency room visits. Ozone can cause inflammation and permanent damage to the human lung. In addition, ozone causes damage to vegetation.

49. Nitrogen dioxide ("NO_2"), one type of NO_x, is a noxious and hazardous pollutant that can cause people to have difficulty breathing by constricting lower respiratory passages. It may also weaken a person's immune system, causing increased susceptibility to pulmonary and other forms of infections. While children and asthmatics are the primary sensitive populations, individuals suffering from bronchitis, emphysema, and other chronic pulmonary diseases have a heightened sensitivity to NO_2 exposure.

50. Emissions of sulfur dioxide (SO_2) and NO_x form fine nitrate and sulfate particles. Inhalation of these fine particles is associated with respiratory distress, cardiovascular disease, and premature mortality.

51. Particulate matter is the term for solid or liquid particles found in the air. Particulate matter with a diameter of 10 micrometers or less is referred to as "PM_{10}." Particulate matter with a diameter of 2.5 micrometers or less is referred to as "$PM_{2.5}$." Breathing air containing PM_{10} or $PM_{2.5}$ increases the incidence of premature death, cancer, respiratory disease, and lung damage. $PM_{2.5}$ poses an especially great risk to health because the particles can become lodged deep into the lungs and may enter the bloodstream. $PM_{2.5}$ can cause or aggravate respiratory diseases, such as asthma and bronchitis. In fact, there is no safe level of exposure to $PM_{2.5}$. The elderly, children, and people with chronic lung disease, influenza, or asthma, tend to be especially sensitive to the effects of $PM_{2.5}$ and PM_{10}.

52. Emissions of carbon monoxide (CO) can cause harmful health effects by reducing oxygen delivery to the body's organs (including the heart and brain) and tissues. The adverse health effects from lower levels of CO are most serious for those who suffer from cardiovascular diseases such as clogged arteries, angina, or congestive heart failure.

53. Coke oven emissions, including benzene, released from the Facility are known Class A human carcinogens or are extremely toxic, even at low levels. Exposure

to coke oven emissions through inhalation may cause an increase in cancer of the lung, trachea, bronchus, kidney, prostate and other sites of the human body.

54. Benzene, a component of coke oven emissions, is a known human carcinogen for all routes of exposure based upon convincing human evidence, as well as supporting evidence from animal studies. Benzene also has adverse effects on the respiratory system, blood, and central nervous system, and causes leukemia by having an effect on the bone marrow. Exposure to benzene can cause dizziness, lightheadedness, headaches, vomiting, and irritation of the skin, nose, throat, and eyes; and increases the risk of leukemia, bone marrow damage, chromosome damage, increased white blood cell count, damage to the human reproductive system, adverse neurological effects and other adverse health effects.

55. Mercury is a neurotoxin that disrupts the nervous system, damages brain functions, and causes DNA and chromosomal damage, allergic reactions (resulting in skin rashes, tiredness, and headaches), and negative reproductive effects, such as birth defects and miscarriages. It is persistent, bioaccumulative, and adversely impacts biota. Additionally, mercury increases the risk of nervous system damage and birth defects in humans consuming fish that have accumulated mercury.

56. Dioxins are persistent, bioaccumulative, and have been characterized by EPA as likely human carcinogens. Adverse non-cancer health effects from dioxins have been observed both in animals and in humans, including changes in hormone systems,

alterations in fetal development, reduced reproductive capacity, and immunosuppression.

57. Certain types of PAHs are known human carcinogens and carcinogenic in experimental animals. For example, benzo(a) pyrene and chrysene are probable human carcinogens. PAHs are persistent in the environment and arise from the incomplete combustion of organic material. They are potent inducers of hepatic enzymes and interact with DNA to induce neoplasms.

58. Breathing vapors with creosotes, coal tar, coal tar pitch, or coal tar pitch volatiles can cause irritation of the respiratory tract. Long-term exposure to even lower levels of coal tar creosote, coal tar, coal tar pitch, or coal tar pitch volatiles by skin or air contact can cause skin damage such as blistering or peeling. The International Agency for Research on Cancer (IARC) has determined that coal tar creosote is probably carcinogenic to humans. The US EPA has also determined that coal tar creosote is a probable human carcinogen. Long-term exposure to low levels of coal tar creosote has been found to cause skin cancer and cancer of the scrotum.

59. Arsenic is a known human carcinogen through the inhalation route of exposure and has been found to increase the risk of lung, liver, kidney, bladder, and skin cancer.

60. Chromium is a known human carcinogen through the inhalation route of exposure and has been found to increase the risk of lung cancer.

61. Lead can harm nearly every organ and system in the human body. Children are the most susceptible.

62. Hydrochloric acid and sulfuric acid are corrosive and can cause difficulty breathing and nasal and respiratory irritation when inhaled.

63. Volatile organic compounds released by the Facility, such as hexane and toluene, are toxic to the respiratory and neurologic systems.

64. In addition, many of these air contaminants, substances, and combinations of substances released from the Facility are known to damage property.

65. Paragraphs 47 through 64 of this Complaint provide a non-exhaustive list of the adverse health and environmental effects that Noxious and Hazardous Substances being released from the Facility can have and are having on human health, welfare, and the environment, including flora and fauna.

DEFENDANTS' UNLAWFUL CONDUCT AND THE CONSEQUENCES OF SUCH CONDUCT

66. The Facility's operations, including but not limited to: coal and coke storage piles; coal handling, processing, and transfer operations; coke and breeze handling, processing, and transfer operations; operation of 200 coke ovens; and quenching operations, cause or allow Noxious and Hazardous Substances to be released into the open air and deposited onto neighboring properties, including Plaintiffs' properties.

67. Defendants have knowingly, intentionally, wantonly, recklessly, and/or negligently caused or allowed Noxious and Hazardous Substances to be released from the Facility, directly resulting in Plaintiffs' exposure to and injury to their properties. In particular, Defendants have caused or allowed Noxious and Hazardous Substances to be released from the Facility in such a manner or in such amounts as to injure or endanger the health, comfort, safety or welfare of the public or cause unreasonable injury or damage to property.

68. Exposure to the Noxious and Hazardous Substances released from the Facility, including the Visible Deposits, has caused, and continues to cause, Plaintiffs and other area residents to experience coughing, gagging, nausea or vomiting, heartburn, burning or irritated eyes, sinus drainage and congestion, shortness of breath, vertigo, headaches, including migraine-like headaches, scratchy throats, phlegm, and an unpleasant, foreign taste in the mouth or back of the throat.

69. The Facility frequently and often without warning emits and releases visible grey, brown, black, yellowish, or blueish plumes, clouds, or hazes at and/or around the Facility, including the zone where Plaintiffs and their properties are located. In addition, the Facility frequently and often without warning emits odors that include burnt-rubber odors, sulfur odors, a rotten egg odor, chemical odor, coal odor, tar odor, and coke oven odors. These plumes, clouds, hazes, and odors contain Noxious and

Hazardous Substances and have repeatedly touched the ground at one or more of Plaintiffs' properties and other properties in the area.

70. In fact, in the operation of the Facility, Defendants have allowed and continue to allow the release of plumes, clouds, and haze containing Noxious and Hazardous Substances, including the Visible Deposits, from the Facility. Such releases contain concentrations of $PM_{2.5}$ at levels that present a threat to health, comfort, and welfare.

71. Defendants have frequently and often without warning unlawfully, knowingly, intentionally, wantonly, recklessly, and/or negligently prematurely removed coke from ovens before burning off all the volatiles, resulting in "green pushes" or "green ovens." Pushing a green oven can result in emissions with up to 1,000 times the level of volatiles, coke oven emissions constituents, and other air toxins than a non-green push.

72. In the Plaintiffs' experience, green oven pushes have distinctive black or yellowish clouds, particulate and gaseous emissions, and odors that escape from the Facility's ovens and quenching operations. Odors from green pushes are noticeably more strong and pungent and exposure symptoms from such releases are much more severe.

73. Following the release of Noxious and Hazardous Substances from the Facility, Visible Deposits invade and accumulate on the neighboring properties,

including Plaintiffs' properties. The Visible Deposits accumulate on homes, animals, trees, crops, porches, cars, outdoor furniture, decks, lawns, barns, and swimming pools in close proximity to the Facility, including Plaintiffs' properties. The release of Noxious and Hazardous Substances has frequently occurred and continues to occur frequently.

74. The Noxious and Hazardous Substances, including the Visible Deposits, have caused and continue to cause unreasonable injury and substantial damage to the Plaintiffs' property, have interfered and continue to interfere with the use and enjoyment of their property, and have endangered or injured the health, comfort, safety or welfare of the public, including Plaintiffs, and continue to do so.

75. Exposure to the Facility's releases leads the Sampsons to suffer coughing, gagging, nausea or vomiting, burning or irritated eyes, sinus drainage and congestion, shortness of breath, headaches, including migraine-like headaches, scratchy throats, phlegm, and an unpleasant, foreign taste in the mouth or back of the throat. The Sampsons have restricted outdoor activities, no longer use their enclosed porch, and refrain (as much as possible) from opening their windows. Despite these measures, particularly strong odors, clouds, and substances from the Facility still invade their home.

76. The Plaintiffs are concerned and apprehensive about risks to their and their family members' health from their past and ongoing exposure to Facility releases. The Sampsons and Gannons are also concerned and apprehensive about their own

health conditions deteriorating, threatened impairments to their immune systems, and developing cancer or other serious diseases or illnesses.

77. The Sampson Plaintiffs are particularly concerned and apprehensive about risks of harm to their children and grandchildren from exposure to Noxious and Hazardous Substances from the Facility, including the Visible Deposits.

78. In addition, the Sampsons are concerned and apprehensive that the health condition of the grandson who lives with them has deteriorated and will continue to deteriorate due to his exposure to Noxious and Hazardous Substances from the Facility, including the Visible Deposits.

79. Because the Visible Deposits frequently accumulate on their property, the Sampsons are forced to spend a significant amount of time each week (and sometimes daily) cleaning and removing Visible Deposits from their porches, patios, window sills, door tracks, siding, and other outdoor areas to make the areas partially usable for their intended purposes. For example, outdoor furniture must be wiped off each time Mr. or Mrs. Sampson, a family member, or a guest wishes to sit on it.

80. Due to the nature of the Visible Deposits, the Sampsons have expended increased effort, resources, and time to clean the property. Further, the Visible Deposits have damaged the Sampsons' property. For example, a normal garden hose with normal water pressure is no longer sufficient to clean the deck or the siding on the Sampsons' home; the black material can only be washed with a pressure washer and

must also be hand-scrubbed. The Sampsons are unable to remove the Visible Deposits from their gutters.

81. The Visible Deposits have invaded and damaged the inside of the Sampsons' home and they refrain (as much as possible) from opening their windows and doors to reduce the accumulation of Visible Deposits in their homes. The Sampsons struggle to keep the inside of their home clean and must change HVAC filters much more often.

82. In addition, because the Visible Deposits have formed and continue to form a thick build-up on the Sampsons' pool floor and pool cover, opening the pool each spring requires tremendous effort—it takes nearly two weeks to get the pool in a somewhat usable condition and the concrete must be re-stained each year.

83. The Sampsons also no longer consume the produce their grandson grows on the property.

84. Exposure to the Facility's releases leads the Gannons to suffer coughing, gagging, nausea or vomiting, heartburn, burning or irritated eyes, sinus drainage and congestion, shortness of breath, vertigo, headaches, including migraine-like headaches, scratchy throats, phlegm, and an unpleasant, foreign taste in the mouth or back of the throat. Mrs. Gannon often must wear a mask to tolerate being outside, the Gannons have restricted outdoor activities, no longer use and enjoy their enclosed porch, and Mrs. Gannon no longer maintains her flower beds. In addition, the Gannons refrain (as

much as possible) from opening their windows, but particularly strong odors still invade their home and have even woken them up in the middle of the night. The Gannon Plaintiffs are also particularly concerned and apprehensive about the risks of harm to their children and grandchildren from exposure to Noxious and Hazardous Substances from the Facility, including the Visible Deposits. In fact, the Gannons no longer allow their children or grandchildren to visit their property for extended visits.

85. Because the Visible Deposits frequently accumulate on their property, the Gannons are forced to spend a significant amount of time each week (and sometimes daily) cleaning and removing Visible Deposits from their porches, railings, window sills, door tracks, siding, and other outdoor areas to make the areas partially usable for their intended purposes. The frequent accumulation caused Mrs. Gannon to stop hanging laundry outside. Because the Visible Deposits accumulate so quickly after cleaning, Mrs. Gannon has recently given up attempting to keep the exterior of the house and the enclosed porch as clean as she once did. The Visible Deposits have damaged the Gannons' property and the structures on the property.

86. The Gannons have been forced to expend increased effort, resources, and time to clean the property. The Visible Deposits that accumulate on the Gannons' vehicles adhere to the cars and cannot be scrubbed off. The Visible Deposits have damaged the paint on at least one car.

87. The Visible Deposits have invaded and damaged the inside of the Gannons' home and they refrain (as much as possible) from opening their windows and doors to reduce the accumulation of Visible Deposits in their homes. The Gannons struggle to keep the inside of their home clean. Mrs. Gannon feels like her home is never clean.

88. Visible Deposits accumulate on the Gannons' pet goats and on the land and water where the goats live. The Gannons are concerned for the health and welfare of the goats because the Visible Deposits have invaded and accumulated inside the fabric shed where hay for the goats is stored and the goats suffer from eye irritation and constantly have runny noses because of their exposure to Noxious and Hazardous Substances from the Facility.

89. The Noxious and Hazardous Substances on Plaintiffs' properties have contaminated and continue to contaminate Plaintiffs' property, including the air. Defendants have failed to prevent and/or remediate this contamination.

90. Plaintiffs are exposed to Noxious and Hazardous Substances, including Visible Deposits.

91. As a direct and proximate result of the release of Noxious and Hazardous Substances from the Facility, including Visible Deposits, Plaintiffs are no longer able to take pride in the condition of their properties.

92. Thus, as a direct and proximate result of the release of Noxious and Hazardous Substances from the Facility, including the Visible Deposits, the Plaintiffs have incurred and will continue to incur substantial damage to their properties.

93. Despite stories of operational improvements, the conditions referenced herein have continued and grown worse over the past two years.

94. Defendants knew or should have known of the danger posed to persons and the environment by the Noxious and Hazardous Substances which were emitted, released and otherwise disposed of in the neighboring community from the Facility.

95. For example, Defendants submit annual reports, which are certified to be true, accurate, and complete, to the Ohio EPA showing that the Facility emits thousands of tons of air contaminants, including NAAQS pollutants and toxic metals, into the air each year.

96. Defendants knew or should have known that the releases of Noxious and Hazardous Substances were likely to cause and have caused changes detrimental to the quality of the physical and human environment surrounding the Facility.

97. As a direct and proximate result of the Facility's release of Noxious and Hazardous Substances, including the Visible Deposits, there is an increase in both cancer and non-cancer risks to the Plaintiffs and other members of the public who are exposed or may be exposed to such substances, via vast routes of exposure, including inhalation, and thus may present an endangerment to health.

98. As a direct and proximate result of Defendants' acts and omissions, Plaintiffs have and/or will, inter alia:

a. suffer damage to their properties (and to flora and fauna on their properties, including trees, chickens, turkeys, a hog, and goats), including but not limited to, a reduction in the value of their properties, damage to the residue of their properties, damage and/or injury to structures on their property, damage from the wrongful taking of their properties, and the loss of use of their properties;

b. incur substantial damage to their properties;

c. suffer damage to their personal property, including damage to vehicles;

d. be deprived of the ability to use and enjoy, fully, their property without risking harm to themselves or others;

e. continue to suffer annoyance, worry, anxiety, fear, inconvenience, injury, discomfort, including physical discomfort, serious emotional distress and apprehension about their and their family members' health, mental anguish, loss of enjoyment of life, and fear of future disease;

f. have their comfort, health, welfare, and safety endangered;

g. incur costs attempting to make their property usable for its intended purposes, including attempting to clean up the Visible Deposits;

h. incur costs to restore their property to the condition before the property was damaged;

i. suffer repeated exposure to the Noxious and Hazardous Substances from the Facility, increasing or accelerating the threat of future disease and/or the aggravation of existing conditions/diseases; and

j. incur attorney fees, expert fees, and other litigation costs and expenses.

99. The precise amount of the compensatory damages outlined in the preceding paragraph will be proven with specificity at trial but currently exceed $850,000 for each family, exclusive of interest, fees, and costs.

CLAIMS AGAINST ALL DEFENDANTS

100. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

101. Defendants have frequently violated and will foreseeably continue to frequently violate the emission limits and operational standards in the Facility's PSD Permit. Collectively, these violations demonstrate the Defendants' wanton and reckless operation of the Facility, which releases Noxious and Hazardous Substances, in clear violation of law and regulation. Due to the violations set forth in the First through Twenty-Fifth Claims for Relief in this Complaint, Plaintiffs are entitled to injunctive relief and litigation costs under 42 U.S.C. § 7604. Further, the Court should issue an order requiring Defendants to pay civil penalties.

First Claim for Relief - Violations of the Air Pollution Nuisance Prohibition in the PSD Permit and Ohio SIP, O.A.C. § 3745-15-07

102. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

103. Under O.A.C. § 3745-15-07:

> ... the emission or escape into the open air from any source or sources whatsoever, of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, odors, or any other substances or combinations of substances, in such manner or in such amounts as to endanger the health, safety or welfare of the public, or cause unreasonable injury or damage to property, is hereby found and declared to be a public nuisance. It shall be unlawful for any person to cause, permit or maintain any such public nuisance.

104. O.A.C. § 3745-15-07 was approved by US EPA as part of the Ohio SIP on October 12, 1984. Additionally, compliance with the nuisance prohibition of O.A.C. § 3745-15-07 is an enforceable term of the Facility's PSD Permit. O.A.C. § 3745-15-07 is therefore federally enforceable by Plaintiffs through the Ohio SIP and under the Facility's permits.

105. In 2015, Ohio EPA revised O.A.C. § 3745-15-07 to clarify the rule without changing the intent of the rule. Under the revised O.A.C. § 3745-15-07 (effective July 20, 2015):

> (A) The emission or escape into the open air from any source or sources whatsoever, of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, or any other substances or combinations of substances, in such manner or in such amounts as to endanger the health, safety or welfare of the public, or cause unreasonable injury or damage to property, is hereby found and declared to be a public nuisance. It shall be unlawful for any person to cause, permit or maintain any such public nuisance.

> (B) The emission or escape into the open air from any source or sources of odors whatsoever that is subject to regulation under Chapter 3745-17, 3745-18, 3745-21, or 3745-31 of the Administrative Code and is operated in such a manner to emit such amounts of odor as to endanger the health, safety, or welfare of the public, or cause unreasonable injury or damage to property, is hereby found and declared to be a public nuisance. It shall be unlawful for any person to cause, permit or maintain any such public nuisance.

The Facility is subject to regulation under Chapter 3745-17, 3745-18, 3745-21, or 3745-31 of the Administrative Code. This revised nuisance provision is federally enforceable by Plaintiffs under the Facility's permits.

106. The Ohio air nuisance prohibition in O.A.C. § 3745-15-07 constitutes an "emission standard or limitation" under 42 U.S.C. § 7604(f).

107. Each Defendant is a "person" under O.A.C. § 3745-15-07. O.A.C. 3745-15-01(U).

108. The emissions from the Facility, as described herein, have been and continue to be released in such a manner or in such amounts as to endanger the health, safety or welfare of the public, including Plaintiffs, and have and continue to cause unreasonable injury or damage to property, including Plaintiffs' property.

109. For example, Noxious and Hazardous Substances, including the Visible Deposits, emitted from the Facility have created conditions that endanger the Plaintiffs' health, safety, and welfare and have caused unreasonable injury or damage to Plaintiffs' properties on, at least, the following exemplar dates: 9/4/2014; 9/10/2014; 9/17/2014; 9/20/2014; 10/7/2014; 10/14/2014; 10/15/2014; 10/17/2014; 11/3/2014; 11/4/2014; 11/11/2014;

11/18/2014; 11/22/2014; 11/24/2014; 12/27/2014; 1/17/2015; 2/7/2015; 2/8/2015; 2/15/2015; 3/7/2015; 3/8/2015; 3/13/2015; 3/16/2015; 3/21/2015; 3/26/2015; 4/2/2015; 4/3/2015; 4/5/2015; 4/7/2015; 4/8/2015; 4/9/2015; 4/12/2015; 4/13/2015; 5/3/2015; 5/4/2015; 5/5/2015; 5/10/2015; 5/11/2015; 5/12/2015; 5/15/2015; 5/24/2015; 5/25/2015; 5/26/2015; 5/29/2015; 6/9/2015; 6/10/2015; 6/11/2015; 6/12/2015; 6/13/2015; 6/18/2015; 6/21/2015; 6/22/2015; 6/23/2015; 7/9/2015; 7/17/2015; 8/19/2015; 9/14/2015; 10/8/2015; 10/13/2015; 11/4/2015; 11/5/2015; 11/11/2015; 11/19/2015; 12/4/2015; 12/6/2015; 12/12/2015; 12/21/2015; 1/14/2016; 1/30/2016; 2/5/16; 2/17/2016; 2/19/2016; 2/28/2016; 3/1/2016; 3/7/2016; 3/8/2016; 3/16/2016; 3/22/2016; 3/26/2016; 3/30/2016; 4/3/2016; 4/4/2016; 4/6/2016; 4/22/2016; 5/1/2016; 5/7/2016; 5/10/2016; 5/12/2016; 5/13/2016; 5/19/2016; 5/20/2016; 5/23/2016; 5/24/2016; 5/26/2016; 5/27/2016; 6/5/2016; 6/6/2016; 6/10/2016; 6/20/2016; 6/21/2016; 7/8/2016; 7/12/2016; 7/13/2016; 7/18/2016; 7/24/2016; 7/28/2016; 8/12/2016; 8/20/2016; 8/23/2016; 8/25/2016; 9/9/2016; 9/22/2016; 9/27/2016; 9/28/2016; 9/29/2016; 9/30/2016; 10/5/2016; 10/7/2016; 10/12/2016; 10/16/2016; 10/18/2016; 10/19/2016; 10/23/2016; 10/25/2016; 10/28/2016; 11/1/2016; 11/2/2016; 11/3/2016; 11/5/2016; 11/8/2016; 11/10/2016; 11/16/2016; 11/18/2016; 11/22/2016; 11/28/2016; 11/29/2016; 12/3/2016; 12/5/2016; 12/9/2016; 12/17/2016; 12/23/2016; 12/31/2016; 1/12/2017; 1/14/2017; 1/17/2017; 1/20/2017; 1/25/2017; 1/27/2017; 1/29/2017; 2/6/2017; 2/7/2017; 2/11/2017; 2/17/2017; 2/24/2017; 2/28/2017; 3/7/2017; 3/8/2017; 3/9/2017; 3/11/2017; 3/13/2017; 3/16/2017; 3/22/2017; 3/24/2017; 3/25/2017; 3/26/2017; 3/30/2017; 3/31/2017; 4/8/2017; 4/9/2017; 4/10/2017; 4/15/2017;

4/16/2017; 4/18/2017; 4/19/2017; 4/20/2017; 4/21/2017; 4/22/2017; 4/23/2017; 4/25/2017; 4/26/2017; 4/28/2017; 4/29/2017; 4/30/2017; 5/10/2017; 5/11/2017; 5/13/2017; 5/15/2017; 5/16/2017; 5/17/2017; 5/18/2017; 5/19/2017; 5/24/2017; 5/25/2017; 5/26/2017; 5/27/2017; 5/28/2017; 5/29/2017; 5/31/2017; 6/3/2017; 6/9/2017; 6/12/2017; 6/13/2017; 6/14/2017; 6/16/2017; 6/17/2017; 6/18/2017; 6/23/2017; 7/3/2017; 7/8/2017; 7/10/2017; 7/12/2017; 7/15/2017; 7/17/2017; 7/18/2017; 7/19/2017; 7/21/2017; 7/22/2017; 7/24/2017; 7/25/2017; 7/26/2017; 7/27/2017; 8/4/2017; 8/7/2017; 8/9/2017; 8/10/2017; 8/11/2017; 8/12/2017; 8/14/2017; 8/16/2017; 8/19/2017; 8/20/2017; 8/22/2017; 8/25/2017; 8/26/2017; 8/28/2017; 8/29/2017; 8/30/2017; 9/2/2017; 9/3/2017; 9/4/2017; 9/5/2017; 9/6/2017; 9/11/2017; 9/13/2017; 9/14/2017; 9/16/2017; 9/17/2017; 9/18/2017; 9/20/2017; 9/21/2017; 9/22/2017; 9/24/17; 9/25/17; and 9/29/2017.

110. The emissions from the Facility are an ongoing public air nuisance and violate Ohio's prohibition against air pollution nuisances, O.A.C. § 3745-15-07. Therefore, Plaintiffs are entitled to injunctive relief and litigation costs under 42 U.S.C. § 7604. Further, the Court should issue an order requiring Defendants to pay civil penalties for such air pollution nuisance.

Second Claim for Relief - Violations of the PSD Permit, Ohio SIP, the NESHAPs, and the CAA for failure to visually inspect each oven prior to pushing and pushing without visual inspection (P901 and P902)

111. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

112. The Facility's PSD Permit and the NESHAPs (40 C.F.R. § 63.7293(a)) require Defendants to: (1) visually inspect each oven prior to pushing by opening the door damper and observing the bed of coke; and (2) not push the oven unless the visual inspection indicates that there is no smoke in the open space above the coke bed and that there is an unobstructed view of the door on the opposite side of the oven.

113. Each of these requirements is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

114. Defendants have repeatedly violated, and will foreseeably continue to violate, the PSD Permit and the NESHAPs by failing to conduct the required visual inspection prior to pushing coke, resulting in an unobserved green push, and by pushing ovens without the visual inspection indicating that there is no smoke in the open space above the coke bed and that there is an unobstructed view of the door on the opposite side of the oven. For example, Defendants failed to adhere to these requirements on, at least, the following dates: 9/17/2014; 9/20/2014; 10/7/2014; 11/3/2014; 11/11/2014; 11/24/2014; 2/15/2015; 6/10/2015; 10/13/2015; 10/25/2015; 1/30/2016; 10/28/2016; 11/2/2016; 11/3/2016; 11/5/2016; 11/16/2016; 11/28/2016; 12/9/2016; 12/23/2016; 1/17/2017; 1/27/2017; 2/7/2017; 3/11/2017; 3/16/2017; 3/25/2017; 4/10/2017; 4/16/2017; 4/18/2017; 4/19/2017; 5/10/2017; 5/11/2017; 7/21/2017; 8/4/2017; 8/19/2017; 8/20/2017; 8/22/17; 8/26/2017; 8/29/2017; 9/4/2017; 9/6/2017; and 9/25/2017. Each such failure is a

violation of the Facility's PSD Permit, Ohio SIP, the NESHAPs, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

115. The frequent green-pushing events, among other acts and/or omissions of the Defendants, have led and will continue to lead to odors and/or associated coughing, gagging, nausea or vomiting, heartburn, burning or irritated eyes, sinus drainage and congestion, shortness of breath, vertigo, headaches, including migraine-like headaches, scratchy throats, phlegm, and an unpleasant, foreign taste in the mouth or back of the throat for area residents, including Plaintiffs, if the relief requested herein is not fully granted.

Third Claim for Relief - Violations of the PSD Permit, Ohio SIP, the NESHAPs, and the CAA for failure to operate and maintain an emission control system for the capture and collection of emissions in a manner consistent with good air pollution control practices for minimizing emissions from the charging operation (P901 and P902)

116. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

117. The PSD Permit and the NESHAPs (40 C.F.R. § 63.303(b)(2)) require the Facility to install, operate and maintain an emission control system for the capture and collection of emissions in a manner consistent with good air pollution control practices for minimizing emissions from the charging operations.

118. This requirement is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

119. Defendants have repeatedly violated, and will foreseeably continue to violate, the PSD Permit and NESHAPs by failing to operate and maintain an emission control system for the capture and collection of emissions from the charging operations in a manner consistent with good air pollution control practices. For example, on P901, Defendants failed to operate and maintain the emission control system from the charging operations in a manner consistent with good air pollution control practices on at least the following dates during charging of the following ovens: Oven 93 on July 17, 2013; Oven 85 on August 22, 2013; Oven 99 on August 26, 2013; Oven 96 on September 10, 2013; Oven 100 on September 10, 2013; Oven 16 on October 20, 2013; Oven 32 on October 20, 2013; Oven 96 on October 22, 2013; Oven 21 on October 29, 2013; Oven 23 on October 29, 2013; Oven 15 on November 8, 2013; Oven 59 on November 8, 2013; Oven 80 on December 13, 2013; Oven 86 on January 16, 2014; Oven 100 on February 9, 2014; Oven 71 on March 26, 2014; and Oven 92 on July 14, 2015. For P902, this requirement was violated on at least the following dates during charging of the following ovens: Oven 126 on July 12, 2013; Oven 126 on July 22, 2013; Oven 155 on August 26, 2013; Oven 121 on October 19, 2013; Oven 123 on November 8, 2013; Oven 107 on November 22, 2013; Oven 103 on November 28, 2013; Oven 140 on November 29, 2013; Oven 124 on December 5, 2013; Oven 160 on December 11, 2013; Oven 124 on February 1, 2014; Oven 107 on March 6, 2014; Oven 108 on March 23, 2014; and Oven 148 on November 11, 2015. Each such failure is a violation of the Facility's PSD Permit, Ohio SIP, the

NESHAPs, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Fourth Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for exceeding the waste gas stack sulfur dioxide emissions limits (P901 and P902)

120. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

121. The PSD Permit limits sulfur dioxide emissions from the waste gas stacks to 192.0 pounds per hour, based on a 3-hour block average.

122. This limit is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

123. Defendants have repeatedly violated, and will foreseeably continue to violate, the PSD permit by exceeding the 192.0 pound per hour sulfur dioxide emissions limit. For example, sulfur dioxide emissions exceeded the 192.0 pound per hour limit for one or more 3-hour blocks on at least the following dates for P901 and P902: July 26, 2013; August 22, 2013; October 7, 2013; October 20, 2013; December 14, 2013; February 10, 2014 (two 3-hour blocks); May 5, 2014; May 9, 2014; May 10, 2014; May 15, 2014; May 18, 2014; May 19, 2014 (two 3-hour blocks); May 21, 2014; June 10, 2014; June 25, 2014; July 13, 2014; September 22-24, 2014 (twelve 3-hour blocks); June 14, 2015; June 30, 2015; August 20, 2015; December 9, 2015 (two 3-hour blocks); January 25, 2016 (two 3-hour blocks); February 22, 2016; August 31, 2016 (P901); August 31, 2016 (P902); September 8, 2016; September 10, 2016 (two 3-hour blocks); September 11, 2016 (four 3-hour blocks);

September 22, 2016; October 3, 2016; October 4-5, 2016 (four 3-hour blocks); October 10-11, 2016 (five 3-hour blocks); November 25, 2016 (two 3-hour blocks); December 15, 2016; and February 28, 2017 (two 3-hour blocks). Each such exceedance is a violation of the Facility's PSD Permit, Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Fifth Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for maintaining FGD baghouse pressure drops outside the specified permit range (P901 and P902)

124. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

125. The PSD Permit, effective November 10, 2008, requires that the pressure drops across the P901 and P902 Flue Gas Desulfurization (FGD) baghouses (also called the waste gas exhaust baghouses) be maintained within the range of 3 to 12 inches of water. The PSD Permit was modified, effective February 19, 2015, to revise the required pressure drop range to 3 to 15 inches of water.

126. This requirement is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

127. Defendants have repeatedly violated, and will foreseeably continue to violate, the PSD Permit by failing to maintain the pressure drop on the FGD baghouses within the required ranges. For example, the pressure drop across the P901 FGD baghouse was outside the effective specified range on at least the following dates:

January 18, 2016; June 4, 2016; July 14, 2016; July 26, 2016; August 31, 2016; September 12, 2016; October 18, 2016; October 29, 2016; November 3, 2016; December 19, 2016; and March 4, 2017 and the pressure drop across the P902 FGD baghouse was outside the effective specified range on at least the following dates: November 19, 2013; November 24, 2013; November 25, 2013; January 1, 2014; January 2, 2014; January 13, 2014; January 16, 2014; May 21, 2014; June 10, 2014; September 7, 2014; September 22, 2014; September 23, 2014; November 20, 2014; June 14, 2015; December 9, 2015; January 18, 2016; September 11, 2016; October 1, 2016; October 7, 2016; November 25, 2016; November 30, 2016; December 12, 2016; and February 15, 2017. Each such exceedance is a violation of the Facility's PSD Permit, Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Sixth Claim for Relief - Violations of the PSD Permit, Ohio SIP, the NESHAPs, and the CAA for failure to observe each coke oven door after charging and to record the oven number of any door from which visible emissions occur (P901 and P902)

128. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

129. The PSD Permit and the NESHAPs (40 C.F.R. § 63.303(c)(1)) require the Facility to observe each coke oven door after charging and record the oven number of any door from which visible emissions occur.

130. These requirements are each an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

131. Defendants have repeatedly violated, and will foreseeably continue to violate, the PSD Permit and NESHAPs by failing to observe each coke oven door after charging and to record the oven number of any door from which visible emissions occur. For example, Defendants failed to observe each coke oven door after charging and to record the oven number of any door from which visible emissions occur for at least the following ovens on the following dates: Oven 88 on July 14, 2015; Oven 79 on August 4, 2015; Oven 87 on August 28, 2015; Oven 141 on September 15, 2015; Oven 18 on November 5, 2015; Oven 38 on November 5, 2015; Oven 58 on November 5, 2015; Oven 32 on December 3, 2015; Oven 12 on December 11, 2015; Oven 192 on January 22, 2016; Oven 93 on January 23, 2016; Oven 97 on January 23, 2016; and Oven 129 on January 23, 2016. Each such failure is a violation of the Facility's PSD Permit, Ohio SIP, the NESHAPs, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Seventh Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for violations of the requirement that no more than one bypass vent stack be open at a time (P901 and P902)

132. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

133. The PSD Permit only allows one bypass vent stack to be open (or, "in use") at P901 or P902 at any time.

134. This restriction is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

135. Defendants have repeatedly violated, and will foreseeably continue to violate, the PSD permit prohibition on having more than one bypass vent stack in use at any time. For example, more than one bypass vent stack was in use at one time on at least the following dates: October 4, 2013; May 5, 2014; May 15, 2014; May 16, 2014; September 7, 2014; September 29, 2014; October 12, 2014; November 11, 2014; February 11, 2015; June 14, 2015; September 28, 2015; July 2, 2015; December 9, 2015; January 18, 2016; February 18, 2016; May 10, 2016; May 11, 2016; May 15, 2016; four times on August 2, 2016; September 1, 2016; September 11, 2016; October 29, 2016; November 3, 2016; December 12, 2016; March 1, 2017; and March 4, 2017. Each such exceedance is a violation of the Facility's PSD Permit, Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Eighth Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for maintaining coke crushing/screening baghouse pressure drops outside the specified permit range (F004)

136. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

137. The PSD Permit requires that the pressure drop across the coke crushing/screening baghouse be maintained within the range of 3 to 12 inches of water.

138. This requirement is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

139. Defendants have repeatedly violated, and will foreseeably continue to violate, the PSD Permit by failing to maintain the pressure drop across the coke crushing/screening baghouse within the range of 3 to 12 inches of water. For example, the pressure drop across the coke crushing/screening baghouse was outside the specified range on or between the following dates: at least once on October 29, 2014; at least once on November 6, 2014; at least 111 times between September 10, 2015 and October 20, 2015; at least once on March 6, 2016; at least once on April 29, 2016; and "multiple times" between June 21, 2016 and June 22, 2016. Each such failure is a violation of the Facility's PSD Permit, Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Ninth Claim for Relief - Violations of the PSD Permit, Ohio SIP, the NESHAPs, and the CAA for failure to clean the quench tower baffles once each day (P001 and P002)

140. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

141. The PSD Permit and the NESHAPs (40 C.F.R. § 63.7295(b)(2)) require the Facility to wash the baffles in each quench tower once each day.

142. This requirement is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

143. Defendants have violated, and will foreseeably continue to violate, the PSD Permit and the NESHAPs by failing to wash the baffles in each quench tower once each day. For example, Defendants failed to wash the baffles in the P001 quench tower on at least November 7, 2015 and January 17, 2016 and failed to wash the baffles in the P002 quench tower on at least August 15, 2014 and November 7, 2015. In addition, the Responsible Parties failed to wash the P002 baffles on "at least 13 days" from August 6 through August 18, 2015 and failed to wash the P001 and P002 baffles on "...days going back as early as October 2014." Each such failure is a violation of the Facility's PSD Permit, Ohio SIP, the NESHAPs, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Tenth Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for failure to process waste gas from coking by the use of a lime spray dryer and a baghouse (P901 and P902)

144. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

145. The PSD Permit requires that waste gas from coking be processed by the use of a lime spray dryer for SO_2 control and a baghouse for PM control.

146. This requirement is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

147. Defendants have repeatedly violated, and will continue to violate, the PSD permit by failing to process waste gas from coking by the use of a lime spray dryer and

a baghouse. For example, Defendants failed to process waste gas from coking by the use of a lime spray dryer and a baghouse on at least the following dates for P901 or P902: April 1, 2015; April 13, 2015; June 15, 2015; December 9, 2015; January 18, 2016; April 1, 2016; May 10, 2016; May 11, 2016; September 11, 2016; October 7, 2016; November 29, 2016; February 27, 2017; and March 4, 2017. Each such failure is a violation of the Facility's PSD Permit, Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Eleventh Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for failure to maintain daily inspection records of visible emissions and wind erosion for the open coal storage piles (F002)

148. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

149. The PSD Permit requires the Facility to maintain daily inspection records of visible emissions and wind erosion for the open coal storage piles.

150. This requirement is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

151. Defendants have violated, and will foreseeably continue to violate, the PSD permit by failing to maintain the required daily inspection records. For example, Defendants failed to maintain the required daily inspection records from, at least, November 1, 2014 through November 30, 2014. Each such failure is a violation of the

Facility's PSD Permit, Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Twelfth Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for failure to record the pressure drop across the coke crushing/screening baghouse (F004)

152. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

153. The PSD Permit requires the pressure drop across the coke crushing/screening baghouse to be recorded on a once per shift basis.

154. This requirement is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

155. Defendants have violated, and will foreseeably continue to violate, the PSD Permit by failing to record the pressure drop across the coke crushing/screening baghouse on a once per shift basis. For example, Defendants failed to record the pressure drop across the coke crushing/screening baghouse during at least one shift on at least the following dates: June 1, 2013; June 2, 2013; October 11, 2013; August 2, 2014; and December 11, 2014. Each such failure is a violation of the Facility's PSD Permit, Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Thirteenth Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for exceeding the pounds of PM_{10} per ton of coal emission limitation (P002)

156. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

157. The PSD Permit limits the pounds of PM_{10} emissions from the quench tower to 0.05 pounds per ton of coal.

158. This limit is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

159. Defendants have violated, and will foreseeably continue to violate, the PSD permit by exceeding the 0.05 pounds of PM_{10} per ton of coal emissions limitation. For example, this PM_{10} limit was exceeded on, at least, October 5, 2016 and October 18, 2016. Each such exceedance is a violation of the Facility's PSD Permit, Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Fourteenth Claim for Relief - Violations of the PSD Permit, Ohio SIP, the NESHAPs, and the CAA for violations of the prohibition on more than one coke oven door leak during a given oven's coking cycle (P901 and P902)

160. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

161. The PSD Permit and the NESHAPs (40 C.F.R. § 63.303(c)(2)) prohibit more than one coke oven door leak during a given oven's coking cycle.

162. This limit is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

163. Defendants have violated, and will foreseeably continue to violate, the PSD Permit's and the NESHAPs' prohibition on more than one coke oven door leak during a given oven's coking cycle. For example, more than one coke oven door leak occurred during at least the following ovens' coking cycles on at least the following dates: Oven 20 on July 8, 2013; Oven 173 on February 12, 2014; Oven 1 on May 3, 2014; Oven 99 on July 27, 2015; and Oven 6 on August 15, 2015. Each such exceedance is a violation of the Facility's PSD Permit, Ohio SIP, the NESHAPs, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Fifteenth Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for exceeding the maximum daily wet coal usage limit (P901)

164. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

165. The PSD Permit imposes a maximum daily wet coal usage rate of 2,400 wet tons per day for P901.

166. This limit is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

167. Defendants have violated, and will foreseeably continue to violate, the PSD Permit by exceeding the maximum daily wet coal usage rate of 2,400 wet tons per day. For example, the 2,400 wet tons per day limit was exceeded on at least January 25, 2014 and March 15, 2014. Each such exceedance is a violation of the Facility's PSD

Permit, Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Sixteenth Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for maintaining pushing charging machine baghouse pressure drops outside the specified permit range (P901)

168. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

169. The PSD Permit requires that the pressure drop across the pushing charging machine (PCM) baghouse be maintained within the range of 3 to 12 inches of water.

170. This requirement is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

171. Defendants have repeatedly violated, and will foreseeably continue to violate, the PSD permit by failing to maintain the pressure drop on the PCM baghouse within the required range. For example, the pressure drop across the PCM baghouse was outside the specified range on at least the following dates: April 9, 2013; April 10, 2013; April 11, 2013; April 12, 2013; April 13, 2013; April 14, 2013; April 19, 2013; and May 7, 2016. Each such exceedance is a violation of the Facility's PSD Permit, Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Seventeenth Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for exceeding the visible particulate emissions limitations from the PCM baghouse (P901)

172. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

173. The PSD Permit prohibits visible particulate emissions from the PCM baghouse stack from exceeding 10% opacity as a 6-minute average.

174. This limit is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

175. Defendants have violated, and will foreseeably continue to violate, the PSD permit by exceeding the PCM baghouse visible particulate emissions limit of 10% opacity as a 6-minute average. For example, the opacity limit was exceeded on at least June 26, 2015 and April 25, 2016. Each such exceedance is a violation of the Facility's PSD Permit, Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Eighteenth Claim for Relief - Violations of the PSD Permit, Ohio SIP, the NESHAPs, and the CAA for failure to operate and maintain air pollution control and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions (P901 and P902)

176. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

177. The PSD Permit and the NESHAPs (40 C.F.R. § 63.7300(a)) require the Facility to operate and maintain air pollution control and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions.

178. This requirement is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

179. Defendants have violated, and will foreseeably continue to violate, the PSD Permit and the NESHAPs by failing to operate and maintain air pollution control and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions. For example, the air pollution control and monitoring equipment for the capture and collection of emissions during pushing operations was not operated and maintained in a manner consistent with good air pollution control practices for minimizing emissions for P901 or P902 on at least the following dates: September 9, 2015; December 23, 2015; December 1, 2016; December 15, 2016; December 24, 2016; and January 9, 2017. Each such failure is a violation of the Facility's PSD Permit, Ohio SIP, the NESHAPs, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Nineteenth Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for maintaining common tunnel temperatures outside the specified permit range (P901 and P902)

180. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

181. The PSD Permit requires the Facility to operate and maintain the common tunnel temperatures at a minimum of 1,400 °F.

182. This requirement is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

183. Defendants have violated, and will continue to violate, the PSD Permit by failing to maintain the minimum common tunnel temperature. For example, Defendants failed to maintain the minimum common tunnel temperature on at least the following dates and times: January 7, 2014 at 4:28 pm; January 7, 2014 at 11:34 pm; January 7, 2014 at 10:34 pm; January 8, 2014 at 11:00 am; and "intermittently" from January 7, 2014 at 10:46 pm through January 8, 2014 at 4:01 pm. Each of these exceedances is a violation of the PSD Permit, the Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Twentieth Claim for Relief - Violations of the PSD Permit, Ohio SIP, the NESHAPs, and the CAA for failure to operate the ovens under negative pressure (P901 and P902)

184. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

185. The PSD Permit and the NESHAPs (40 C.F.R. § 63.303(b)(1)) limit coke oven emissions from the non-recovery coke oven batteries to 0.0 percent leaking coke oven doors and require the Facility to monitor and record the pressure in each oven or in the common tunnel to ensure that the ovens are operated under a negative pressure.

186. The Ohio air nuisance prohibition in O.A.C. § 3745-15-07 constitutes an "emission standard or limitation" under 42 U.S.C. § 7604(f).

187. Defendants have repeatedly violated, and will continue to violate, the PSD Permit and the NESHAPs by failing to operate the ovens under negative pressure. For example, Defendants failed to maintain negative pressure in the ovens on at least the following dates: September 29, 2014; October 12, 2014; November 11, 2014; February 11, 2015; June 14, 2015; and January 18, 2016. Each such failure is a violation of the Facility's PSD Permit, Ohio SIP, the NESHAPs, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Twenty-First Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for exceeding the visible particulate emissions limitations from the waste gas exhaust stacks (P901 and P902)

188. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

189. The PSD Permit prohibits visible particulate emissions from the P901 and P902 waste gas exhaust stacks from exceeding 10% opacity as a 6-minute average.

190. This limit is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

191. Defendants have violated, and will foreseeably continue to violate, the PSD Permit by exceeding the waste gas exhaust stacks visible particulate emissions limit of 10% opacity as a 6-minute average. For example, visible particulate emissions

exceeded 10% opacity as a 6-minute average from the waste gas exhaust stacks on at least March 30, 2015 and on December 17, 2016. Each such exceedance is a violation of the Facility's PSD Permit, Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Twenty-Second Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for exceeding bypass venting limits (P901 and P902)

192. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

193. The PSD Permit limits venting from the P901 and P902 bypass vent stacks to 192 hours per vent stack per rolling 12-month period.

194. This limit constitutes an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

195. Defendants have violated, and will foreseeably continue to violate, the PSD permit by exceeding the bypass venting limit. For example, Defendants exceeded the bypass venting limit for at least 15 rolling months from at least December 2013 through June 2014 on P901 and from at least June 2014 through January 2015 on P902. Each such exceedance is a violation of the Facility's PSD Permit, Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Twenty-Third Claim for Relief - Violations of the PSD Permit, Ohio SIP, and the CAA for failure to operate the activated carbon injection system (P902)

196. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

197. The PSD Permit requires operation and maintenance of an activated carbon injection system for the control of mercury emissions, which must be operated at all times when one or more of the associated P902 ovens are operated and in a manner that will maximize the removal efficiency for mercury.

198. This requirement is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

199. Defendants have violated, and will foreseeably continue to violate, the PSD permit by failing to operate and maintain an activated carbon injection system at all times when one or more of the associated ovens are operated and in a manner that will maximize the removal efficiency for mercury. For example, Defendants failed to operate the carbon injection system on at least the following dates: October 23, 2015; December 9, 2015; January 18, 2016; September 11, 2016; and December 12, 2016. Each of these failures is a violation of the PSD Permit, the Ohio SIP, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Twenty-Fourth Claim for Relief - Violations of the PSD Permit, Ohio SIP, the NESHAPs, and the CAA for failure to record the pressure drop across each multiclone dust collector during the push of each oven (P901 and P902)

200. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

201. The PSD Permit and the NESHAPs (40 C.F.R. §§ 63.7330, 63.7331(k)) require the pressure drop across each multiclone dust collector be measured and recorded during each push.

202. This requirement is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

203. Defendants have violated, and will foreseeably continue to violate, the PSD Permit by failing to measure and record the pressure drop across each multiclone dust collector during each push. For example, Defendants failed to record the pressure drop across the multiclone dust collector while pushing at least one P902 oven on, at least, August 17, 2013 and while pushing at least two P901 ovens on, at least, July 21, 2015. Each of these failures is a violation of the PSD Permit, the Ohio SIP, the NESHAPs, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Twenty-Fifth Claim for Relief - Violations of the PSD Permit, Ohio SIP, the NESHAPs, and the CAA for failure to record the fan amp reading on each multiclone dust collector at least once every eight hours (P901 and P902)

204. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

205. The PSD Permit and the NESHAPs (40 C.F.R. § 63.7333(d)) require the fan amp reading be checked and recorded at least once every 8 hours on each multiclone dust collector.

206. This requirement is an "emission standard or limitation" under 42 U.S.C. § 7604(f)(1), 42 U.S.C. § 7604(f)(3), and 42 U.S.C. § 7604(f)(4).

207. Defendants have repeatedly violated, and will foreseeably continue to violate, the PSD Permit and the NESHAPs by failing to check and record the fan amp reading on each multiclone dust collector at least once every 8 hours. For example, Defendants failed to record the fan amp reading at least once every 8 hours on at least the following dates: June 12, 2014; December 10, 2014; and January 1, 2015. Each of these failures is a violation of the PSD Permit, the Ohio SIP, the NESHAPs, and the CAA. Such violations will continue if the relief requested herein is not fully granted.

Twenty-Sixth Claim for Relief - Negligence

208. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

209. At all times relevant herein, Defendants negligently caused or threaten to cause the contamination of the soil, surface water, sediment, groundwater, and air at and about the Facility, including the Plaintiffs' property, and failed to warn Plaintiffs of the contamination.

210. At all times relevant hereto, Defendants owed and owe a duty to Plaintiffs to inter alia:

a. Prevent Noxious and Hazardous Substances from the Facility from contaminating the environment, including the air, soil, ground, surface water, sediments and groundwater at and about the Plaintiffs' property;

b. Operate and maintain the Facility in a manner that would prevent Plaintiffs' exposure to the Facility's Noxious and Hazardous Substances;

c. Advise the potentially affected members of the public, including the Plaintiffs, of the degree of danger associated with the release of the Noxious and Hazardous Substances; and

211. Defendants knew or should have known that the releases of Noxious and Hazardous Substances were likely to cause and have caused changes detrimental to the quality of the physical and human environment surrounding the Facility.

212. Defendants have breached and will continue to breach the duties outlined above, resulting in substantial damage to Plaintiffs' property, Plaintiffs' exposure to Noxious and Hazardous Substances, and otherwise injuring the Plaintiffs, as set forth herein. Defendants have also failed to exercise the level of care that a careless person would use.

213. Defendants' conscious disregard for the rights and safety of Plaintiffs has caused substantial harm to Plaintiffs and their properties and has a great probability of causing further substantial harm.

214. In addition, Defendants have breached the statutory duties prescribed by federal and state law, as set forth herein, and including by Ohio Revised Code ("R.C.") Chapters 3704 and 3767 and regulations promulgated thereunder. Violations of these standards give rise to negligence per se.

215. As a direct and proximate result of the foregoing negligent and/or wanton and/or reckless acts or omissions of Defendants:

a. Plaintiffs' property has been harmed;

b. Plaintiffs have suffered loss of use and enjoyment of their properties, annoyance and discomfort, and mental anxiety and distress over future diseases, including cancer; and

c. Plaintiffs have suffered and will continue to suffer injuries and damages, as described herein.

216. Said negligent conduct and resulting harms, injuries, and damages to Plaintiffs are reasonably certain to continue.

217. Defendants are jointly and severally liable for all of said direct and consequential damages. Further, Defendants are jointly and severally liable for all special and punitive damages, as set forth herein.

Twenty-Seventh Claim for Relief - Violations of the Public Nuisance Prohibition under Ohio law, R.C. § 3767.13

218. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

219. The emissions from the Facility, as described herein including noxious exhalations or noisome or offensive smells, have been and continue to be released in such a manner or in such amounts as to be injurious to the health, comfort, or property of individuals, including Plaintiffs, or of the public, including Plaintiffs, as confirmed by recent $PM_{2.5}$ data.

220. Thus, the emissions from the Facility constitute an ongoing public nuisance and are a violation of Ohio's prohibition against public nuisances, R.C. § 3767.13.

221. Under R.C. § 3767.13(A), "[n]o person shall erect, continue, use, or maintain a building, structure, or place for the exercise of a trade, employment, or business, … which, by occasioning noxious exhalations or noisome or offensive smells, becomes injurious to the health, comfort, or property of individuals or of the public."

222. Each Defendant is a "person" within the meaning of R.C. § 3767.13.

223. The Facility is a "building, structure, or place for the exercise of a trade, employment, or business" within the meaning of R.C. § 3767.13.

224. R.C. § 3767.03 authorizes "any person who is a citizen of the county in which the nuisance exists" to commence a civil action "to abate the nuisance and to perpetually enjoin the person maintaining the nuisance from further maintaining it."

225. Each Plaintiff is a "person" within the meaning of R.C. § 3767.13. R.C. § 3767.01(B).

226. Each Plaintiff is a citizen of Scioto County.

227. The Facility is located in Scioto County.

228. The public nuisance caused by Defendants is ongoing and Defendants will foreseeably continue to violate Ohio's prohibition against public nuisances. Therefore, Plaintiffs are entitled to injunctive relief under R.C. § 3767.

Twenty-Eighth Claim for Relief - Nuisance

229. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

230. By wrongfully causing contamination of the air and depositing Noxious and Hazardous Substances on the Plaintiffs' properties, the Defendants' acts and omissions described herein amount to a private and public nuisance, both absolute and qualified, which has proximately injured, annoyed, and endangered the comfort, health, and safety of the Plaintiffs and rendered them insecure in their life and the use of their property.

231. Defendants' ongoing tortious conduct and continuing intentional, unreasonable, unlawful, knowing, wanton, reckless, and/or negligent acts and omissions have caused and will continue to cause Noxious and Hazardous Substances, including Visible Deposits, to frequently escape from the Facility and invade, settle, and threaten to contaminate the air, ground, groundwater, surface water, soil, sediment, biota, and property of the Plaintiffs, rendering said property unfit.

232. The release of Noxious and Hazardous Substances from the Facility occurs frequently, often without warning, and at varying times of day or night. Defendants have had and continue to have control over the Facility, continuing to make numerous unsuccessful changes to the Facility that do not abate the releases of Noxious and Hazardous Substances or the violations of law alleged herein. Indeed, the facts show that conditions have worsened the past two years.

233. The acts and omissions of the Defendants were and are being conducted in a manner that constitutes a nuisance under Ohio law including, but not limited to, common law.

234. In addition, because the releases of Noxious and Hazardous Substances, including Visible Deposits, violate O.A.C. § 3745-15-07, Defendants' acts and omissions also constitute a public nuisance, including an absolute public nuisance. Plaintiffs have suffered injuries distinct from those suffered by the public at large, as set forth herein.

235. Defendants have and continue to negligently and carelessly cause the Noxious and Hazardous Substances, including the Visible Deposits, to harm the Plaintiffs' property, which has unreasonably and wrongfully deprived Plaintiffs of the ability to fully use and enjoy their property and has damaged Plaintiffs' property. Defendants' acts and omissions constitute a private nuisance.

236. The Defendants have also violated statutory duties prescribed by Federal and state law as set forth herein, including R.C. Chapters 3704 and 3767 and regulations

promulgated thereunder. These violations have proximately caused Plaintiffs to suffer annoyance, injury, and inconvenience and have endangered the comfort, health, and safety of the Plaintiffs. Violations of these statutory and regulatory standards also give rise to nuisance per se, also known as an absolute nuisance.

237. Because the Defendants negligently and carelessly caused the Noxious and Hazardous Substances, including the Visible Deposits, to contaminate the Plaintiffs' property, the Defendants created a potential and unreasonable risk of harm, which, in due course, resulted in injury. The Defendants' acts and omissions also constitute a qualified nuisance.

238. The Defendants knew or should have known of the Noxious and Hazardous Substances being released from the Facility. They failed to adequately warn the Plaintiffs of the adverse effects of those materials.

239. As a direct and proximate result of Defendants' intentional, knowing, wanton and reckless and/or negligent creation of a nuisance:

a. Defendants have decreased the value of the property of the Plaintiffs;

b. Defendants have endangered the comfort, health, and safety of the Plaintiffs;

c. Plaintiffs have suffered annoyance, inconvenience, and other injuries;

d. Plaintiffs have suffered and will suffer increased risk of impaired health.

e. Plaintiffs' property and the environment have been harmed and will continue to be harmed;

f. The Plaintiffs have been deprived of use and enjoyment of their property;

g. Plaintiffs have suffered annoyance and discomfort, including physical discomfort; and

h. Plaintiffs have suffered and will suffer the other injuries and damages as set forth herein.

240. Said nuisance is reasonably certain to continue.

241. As long as the Defendants' nuisance continues, the damages and injuries to the Plaintiffs will continue.

242. The Defendants are jointly and severally liable for all direct and consequential damages and for such other relief as will abate and remediate the nuisance and its short-term and long-term effects. Defendants are also jointly and severally liable due to the harm posed by the past, present, and future nuisance, as provided by the Restatement of Torts (Second) § 929, including annoyance and discomfort damages, reduction in the value of Plaintiffs' properties and/or the costs to restore Plaintiffs' properties to their condition before the nuisance, and damages for loss of use of the properties for the period of the nuisance. Further, Defendants are jointly and severally liable for all special and punitive damages, as set forth herein.

Twenty-Ninth Claim for Relief - Trespass

243. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

244. Defendants, by the foregoing acts and omissions, caused and will continue to cause Noxious and Hazardous Substances, including the Visible Deposits, to escape from the Facility and to invade the air, ground, ground water, surface water, soils, sediments, biota and property of the Plaintiffs. Said invasion was or should have been reasonably foreseeable to Defendants.

245. Defendants were or should have been substantially certain that the release of Noxious and Hazardous Substances from the Facility would result in an invasion of Plaintiffs' properties.

246. Plaintiffs, who have never authorized said invasion of their property by these Noxious and Hazardous Substances, including Visible Deposits, have record title to and exclusive possession of the land invaded by the contaminants and have a property interest in the groundwater underlying that land.

247. The presence of these Noxious and Hazardous Substances, including Visible Deposits, on Plaintiffs' properties constitutes a continuing trespass. The Noxious and Hazardous Substances, including Visible Deposits, on Plaintiffs' properties, are present at levels that present a threat to health and welfare. Defendants' continued release of the Noxious and Hazardous Substances will further exacerbate the damage

resulting to Plaintiffs from the ongoing trespass. Defendants' tortious conduct, which is the direct and proximate cause of the trespass, continues.

248. Such trespass is reasonably certain to continue.

249. As a direct and proximate result of Defendants' intentional, knowing, wanton, reckless, and/or negligent acts and omissions:

a. Plaintiffs' land and the environment have been physically harmed and will continue to be harmed;

b. Plaintiffs' land and the environment have been substantially damaged and will continue to be substantially damaged;

c. Plaintiffs have suffered and continue to suffer actual and substantial interference with use and enjoyment of their properties and annoyance and discomfort; and

d. The Plaintiffs have suffered and will suffer the injuries and damages set forth herein.

250. As a direct and proximate result of Defendants' intentional, knowing, wanton, reckless, and/or negligent acts and omissions, Defendants are jointly and severally liable for direct and consequential damages resulting from said trespass and for such other relief as may be necessary to prevent and remediate the trespass. Defendants are jointly and severally liable for injury caused and/or the harm posed by the past, present, and future trespass to Plaintiffs' land, as provided by the Restatement

of Torts (Second) § 929, including damages for annoyance and discomfort, reduction in the value of Plaintiffs' properties and/or the costs to restore Plaintiffs' properties to their condition before the trespass, and damages for loss of use of the properties for the period of the trespass. Further, Defendants are jointly and severally liable for special damages that resulted from said trespass and for punitive damages, as set forth herein.

Thirtieth Claim for Relief - Ultrahazardous or Abnormally Dangerous Activity

251. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

252. The Plaintiffs and their property have been exposed to and otherwise injured by Noxious and Hazardous Substances that have been released from the Facility as a direct and proximate result of the Defendants' acts and omissions. The disposal, storage, generation, handling and release of said Noxious and Hazardous Substances is an abnormally dangerous or ultrahazardous activity in which the Defendants are and have been engaged.

253. By reason of carrying on such activities which directly, proximately and foreseeably caused the invasion of and substantial harm to the Plaintiffs' properties and the surrounding environment, each Defendant is strictly liable to the Plaintiffs even if they exercised the utmost care to prevent the harm, which the Defendants nonetheless failed to do. This liability arises pursuant to the Restatement of Torts (Second) §§ 519 and 520.

254. The Defendants directly and proximately caused the injuries to the Plaintiffs described herein, including mental anguish, property damage, loss of enjoyment of life and property, annoyance and discomfort, and fear of future disease.

255. Defendants' conscious disregard for the rights and safety of Plaintiffs has caused substantial harm to Plaintiffs and their properties and has a great probability of causing further substantial harm. As a direct and proximate result of the contamination caused by Defendants' activities, the Plaintiffs suffered all of the injuries and damages described herein. The Defendants are jointly and severally liable for all such direct, consequential, special, and punitive damages, as set forth herein.

Thirty-First Claim for Relief - Negligent Infliction of Emotional Distress

256. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

257. As described herein, Defendants breached their duties owed to the Plaintiffs, causing Plaintiffs and their loved ones to be exposed and/or continue to be exposed to Noxious and Hazardous Substances, including the Visible Deposits.

258. As a direct and proximate result of the Defendants' continuing acts and omissions, and Plaintiffs' resulting exposure to the Noxious and Hazardous Substances released from the Facility, the Plaintiffs have suffered serious emotional distress, the effect of which continues until the present and will persist into the future. Plaintiffs' exposure and the exposure of their family members to Noxious and Hazardous

Substances have placed Plaintiffs and their family members in actual peril, of which Plaintiffs are aware and fearful.

259. As a direct and proximate result of the Defendants' conduct and Plaintiffs' and their family members' exposure to Noxious and Hazardous Substances, the Plaintiffs suffer from fear, anxiety, and apprehension that said exposure is currently threatening their and their family members' health and will contribute to the development of future diseases and/or aggravate existing diseases and/or impairments.

260. Given the well-known and documented effects of the Noxious and Hazardous Substances, the emotional distress, fear, anxiety, anguish, and apprehension that Plaintiffs have suffered and will continue to suffer is reasonable and was reasonably foreseeable to Defendants.

261. The Defendants are jointly and severally liable for all damages, including special and punitive damages, as described herein.

Thirty-Second Claim for Relief - Intentional Infliction of Emotional Distress

262. Each of the allegations contained in the above paragraphs is incorporated by reference as if fully set forth herein.

263. Through the acts and omissions described herein, Defendants intended to cause emotional distress to Plaintiffs and/or acted in a way that they knew or should have known would logically and naturally result in serious emotional distress. The

Defendants' conduct constitutes an unlawful interference with the personal and property rights of the Plaintiffs.

264. The Defendants' conduct, including the release of Noxious and Hazardous Substances, despite knowing that such releases are occurring and knowing the well-documented health effects associated with such releases, was extreme and outrageous, intolerable by a reasonable person, reckless, willful, wanton, and/or negligent; went beyond all bounds of decency; and is intolerable in a civilized community. Defendants' conscious disregard for the rights and safety of Plaintiffs has caused substantial harm to Plaintiffs and their properties and has a great probability of causing further substantial harm.

265. As a direct and proximate result of the Defendants' acts and omissions and the Plaintiffs' exposure to the Noxious and Hazardous Substances released from the Facility, including the Visible Deposits, the Plaintiffs have suffered severe and serious emotional distress, which no reasonable person could be expected to endure, the effect of which continues until the present and will persist into the future. As a direct and proximate result of the Defendants' conduct, the Plaintiffs have suffered and will continue to suffer from psychological injury, including, but not limited to, anguish, anxiety and apprehension over their health and the health of their loved ones who may suffer adverse physical effects from exposure to the Noxious and Hazardous Substances.

266. The Defendants' acts and omissions resulted in serious emotional distress and caused foreseeable and reasonable emotional injury to the Plaintiffs.

267. The Defendants are jointly and severally liable for all damages, including special and punitive damages, as described herein.

RELIEF REQUESTED

WHEREFORE, Plaintiffs respectfully request that the Court issue an order and enter a judgment:

a. Finding that Defendants are jointly and severally liable for all damages, including special and punitive damages;

b. Granting injunctive relief compelling the Defendants (pursuant to a court ordered plan and with participation of the Plaintiffs): (1) to thoroughly and comprehensively investigate, test and assess (or fund an independent environmental investigation with participation by the Plaintiffs) the full nature and extent of the environmental contamination, including soil, sediments, surface water, groundwater, and air, created by Defendants; (2) to fully disclose to the public the full nature and extent of this contamination; and (3) to permanently remediate the areas adversely affected by the release of Noxious and Hazardous Substances;

c. Ordering Defendants to stop the threat of future migration or release of Noxious and Hazardous Substances from the Facility;

d. Requiring the Defendants to fund a community-wide, comprehensive health investigation, health assessment and public health/medical monitoring program for those persons who reside or work in the vicinity of the Facility and who have been exposed to contaminants released by the Facility;

e. Prohibiting the Defendants from maintaining a nuisance and trespass on Plaintiffs' properties, including: (i) requiring independent verification via the continuous monitoring of their Facility to ensure compliance; (ii) appointing a monitor or special master to ensure full compliance; and (iii) requiring further remediation of the harm caused by or contributed by the nuisance and trespass and the negligent acts of the Defendants;

f. Granting Plaintiffs the right and the funding to have expert oversight over all relief granted by the Court;

g. Declaring that Defendants have violated and are violating the CAA and the Ohio SIP, including the CAA's Prevention of Significant Deterioration program requirements, the approved PSD program requirements in the Ohio SIP, and the Ohio Air Nuisance Prohibition in O.A.C. § 3745-15-07;

h. Declaring that Defendants have violated and are violating the Facility's air permits as set forth above;

i. Enjoining Defendants to promptly take all steps necessary to comply with the foregoing laws, regulations, and the Facility's permits;

j. Enjoining Defendants from operating their Facility except in accordance with the CAA, the Ohio SIP, and the Facility's permits;

k. Assessing CAA civil penalties against Defendants;

l. Retaining jurisdiction over this action to ensure compliance with and to oversee implementation of this Court's Order;

m. Awarding Plaintiffs their costs of litigation, including reasonable attorneys' fees; and

n. Granting such other relief as the Court deems just and proper.

JURY DEMAND

Plaintiffs demand a trial by jury for all the issues so triable.

Respectfully submitted,

s/ D. David Altman

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EXHIBIT 3

Updated April 5, 2020

Exposure to air pollution and COVID-19 mortality in the United States

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Abstract

Background: United States government scientists estimate that COVID-19 may kill between 100,000 and 240,000 Americans. The majority of the pre-existing conditions that increase the risk of death for COVID-19 are the same diseases that are affected by long-term exposure to air pollution. We investigate whether long-term average exposure to fine particulate matter ($PM_{2.5}$) increases the risk of COVID-19 deaths in the United States.

Methods: Data was collected for approximately 3,000 counties in the United States (98% of the population) up to April 04, 2020. We fit zero-inflated negative binomial mixed models using county level COVID-19 deaths as the outcome and county level long-term average of $PM_{2.5}$ as the exposure. We adjust by population size, hospital beds, number of individuals tested, weather, and socioeconomic and behavioral variables including, but not limited to obesity and smoking. We include a random intercept by state to account for potential correlation in counties within the same state.

Results: We found that an increase of only 1 $\mu g/m^3$ in $PM_{2.5}$ is associated with a 15% increase in the COVID-19 death rate, 95% confidence interval (CI) (5%, 25%). Results are statistically significant and robust to secondary and sensitivity analyses.

Conclusions: A small increase in long-term exposure to $PM_{2.5}$ leads to a large increase in COVID-19 death rate, with the magnitude of increase 20 times that observed for $PM_{2.5}$ and all-cause mortality. The study results underscore the importance of continuing to enforce existing air pollution regulations to protect human health both during and after the COVID-19 crisis. The data and code are publicly available.

Introduction

The scale of the COVID-19 public health emergency is an unmatched one in our lifetime. It will have grave social and economic consequences. The suddenness and global scope of this pandemic has raised urgent questions that require coordinated and credentialed information to slow its devastation. A critically important public health objective is to identify key modifiable environmental factors, such as ambient air pollution, that could increase the severity of the health outcomes (e.g., ICU hospitalization and death) among individuals with COVID-19.

Our understanding of what causes death in COVID-19 patients is evolving. Early data from China suggests that a majority of COVID-19 deaths occurred in adults aged ≥60 years and among persons with serious underlying health conditions.[1,2] Preliminary analyses of outcomes among COVID-19 patients in the United States largely agree, reporting the highest fatality rates in persons aged ≥65. A report by last month's joint World Health Organization[3] reported that one in seven patients develops difficulty breathing and other severe complications. These patients typically suffer respiratory failure and failure of other vital systems. COVID-19 can cause viral pneumonia with additional extrapulmonary manifestations and complications including acute respiratory distress syndrome (ARDS) which has a mortality rate ranging from 27% to 45%.[4] Factors associated with mortality include sex (male), advanced age (≥65), and the presence of comorbidities including hypertension, diabetes mellitus, cardiovascular diseases, and cerebrovascular diseases. COVID-19 is also associated with a high inflammatory burden that can induce vascular inflammation, myocarditis, and cardiac arrhythmias.[5]

Although the epidemiology of COVID-19 is evolving, we have determined that there is a large overlap between causes of deaths of COVID-19 patients and the diseases that are affected by

long-term exposure to fine particulate matter ($PM_{2.5}$). The Global Burden of Disease Study identified air pollution as a risk factor for total and cardiovascular disease mortality and is believed to be responsible for 5.5 million premature deaths worldwide a year.[6] $PM_{2.5}$ contains microscopic solids or liquid droplets that are so small they can be inhaled and cause serious health problems. On Thursday, March 26, 2020 the US EPA announced a sweeping relaxation of environmental rules in response to the coronavirus pandemic, allowing power plants, factories and other facilities to determine for themselves if they are able to meet legal requirements on reporting air and water pollution.

We hypothesize that because long-term exposure to $PM_{2.5}$ adversely affects the respiratory and cardiovascular system, it can also exacerbate the severity of the COVID-19 infection symptoms and may increase the risk of death in COVID-19 patients. The association between $PM_{2.5}$ and health including pregnancy outcomes, respiratory diseases, cardiovascular diseases, neurocognitive disease in the United States and worldwide is well established.[7,8,9,10,11,12]

A recent study by our group also documented a statistically significant association between long-term exposures to $PM_{2.5}$ and ozone and risk of ARDS among older adults in the United States.[13] Numerous scientific studies reviewed by the US Environmental Protection Agency (US EPA) have linked $PM_{2.5}$ to a variety of health concerns including: premature death in people with heart or lung disease, non-fatal heart attacks, irregular heartbeats, aggravated asthma, decreased lung function, and increased respiratory symptoms such as inflammation, airway irritations, coughing, or difficulty breathing.[14]

Our study includes 3,080 counties in the United States and covering 98% of the United States population. We leverage our previous efforts that focused on estimating the long-term effects of $PM_{2.5}$ on mortality among 60 million United States' Medicare enrollees.[15,16,17] We used a well-

tested research data platform that gathers, harmonizes, and links nationwide air pollution data, census data, and other potential confounding variables with health outcome data. We augment this platform with newly collected COVID-19 data from authoritative data sources.[18] All data sources used in these analyses, along with fully reproducible code, are publicly available to facilitate continued investigation of these relationships as the COVID-19 outbreak evolves and more data become available.

Methods

Table 1 summarizes our data sources and their provenance, including links where the raw data can be extracted directly.

COVID-19 deaths: We obtain COVID-19 death counts for each county in the United States from Johns Hopkins University, Center for Systems Science and Engineering Coronavirus Resource Center.[19] This source provides the most comprehensive county level COVID-19 data to date reported by the US Centers for Disease Control and Prevention and state health departments. This includes real-time number of deaths and number of confirmed cases in each county across the United States. We collect the cumulative number of deaths for each county up to and including April 4, 2020. County level COVID-19 mortality rates are defined for our analyses as the ratio of COVID-19 deaths to county level population size.

Exposure to air pollution: We calculate county level long-term exposure to $PM_{2.5}$ (averaged for 2000 to 2016) from an established exposure prediction models.[20] The $PM_{2.5}$ exposure levels are estimated monthly at 0.01° × 0.01° grid resolution across the entire continental United States by combining satellite, modeled, and monitored $PM_{2.5}$ data in a geographically-weighted regression. These estimates have been extensively cross-validated.[21] We obtained temporally averaged $PM_{2.5}$ values (2000-2016) at the county level by averaging estimated $PM_{2.5}$ values

within a given county. We compute average 2016 $PM_{2.5}$ exposure analogously for each county to use in sensitivity analyses.

Potential Confounders: We consider the following sixteen county level variables and one state level variable as potential confounders: population density, percent of the population ≥65, percent living in poverty, median household income, percent black, percent Hispanic, percent of the adult population with less than a high school education, median house value, percent of owner-occupied housing, population mean BMI (an indicator of obesity), percent ever-smokers, number of hospital beds, and average daily temperature and relative humidity for summer (June-September) and winter (December-February) for each county, and state level number of COVID-19 tests performed. Additional detail on the creation of all variables used in the analysis is available in the Supplementary Materials.

Statistical methods

We fit zero-inflated negative binomial mixed models (ZNB).[22,23,24] using COVID-19 deaths as the outcome and $PM_{2.5}$ as the exposure of interest. The ZNB is composed of two sub-models. The first is a *count sub-model* that estimates the association between COVID-19 deaths and $PM_{2.5}$ (adjusted by covariates) among counties eligible (e.g., confirmed COVID-19 cases) to experience a COVID-19 death. The second is a *zero sub-model* that accounts for the excess of zeros that may be generated by counties not yet eligible for COVID-19 deaths (e.g., due to the absence of confirmed COVID-19 cases) and unlikely to have COVID-19 deaths as of April 4, 2020. Additional modeling details are provided in the Supplementary Materials. We include a population size offset and we adjust for all variables listed above. We also include a random intercept by state to account for potential correlation in counties within the same state, due to similar socio-cultural, behavioral, and healthcare system features and similar COVID-19 response and testing policies. We only report the result from the count sub-model. More

specifically we report exponentiated parameter estimates, the mortality rate ratios (MRR) and 95% CI from the *count sub-model*. The MRR can be interpreted as the relative increase in the COVID-19 death rate associated with a 1 $\mu g/m^3$ increase in long-term average $PM_{2.5}$ exposure among the counties eligible to experience a COVID-19 death. We do not report results from the *zero sub-model*. We carried out all analyses in R statistical software and performed model fitting using the NBZIMM package.[25]

Secondary Analysis

We conduct six secondary analyses to assess the robustness of our results to the confounder set used, potential unmeasured confounders, and outliers.

- First, because New York state has experienced the most severe COVID-19 outbreak in the United States to date and has five times higher COVID-19 deaths than the next highest state, we anticipate that it will strongly influence our analysis. As a result, we repeat the analysis excluding all counties in New York state.
- Second, existing COVID-19 testing and case count data are unable to accurately capture the size of an outbreak in a given county, and the inability to fully adjust for this factor could induce confounding in our analyses (e.g., if counties with high $PM_{2.5}$ exposure also tend to have large outbreaks relative to the population size, then their death rates per unit population could appear differentially elevated, inducing a spurious correlation with $PM_{2.5}$). To explore how this may impact our results, we conduct analyses excluding counties with less than 10 confirmed COVID-19 cases.
- Finally, we fit models omitting the following potential confounders from the model (separately):
    - Number of hospital beds
    - Number of COVID-19 tests performed
    - Population mean BMI and percent smokers (BRFSS)

- Summer and winter temperature and relative humidity (Weather)

Sensitivity analysis

We conduct several sensitivity analyses to assess the robustness of our results to data and modeling choices.

- First, we repeat all the analyses using alternative methods to estimate exposure to $PM_{2.5}$.[26]
- Second, because our study relies on observational data, our results could be sensitive to modeling choices (e.g., distributional assumptions or assumptions of linearity). We evaluate sensitivity to such choices by conducting analyses:
  - Treating $PM_{2.5}$ as a categorical variable (categorized at empirical quintiles)
  - Adjusting for population density as a categorical variable (categorized at empirical quintiles)
  - Using a negative binomial model without accounting for zero-inflation.

Results for the sensitivity analyses are shown in Supplementary Materials.

Results

Our study utilized data from 3,080 counties, of which 2,395 (77.8%) have reported zero COVID-19 deaths at the time of this analysis. **Table 2** describes the data used in our analyses. All COVID-19 death counts are cumulative counts up to April 4, 2020.

Figure 1 visualizes the spatial variation of long-term average exposure to $PM_{2.5}$ and COVID-19 death rates (per 1 million population) by county. Visual inspection suggests that COVID-19 death rates are higher in the Mid-Atlantic, upper Midwest, gulf coast, and west coast regions. These spatial patterns in COVID-19 death rates generally mimic patterns in both high population density and high $PM_{2.5}$ exposure areas. In the Supplementary Materials, we provide additional visualizations and data diagnostics that justify the use of the ZNB model for our analyses. After

removal of counties with missing confounder values, our main analysis was conducted using 1,783 counties. These counties account for 90% of COVID-19 deaths up to April 4, 2020. In **Figure 2** we report the mortality rate ratios (MRR) and 95% CI for our main and secondary analyses. The results of all sensitivity analyses are shown in the Supplementary Materials. In the main analysis, the estimated MRR is 1.15 (1.05, 1.25). That is, we found that an increase of only 1 $\mu g/m^3$ in long-term average $PM_{2.5}$ is associated with a statistically significant increase of 15% in the COVID-19 death rate. This suggests that in New York County (Manhattan) if we were to lower the long-term average $PM_{2.5}$ exposure by only 1 $\mu g/m^3$, we would have expected to see 248 ($= 1905 \times (1 - 1/1.15)$) fewer COVID-19 deaths among a total of 1905 deaths up to April 04, 2020.

In secondary analyses shown in **Figure 2**, we (a) omit number of hospital beds from the adjustment set (b) omit number of tested cases in each state from the adjustment set (c) omit smoking rate and BMI from Behavioral Risk Factor Surveillance System (BRFSS) from the adjustment set (d) omit summer and winter temperature and relative humidity from the adjustment set (e) exclude data from New York state (f) exclude counties with less than 10 confirmed COVID-19 cases. The results of these analyses are consistent with the main analysis, except when the number of hospital beds is omitted from the adjustment set. In that case, the point estimate decreases, and statistical significance is attenuated. This suggests that number of hospital beds is a strong confounder.

Discussion

This is the first nationwide study in the United States that estimates the relationship between long-term exposure to $PM_{2.5}$ and COVID-19 death rates. We found statistically significant evidence that an increase of 1 $\mu g/m^3$ in long-term $PM_{2.5}$ exposure is associated with a 15% increase in the COVID-19 mortality rate. Our results are adjusted for a large set of

socioeconomic, demographic, weather, behavioral, and healthcare-related confounders and demonstrated robustness across a wide range of sensitivity analyses.

In our previous study[27] of 60 million Americans older than 65 years, we found that a of 1 mg/m3 in long-term $PM_{2.5}$ exposure is associated with a 0.73% increase in the rate of all-cause mortality. Therefore, a small increase in long-term exposure to $PM_{2.5}$ leads to a large increase in COVID-19 death rate of a magnitude that is 20 times the one estimated for all-cause mortality.

This analysis provides a timely characterization of the relationship between historical exposure to air pollution COVID-19 deaths in the United States. Research on how modifiable factors may exacerbate COVID-19 symptoms and increase mortality risk is essential to guide policies and behaviors to minimize fatality related to the outbreak. Our analysis relies on up-to-date population-level COVID-19 data and well-validated air pollution exposure measures.[27]

Strengths of this analysis include adjusting for a wide range of potential confounders and a demonstrated robustness of results to different model choices. Moreover, the analyses rely exclusively on data and code that are publicly available. This provides a platform for the scientific community to continue updating and expanding these analyses as the pandemic evolves, and data accumulate.

The inability to accurately quantify the number of COVID-19 cases due to limited testing capacity presents a potential limitation in that we are unable to fully adjust for the size of the outbreak in a given county, which could be a source of unmeasured confounding. We instead adjust by total population size. However, we anticipate that by using a zero-inflated model we provide partial adjustment for this, as we estimate the MRR accounting for the fact that some counties were not eligible to experience a COVID-19 death because they still had zero

confirmed cases. Moreover, the constantly evolving COVID-19 response measures creates a fluid scenario with regards to the availability of medical resources in a given area. The availability of these resources is likely to impact fatality rates. Because real-time, nationwide data on such measures and resources are not available, we are unable to adjust for this feature. As a result, this could represent another source of confounding.

The results of this paper suggest that long-term exposure to air pollution increases vulnerability to experiencing the most severe COVID-19 outcomes. These findings align with the known relationship between $PM_{2.5}$ exposure and many of the cardiovascular and respiratory comorbidities that dramatically increase the risk of death in COVID-19 patients. They are also consistent with findings that air pollution exposure dramatically increased the risk of death during the Severe Acute Respiratory Syndrome (SARS) outbreak in 2003, which is caused by another type of coronavirus.[28] This study provides a motive for expanded follow-up investigations as more and higher quality COVID-19 data become available. These would include validating these results in other data sources and study types and studies of biological mechanisms, impacts of $PM_{2.5}$ exposure timing, and relationships between $PM_{2.5}$ and other COVID-19 outcomes such as hospitalization.

The results of this study also underscore the importance of continuing to enforce existing air pollution regulations during the COVID-19 crisis. Based on our result, we anticipate a failure to do so can potentially increase the COVID-19 death toll and hospitalizations, further burdening our healthcare system and drawing resources away from COVID-19 patients.

Acknowledgments:

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Table 1: Data Sources used in the analysis (all publicly available)

	Source	Data
Outcome: COVID-19 Deaths	Johns Hopkins University the Center for Systems Science and Engineering (CSSE) Coronavirus Resource Center (https://coronavirus.jhu.edu/)	County level COVID-19 death count up to and including April 4, 2020
Exposure: $PM_{2.5}$ concentrations	Atmospheric Composition Analysis Group (http://fizz.phys.dal.ca/~atmos/martin)	0.01° × 0.01° grid resolution $PM_{2.5}$ prediction, averaged across the period 2000-2016 and averaged across grid cells in each county
Confounders	US Census/American Community Survey (https://www.census.gov/programs-surveys/acs/data.html)	County level socioeconomic and demographic variables for 2012-2016 American Community Survey
	US CDC BRFSS (https://www.cdc.gov/brfss/)	County level behavioral risk factor variables for 2011 (most recent year with county-level data available)
	Homeland Infrastructure Foundation-Level Data (HIFLD) (https://hifld-geoplatform.opendata.arcgis.com/datasets/hospitals)	County level number of hospital beds in 2019
	The COVID tracking project (https://covidtracking.com/)	State level number of COVID-19 tests performed up to and including April 4, 2020
	Gridmet via google earth engine https://developers.google.com/earth-engine/datasets/catalog/IDAHO_EPSCOR_GRIDMET)	4km × 4km temperature and relative humidity predictions, summer and winter averaged across the period 2000-2016 and averaged across grid cells in each county.

Table 2: Characteristics for the Study Cohort up to and including April 04, 2020

Variable	Entire Cohort (3080 counties)	Exclude NY State (3018 counties)	Exclude County < 10 Cases (1047 counties)	With HIFLD available (2272 counties)	With BRFSS available (2214 counties)

Number of deaths	7,054	4,662	6,968	6,342	7,024
Number of hospital beds	827,799	770,716	706,051	827,799	811,070
Number of testing (State level)	1,620,460	1,336,839			
$PM_{2.5}$ ($\mu g/m^3$) (SD, standard deviation)	8.4 (2.5)	8.4 (2.5)	9.5 (2.3)	8.5 (2.5)	9.0 (2.3)
County level risk factors characteristics (SD)					
% Ever smoked	47.0 (9.2)	47.0 (9.2)	45.9 (8.0)	46.8 (8.9)	47.0 (9.2)
Mean BMI (kg/m^2)	28.1 (1.3)	28.1 (1.3)	27.9 (1.1)	28.1 (1.3)	28.1 (1.3)
% Below poverty level	10.5 (5.7)	10.6 (5.7)	9.7 (4.7)	10.3 (5.3)	10.3 (5.1)
% Below high school	21.2 (10.5)	21.3 (10.5)	19.5 (8.6)	20.6 (9.8)	21.4 (9.7)

education					
% Owner-occupied housing	74.2 (8.9)	74.2 (8.8)	70.1 (10.3)	74.1 (9.0)	73.4 (9.1)
% Hispanic	7.7 (12.3)	7.7 (12.4)	8.6 (11.3)	7.3 (11.4)	7.5 (11.5)
% Black	8.2 (14.2)	8.3 (14.3)	12.1 (15.4)	8.0 (13.6)	9.2 (13.9)
% older than 65 year-old	15.9 (4.1)	16.0 (4.1)	13.7 (3.6)	15.8 (4.0)	14.9 (3.5)
Population density (persons/mile^2)	446.0 (2121.62)	377.4 (1162.27)	1044.7 (2854.5)	514.1 (2384.8)	608.3 (2479.9)
Median household income (1000 $)	49.0 (13.1)	48.8 (13.0)	54.7 (15.6)	49.6 (12.7)	50.1 (13.6)
Median home value (1000 $)	136.6 (90.5)	135.2 (87.9)	179.8 (114.7)	134.7 (80.4)	148.8 (94.5)

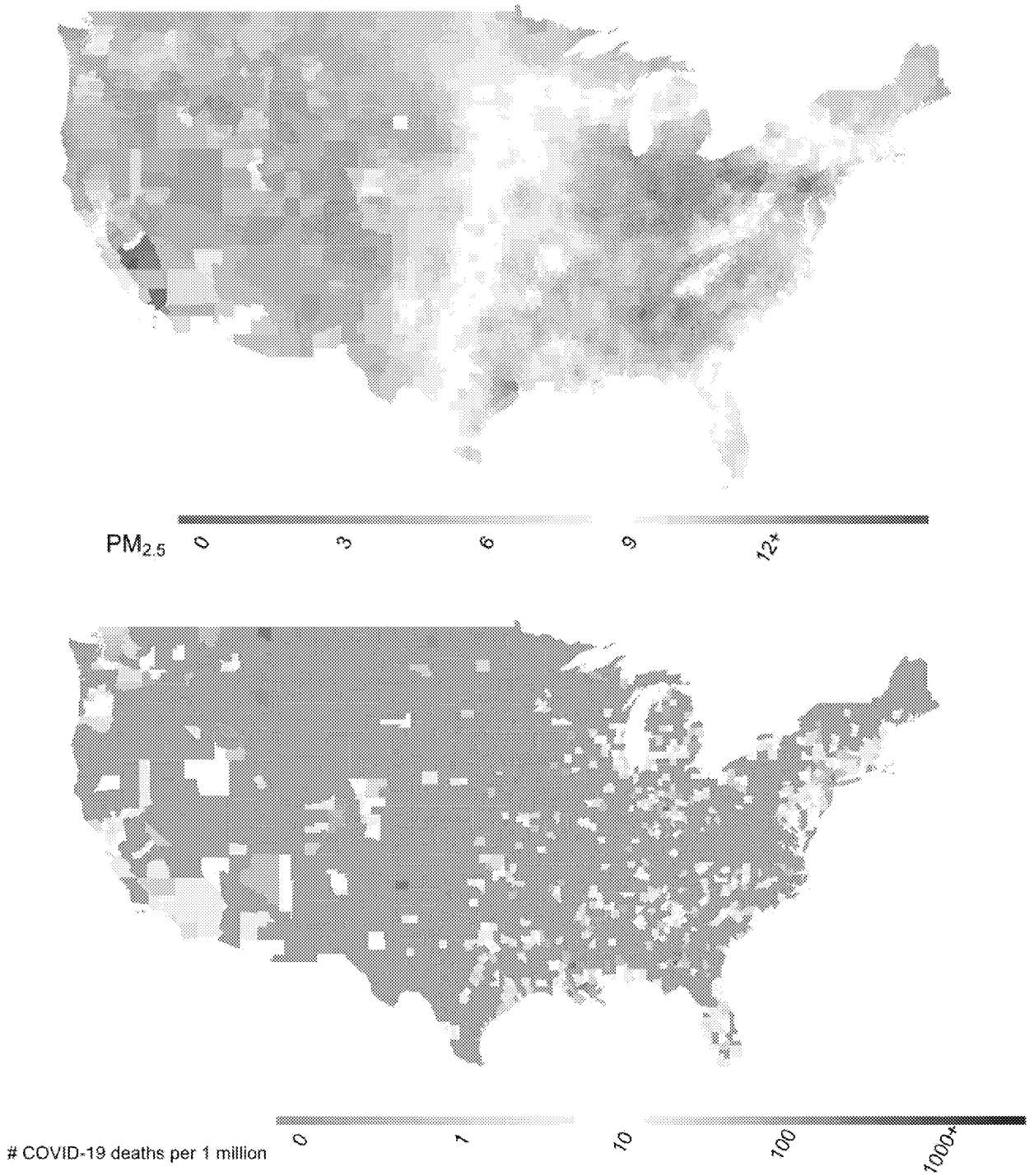

Figure 1: Maps show **(a)** county level 17-year long-term average of $PM_{2.5}$ concentrations (2000-2016) in the US in g/m^3 and **(b)** county level number of COVID-19 deaths per one million population in the US up to and including April 4, 2020.

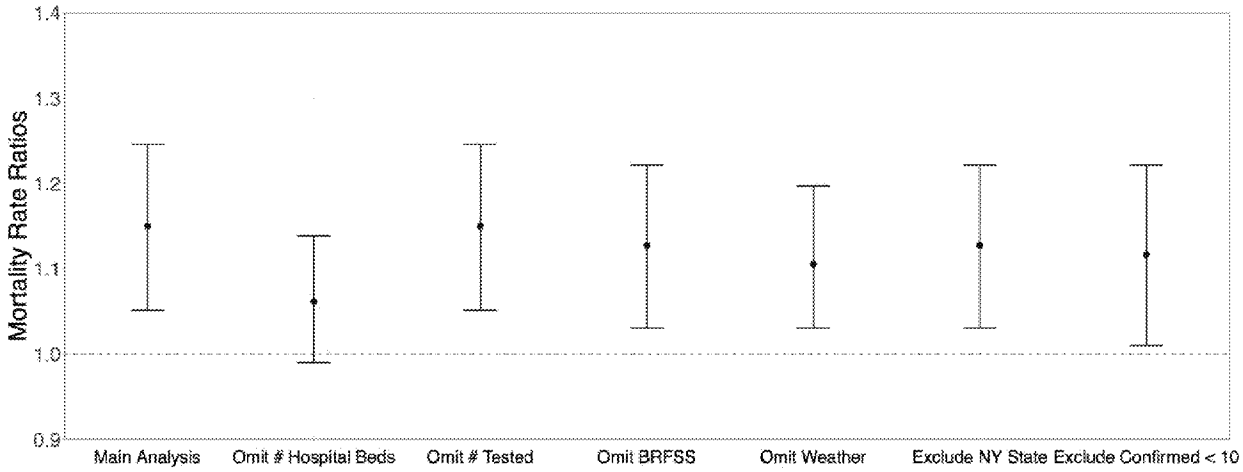

Figure 2: Mortality Risk Ratios (MRR) and 95% confidence intervals. The MRR can be interpreted as percentage increase in the COVID-19 death rate associated with a 1 $\mu g/m^3$ increase in long term average $PM_{2.5}$. The MRR from the main analysis is adjusted by seventeen potential confounders (population density, percent of the population >65, percent living in poverty, median household income, percent black, percent Hispanic, percent of the adult population with less than a high school education, median house value, percent of owner-occupied housing, population mean BMI, percent ever-smokers, summer/winter temperature/relative humidity, and number of hospital beds for each county, and number of COVID-19 tests performed for each state). In secondary analyses, we (a) omit number of hospital beds; (b) omit number of tested cases in each state; (c) omit smoking rate and BMI from BRFSS; (d) omit summer/winter temperature/relative humidity; (e) exclude data from New York state; (f) exclude data from counties with less than 10 confirmed cases. All COVID-19 death counts are cumulative counts up to and including April 04, 2020.

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EXHIBIT 4

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Policy Research Working Paper 9221

Incidence of COVID-19 and Connections with Air Pollution Exposure

Evidence from the Netherlands

Bo Pieter Johannes Andrée

WORLD BANK GROUP
Fragility, Conflict and Violence Global Theme
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Abstract

The fast spread of severe acute respiratory syndrome coronavirus 2 has resulted in the emergence of several hot-spots around the world. Several of these are located in areas associated with high levels of air pollution. This study investigates the relationship between exposure to particulate matter and COVID-19 incidence in 355 municipalities in the Netherlands. The results show that atmospheric particulate matter with diameter less than 2.5 is a highly significant predictor of the number of confirmed COVID-19 cases and related hospital admissions. The estimates suggest that expected COVID-19 cases increase by nearly 100 percent when pollution concentrations increase by 20 percent. The association between air pollution and case incidence is robust in the presence of data on health-related preconditions, proxies for symptom severity, and demographic control variables. The results are obtained with ground-measurements and satellite-derived measures of atmospheric particulate matter as well as COVID-19 data from alternative dates. The findings call for further investigation into the association between air pollution and SARS-CoV-2 infection risk. If particulate matter plays a significant role in COVID-19 incidence, it has strong implications for the mitigation strategies required to prevent spreading.

This paper is a product of the Fragility, Conflict and Violence Global Theme. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at http://www.worldbank.org/prwp. The author may be contacted at bandree@worldbank.org.

The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

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Incidence of COVID-19 and Connections with Air Pollution Exposure: Evidence from the Netherlands

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Highlights

Background: Research on viral respiratory infections has found that infection risks increase following exposure to high concentrations of particulate matter. Several hot-spots of Severe Acute Respiratory Syndrome Coronavirus 2 infections are in areas associated with high levels of air pollution.

Approach: This study investigates the relationship between exposure to particulate matter and COVID-19 incidence in 355 municipalities in the Netherlands using data on confirmed cases and hospital admissions coded by residence, along with local $PM_{2.5}$, PM_{10}, population density, demographics and health-related pre-conditions. The analysis utilizes different regression specifications that allow for spatial dependence, nonlinearity, alternative error distributions and outlier treatment.

Results: $PM_{2.5}$ is a highly significant predictor of the number of confirmed COVID-19 cases and related hospital admissions. Taking the WHO guideline of 10mcg/m3 as a baseline, the estimates suggest that expected COVID-19 cases increase by nearly 100% when pollution concentrations increase by 20%.

Conclusion: The findings call for further investigation into the association between air pollution on SARS-CoV-2 infection risk. If particulate matter plays a significant role in the incidence of COVID-19 disease, it has strong implications for the mitigation strategies required to prevent spreading, particularly in areas that have high levels of pollution.

Keywords: COVID-19, SARS-CoV-2, Coronavirus, Air Pollution, Particulate Matter.

JEL Codes: O13, F64, Q51, Q52, Q53

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1. Introduction

In 2019, confirmed infections with a new novel human coronavirus (SARS-CoV-2) emerged in Wuhan, in the Hubei Province in China. The virus rapidly spread to other parts of China and by early 2020 it had emerged in many other countries around the world. The World Health Organization (WHO) declared a global pandemic on March 11 2020, as confirmed cases topped 118,000 in more than 110 countries and territories around the world with sustained community spread.

Epidemiologists have started to investigate possible environmental factors that accelerate the spread of SARS-CoV-2 within communities (Sajadi et al., 2020; Bhattacharjee, 2020). A recent paper by van Doremalen et al. (2020) analyzed the aerosol and surface stability of SARS-CoV-2 and compared it with SARS-CoV-1, the most closely related human coronavirus (Wu et al., 2020a). The study found that SARS-CoV-2 can survive up to three days on some surfaces, like plastic and steel, and that aerosol transmission is plausible since the virus can remain viable and infectious in the air for hours. These findings echo those of Chen et al. (2004) on environmental contamination with SARS-CoV-1, and are consistent with evidence for aerosol distribution of SARS-CoV-2 found by Guo et al. (2020), but are inconsistent with the current WHO stance that SARS-CoV-2 is not transported by air. However, the possibility of airborne transmission would call for different mitigation efforts to prevent spreading and is thus an important area of study.

The risk of infection of some airborne viruses has been shown to increase in the presence of ambient fine particles that can stay in the air for long periods, travel far distances, and penetrate deeply into lungs.[1] One highly contagious airborne disease is caused by the measles virus. Previous studies on disease outbreaks have highlighted that the incidence of measles in China increased 1-3 days after short-term exposure to high concentrations of PM_{10} and SO_2 Chen et al. (2017b); Peng et al. (2020). In another study, ambient fine particles were found to contribute to the relative risk of influenza transmission in Chinese cities (Chen et al., 2017a) with the most significant effect occurring within a period of 2-3 days.

If air pollution plays a similar role in the incidence of SARS-CoV-2, there should be a positive relationship between confirmed COVID-19 cases and particulate matter concentrations. China ranks among the worst globally in terms of $PM_{2.5}$ concentrations and, within China, the Hubei province is among the more heavily polluted areas (van Donkelaar et al., 2016). The most heavily hit Italian region is the Lombardy area in the northern Po valley, which is among the regions with the worst air quality in Europe. Preliminary findings from Italian researchers started pointing towards a correlation between days of exceeding the limits for PM_{10} and the number of hospital admissions from COVID-19 (Setti et al., 2020; Onufrio, 2020).

Increased air pollution could just reflect the presence of anthropogenic activity which instead explains the patterns. However, that does not explain why COVID-19 cases are not increasing rapidly in every densely populated area.

1. Over the years, numerous studies have related hospitalization numbers, case numbers, and relative risk of respiratory viral infections and influenza-like illnesses to short-term air pollution exposure, mostly at city level, using a variety of data sets and methods. See (Ciencewicki and Jaspers, 2007) for an early review, see (Xu et al., 2013; Liang et al., 2014; Su et al., 2019) on influenza-like illnesses, and (Silva et al., 2014; Huang et al., 2016; Feng et al., 2016; Li et al., 2018) on viral respiratory infections.

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To investigate this further, the current paper looks at confirmed cases and COVID-19 related hospital admissions in 355 municipalities in the Netherlands and uses regression techniques to investigate correlations between COVID-19 case data and particulate matter concentrations, controlling for a variety of demographic characteristics and data on health related pre-conditions. The analysis finds that $PM_{2.5}$ is a highly significant predictor of both the number of confirmed COVID-19 cases and the number of related hospital admissions per 100,000 inhabitants.

The analysis suggests that the association between air pollution and case incidence is robust to proxies for worse respiratory health and symptom severity. The findings are also robust to other important control variables and different regression specifications that allow for spatial dependence, nonlinearity, alternative error distributions and outlier treatment. Results are obtained with ground-measurements and satellite-derived $PM_{2.5}$. Analyzing COVID-19 data from alternative dates resulted in similar conclusions.

The remainder of this paper is organized as follows. Section 2 visually inspects several available confirmed case maps and discusses the spatial distribution. Section 3 introduces the data used for analysis. Section 4 presents regression results and discusses several of the estimates. Section 5 concludes.

2. Spatial Distribution of COVID-19: Country Examples

Suggestive evidence that the spatial distribution of COVID-19 cases is not purely random and might be related to environmental factors can be found by exploring several maps of confirmed cases. A few easily accessible fine resolution maps are presented below, in particular for the Netherlands, Germany, Spain and Italy. The data for the Netherlands is taken from the Dutch National Institute for Public Health and Environment (RIVM).[2] The data for Germany is from the Robert Koch Institute.[3] The data for Italy can be viewed via a live dashboard,[4] and the raw data is well organized and available on a github page.[5] The Spanish data was taken from this link.[6]

A number of features of the spatial distributions are striking. First, there is a strong spatial correlation visible in all four countries, which is to be expected for a virus that spreads by human contact. It is intriguing, however, that the highest case density in the Netherlands is in Brabant, the southeastern part of the country, while major cities like Amsterdam and Rotterdam are in the west part of the country where the case density is lower. While Brabant is not the most populous province, it accounts for the highest contribution to nation-wide industrial GDP. Within the province, the sub-region Zuidoost-Noord-Brabant produces the highest contribution to industrial GDP.[7] This area approximately spans the COVID-19 case cluster that can be seen on the map.

2. https://www.rivm.nl/coronavirus-kaart-van-nederland-per-gemeente
3. https://experience.arcgis.com/experience/478220a4c454480e823b17327b2bf1d4
4. http://opendatadpc.maps.arcgis.com/apps/opsdashboard/index.html#/b0c68bce2cce478eaac82fe38d4138b1
5. https://github.com/pcm-dpc/COVID-19/tree/master/dati-province
6. https://www.rtve.es/noticias/20200323/mapa-del-coronavirus-espana/2004681.shtml
7. https://www.cbs.nl/nl-nl/nieuws/2018/31/belang-industrie-voor-de-regio

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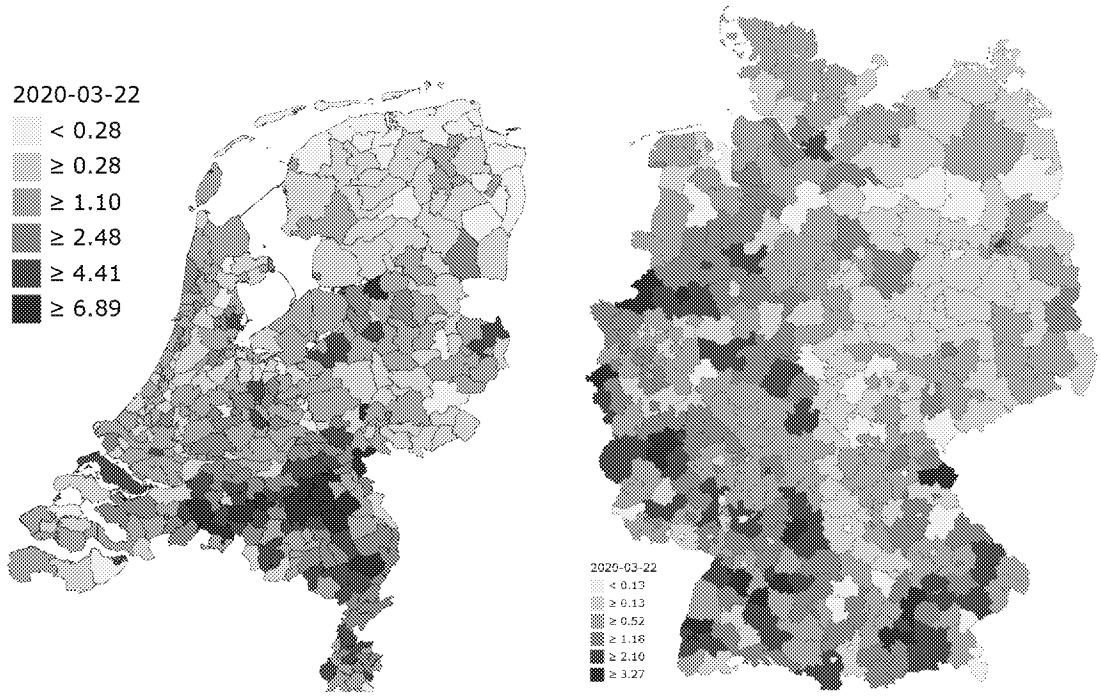

Figure 1: Distribution of COVID-19 in the Netherlands and Germany. Confirmed cases per 10,000 inhabitants.

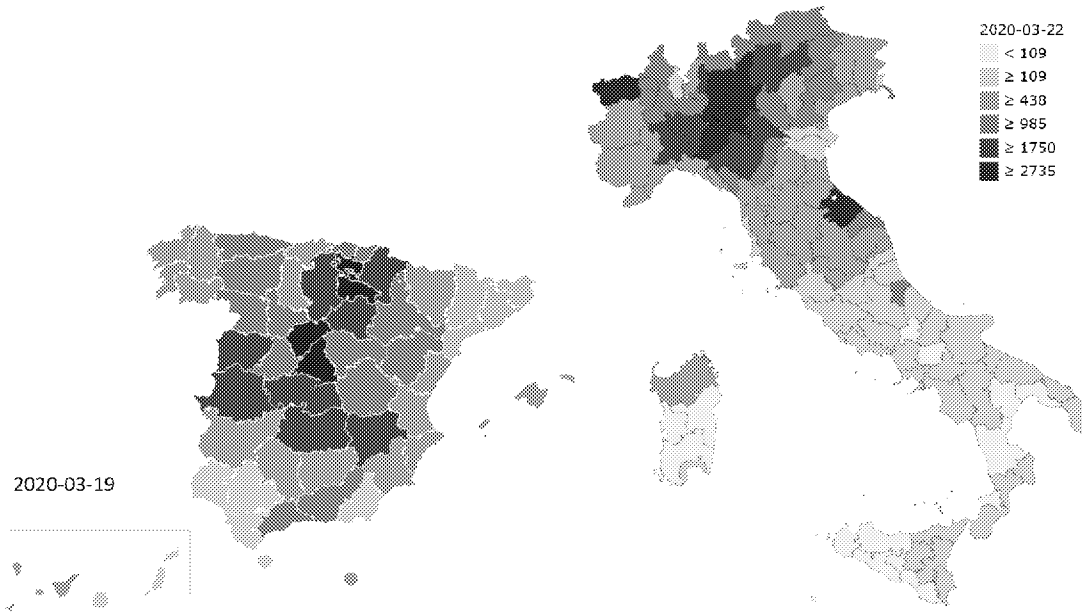

Figure 2: Distribution of COVID-19 in Spain and Italy. Confirmed cases per 1,000,000 inhabitants.

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In Germany, two areas stand out. First, the western part of the country, near the border with the Netherlands, Belgium, and Luxembourg, has an increased case density. This area (North Rhine-Westphalia, Rheinland-Pfalz and Baden-Württemberg) contains the major industrial regions including the Ruhr area. Second, a cluster of cases can be seen in the south-eastern part of the country near Munich where major automobile industry is found. These areas are also the most populous of the country, which makes it difficult to draw any immediate conclusions about a relationship with air quality.

In Spain, confirmed cases have the highest case density in the capital, Madrid, with an extension into neighboring Sergovia. A second cluster can be also seen northeast of Madrid. Interestingly, Spain's population density is high along the eastern coast where the case density is lower. This suggests that case incidence in the country does not simply follow population densities, but that other factors play a role.

Finally, in Italy, confirmed cases have the highest case density in the northern part of the country, Lombardy in particular. Without a doubt, Lombardy and the Po valley as a whole has one of the highest concentrations of air pollutants of Europe. Moreover, the case density does not seem to trend strongly with Italy's population distribution. For example, Italy's population density is generally high along its coast, and cities like Rome and Naples do not stand out in the map.

Taken together, the maps suggest that that COVID-19 incidence clusters spatially and that environmental factors beyond population density may play a role. The analysis in the remainder of the paper confronts the relatively granular Dutch case data with possible predictors that include population density, air pollution, demographic characteristics and health related controls.

3. Data

The COVID-19 data is taken from the RIVM.[8] The first data snapshot includes all confirmed cases as of March 22 (a total of 4,004 with known residence out of 4,157 confirmed cases). A second snapshot of confirmed cases was taken on March 30 and includes 11,258 cases with known residence out of 11,750 confirmed cases. The confirmed COVID-19 hospital admissions are taken from the same source approximately 1 week after the first data snapshot (31 March, a total of 4,562 with known residence out of 4,712 admissions from a total of 12,595 confirmed cases). While some cases are reported immediately, a share of the cases follows a typical delay of up to 1-2 days after the actual case or hospitalization confirmation. Both the confirmed cases, as well as confirmed hospital admissions, are coded by residence (not by hospital addresses).

On March 31, approximately 37% of confirmed cases were also hospital admissions, highlighting that case detection is likely biased toward more severe cases.[9] Within one week, the number of hospital admissions exceeded the confirmed cases of the previous week, indicating that the time between confirmation and hospitalization likely spans only a few days. Cases are reported to the RIVM by the Municipal Health Service (GGD).The GGD is organized as collaboration between municipalities to provide base level public health service

8. https://www.rivm.nl/coronavirus-kaart-van-nederland-per-gemeente
9. For example, early estimates based on Chinese cases indicated that the hospitalization rate of elderly, the most vulnerable population, was only 18.4% (Verity et al. 2020).

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in accordance with country-level legislation on public health. The 355 municipalities are grouped into 25 GGD areas, each covering a population of approximately 600,000 inhabitants. The GGD borders are visible in figure 5 which visualizes the hospital admissions.

The data is combined with demographic statistics (2019) obtained from the Dutch Central Bureau of Statistics.[10] The data contains the official population headcount at district level, as well as a number of relevant household characteristics. A number of surveyed health statistics (2016) have been obtained as well from the RIVM (maps can be viewed in the source link).[11] The data is based on a survey of 457,000 people and includes the share of population in each district with a documented long-term illness (illnesses over 6 months), the prevalence of overweight and obesity, alcohol abuse, smoking and noise due to traffic. Hence the data controls for the presence of possible pre-conditions that make certain populations more vulnerable.

A variety of air pollution data sets exist. For the main analysis, annual average particulate matter concentrations from the RIVM are used to capture long-term exposure (2017, published September 2019).[12] The data is used by the government for official monitoring in accordance with EU guidelines on air quality monitoring and has a resolution of 25 meter grids. These high-resolution grids are produced by spatial interpolation of ground-measurements. For this analysis, the grids have been averaged to the municipality level. The spatial distribution of pollution has remained relatively stable in recent years. The intensity of air pollution has gradually gone down since 2013, though the difference between the 2017 and 2015 data is relatively small. This suggests that the spatial variation of the 2017 data is still relevant to analyze the role of long-term pollution exposure in the current situation. The temporal lag in the pollution data also ensures that there is no endogeneity due to feedback between case incidence and changes in pollution levels that follow lock-down policies.

To test whether the main findings of the analysis generalize to other pollution data sets, a second analysis presented in the appendix uses the coarser grids from the global $PM_{2.5}$ data set of van Donkelaar et al. (2016). The main conclusions of the analysis do not change when this alternative pollution data set is used, and since this data is mainly satellite-derived, it may be used in other countries where detailed $PM_{2.5}$ measurements are not easily available. Figure 6 visualizes the spatial distribution of the main $PM_{2.5}$ and PM_{10} statistics. Table 3 summarizes the full set of covariates used in the analysis.

4. Results

The analysis is organized into two main investigations and a set of robustness analyses. First, section 4.1 analyzes the confirmed cases per 100,000 inhabitants using linear models that account for possible spatial autocorrelation and residual dependence. Section 4.2 analyzes the data nonlinearly, allowing parameter estimates to vary across locations and levels in the data. Additional results are included in the appendix, section 6.2. In particular, the robustness of the results is diagnosed by using alternative measures of incidence, a different source of pollution data, and alternative distributional assumptions.

10. https://www.cbs.nl/nl-nl/dossier/nederland-regionaal/geografische-data/wijk-en-buurtkaart-2019
11. https://www.rivm.nl/media/smap/langdurigeziekte.html
12. https://www.atlasleefomgeving.nl/kaarten

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4.1 Linear analysis of March 22 cases per 100,000 inhabitants

To analyze the relationship between spatial variation in particulate matter concentrations and COVID-19 incidence, a number of regressions are estimated that control for possible spatial autocorrelation (Anselin, 1988).[13] Importantly, the spread of SARS-CoV-2 manifests itself in hot-spots that result from contact with infective subjects from areas that are in close proximity, and it can show strong geographical patterns that are not structurally related to air pollution levels. The fact that the infection started at different times in different areas together with the exponential and geographical nature of case spread, may lead to spurious associations between the spatial distribution of case hot-spots and pollution levels, particularly if the initial cases occurred in polluted regions by mere chance and then spread to nearby regions.[14]

To account for the issue, spatial models include neighboring values of the dependent variable and/or residuals as additional variables. These spatial averages control for the clustering that results from geographical spillovers.[15] These models can be understood as spatial equivalents to the models that are commonly used to analyze time series in which observed values are in part explained by recent observations. While the household composition and population density terms capture more dense social links, the spatial regression components capture the likelihood of contact with infective subjects. In particular, within a hot-spot, neighboring areas have high numbers of cases per 100,000 inhabitants, and the spatial regression terms capture the increased likelihood of having contact with infective subjects within the region. The important empirical question that these models thus seek to answer is whether pollution and case incidence are associated after controlling for the geographical relationships in disease spread.

First, Model 1 estimates a linear regression using all 22 covariates and possible confounders of interest that are summarized in table 3. These include population density, gender, age groups, marital status and household composition, the share of migrants, as well as several population health indicators. Particularly the health indicators are important because $PM_{2.5}$ is known to affect population health. This may result in important pre-conditions that lead to more severe COVID-19 disease. Pre-conditions captured by the data include the share of population with a long-term illness (including asthma), the share of people that smoke and admit to guidelines on alcohol use, the share of people diagnosed with obesity or overweight, as well as variables on populations exposed to traffic noise.

13. The treatment of spatial autocorrelation and spatial residual correlation took a firm position in quantitative geography after the contributions by Cliff and Ord (1969, 1972). Spatial econometrics as a subfield of econometrics was rapidly developed as a means to analyze sub-country data in regional econometric models (Anselin, 2010). Good introductory books exist, apart from the one referenced in the main text (LeSage and Pace, 2009) is one other. The (Q)MLE is worked out, for example, in (Lee, 2004). The field is still actively developed, with recent advances focusing on time series dynamics and non-linearity (Beenstock and Felsenstein, 2019; Andrée, 2020).
14. The first case was detected on February 27 in Loon op Zand in Brabant, but that same night a case was also confirmed in Amsterdam. Within 4 days, 10 cases had been confirmed in 6 cities across 4 provinces with multiple sources of infection, it took till March 23 for lockdown policies to be announced, giving ample time for spread from multiple points, see https://nos.nl/artikel/2325309-beatrixziekenhuis-gorinchem-gesloten-om-coronavirus-tien-patienten-in-nl.html
15. While the spatial autoregressive models only include the rate of infective subjects in neighboring areas as regressors, the models in fact allow for feedback and spillovers to more distant observations as each area is also a second-order neighbor of itself. See the literature on spatial models cited earlier.

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It is well known that models with a high number of variables can over-fit data sets that contain only a modest number of observations. Model 2 estimates the same linear regression but uses step-wise variable selection following the AIC, Model 3 uses the selected variables in a spatial error model that controls for spatial dependence in the residuals (λ parameter), Model 4 estimates a spatial autoregressive model that allows for dependence on neighboring observations (ρ parameter), Model 5 allows for unique spatial autocorrelation and spatial residual correlation parameters. For compactness, table 1 only lists Model 1 estimates for variables selected by the AIC, even though all regressors are included. Finally, PM_{10} correlates (.95) strongly with $PM_{2.5}$ and the AIC favored $PM_{2.5}$. Replacing it with PM_{10} in the regressions below led to a small deterioration in measures of fit, indicating that $PM_{2.5}$ is a statistically preferred predictor, although the main conclusions do not depend on this. For simplicity, the focus remains on the $PM_{2.5}$ data.

Table 1: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants.

Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 5b**
(Intercept)	-359.58	-402.51***	-202.58***	-200.63***	-207.50***	-185.43***
	(218.20)	(80.61)	(76.06)	(64.11)	(74.59)	(71.75)
Population density	-6.28**	-6.54***	-0.03	-1.10	-0.48	-0.48
	(2.58)	(2.38)	(2.05)	(1.87)	(2.06)	(1.94)
Share 25 to 44	3.55	2.62*	-0.80	0.47	-0.37	-.41
	(2.17)	(1.34)	(1.05)	(1.05)	(1.07)	(1.02)
Share above 65	5.58*	4.22***	2.12**	2.14*	2.08**	1.07*
	(2.26)	(1.27)	(1.03)	(1.00)	(1.05)	(1.00)
Share unmarried	4.94***	4.78***	4.01***	3.28***	3.83***	3.59***
	(1.33)	(0.97)	(0.96)	(0.78)	(0.94)	(0.89)
Share single household	-4.02***	-2.17***	-1.62***	-1.50***	-1.59***	-1.70***
	(1.47)	(0.57)	(0.49)	(0.45)	(0.49)	(0.46)
Share non-western immigrants	-1.32**	-1.23**	-0.57	-0.78**	-0.77*	-0.58
	(0.57)	(0.48)	(0.43)	(0.38)	(0.42)	(0.40)
Share of water surface	17.58	16.11	11.30	13.56*	13.53	11.53*
	(11.18)	(10.28)	(9.62)	(8.07)	(9.21)	(8.71)
Share with long-term illness	1.10	1.19	0.41	0.72	0.64	0.97
	(1.00)	(0.76)	(0.92)	(0.60)	(0.79)	(0.74)
Case severity						-0.065***
						(.01)
Mean $PM_{2.5}$	10.17**	10.84***	6.21***	3.52***	4.91**	4.47***
	(4.66)	(1.48)	(2.82)	(1.22)	(2.44)	(2.31)
λ			0.71***		0.42*	0.39
			(0.26)		(0.26)	(0.25)
ρ				0.68***	0.43	0.50**
				(0.25)	(0.25)	(0.21)
R2	0.24	0.22	0.52	0.51	0.50	0.55
AICc	3414.85	3391.40	3274.36	3274.12	3269.31	3237.91

Standard Errors in parenthesis, significance levels as: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

In the non-spatial regressions, the correlation with population density is negative and significant, suggesting that the case density is on average lower in densely populated areas. This could reflect mis-specified scaling. However, in the models that control for spatial clustering, population density is not significant. This suggests that, after controlling for spatial clustering, the spatial variation in case density is not related to population density patterns. Instead, the share of unmarried and the share of single households, which relate to the number of households in a given population and the type of social networks that they

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have, are significant regressors. The estimates suggest that instead of the total number of people a person can have contact with within an area (population density), infection risk is determined by the number of people a person is likely to interact with (determined by marital status and household type), together with the average share of infected inhabitants in the wider region (spatial components). This is a plausible result. To simplify the multi-dimensional relationship between case densities and social interaction, regressing single household shares on unmarried population shares shows that on average, a 1% increase in the first is associated with a 0.74 % increase in the latter, suggesting that on average the case densities increase when there are more households in an area.

Importantly, across all regression specifications, the coefficient for $PM_{2.5}$ is positive and highly significant in the presence of controls, and also in the specifications that control for spatial residual trends and the rate of infective subjects in nearby areas. Combined, the regressions thus provide strong evidence that $PM_{2.5}$ plays a role in COVID-19 case incidence that cannot be attributed to demographics or health pre-conditions. In particular, the estimate of 10.84 in Model (2) suggests that, on average, cases per 100,000 inhabitants grow by approximately $21.68 \sim 22$ when concentrations increase from 10mcg/m3 to 12mcg/m3. This corresponds to slightly less than a 100% increase given that the average municipal case density in the data is $24.79 \sim 25$ per 100,000 inhabitants. Note that the direct elasticity is lower in the spatial models (3-5), but the net impacts need to be multiplied by spatial spillover effects. Spatial spillovers ρ and spatial correlation in the residuals λ are both significant and have a positive sign highlighting that spatial spillovers further add to local effects. For example, evaluating the prediction difference of the spatial autoregressive model (4) at $PM_{2.5}$ levels of 10mcg/m3 and 12mcg/m3, suggests a very similar increase in case incidence of $22.08 \sim 22$ per equal number of inhabitants.

Across the regression specifications, it is found that the health indicators have no significant linear relationship with confirmed case incidence. Only the share of population with a long-term illness was kept in the model with the lowest AIC, but its effect is not significant in any of the regression specifications. Going from Model 1 to Model 2, it can be seen that the parameter estimate for $PM_{2.5}$ varies little after dropping the majority of health data controls, suggesting that the association between case incidence and pollution is not heavily impacted by adding or removing available data on possible pre-conditions. It is however important to ensure that the association between case incidence and pollution concentrations is not in fact driven by worse respiratory health in polluted areas. If worse respiratory health and aggravated symptoms in polluted areas are the main channels of action, higher COVID-19 case hospitalization rates should also be expected in these locations. For this reason, the percentage of the confirmed cases that resulted in hospital admission one week later (March 22 cases / March 31 hospital admissions times 100) was calculated as proxy for case severity. In 29 areas with no confirmed cases where hospitalizations occurred within a week, a value of 100 is assigned. In 9 areas where none of the confirmed cases resulted in hospitalization, a value of 0 is assigned.[16] Model 5b adds this additional proxy

16. The proxy is not perfect due to the low data density. Using instead the percentage of March 30 cases that resulted in March 31 hospitalization leads to only 4 replacements of both types (100/0). Re-estimating Model 5b with this recalculated proxy did not result in measurable change relative to Model 5. Using instead the March 30 confirmed cases as dependent variable in the same regression specification did not find the severity proxy to be significant and found $PM_{2.5}$ to remain significant at the highest level.

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variable and finds that it is highly significant. The overall model fit improves as indicated by the AICc and R2. The estimate for $PM_{2.5}$ remains relatively unchanged and significant. While one would expect that case severity contributes to higher cases, as increased symptom severity may lead to higher case detection, the result suggests otherwise. One explanation is that high hospital admission occurred in areas with a weak case detection policy. In particular, if the disease goes unnoticed for long, the number of terminally ill patients can grow because they do not receive appropriate treatment in time. In this case, low case numbers can coincide with high hospital admission numbers. To investigate further whether the proxy captures a valuable signal related to symptom severity, appendix section 6.2.5 provides additional results that try to explain the case severity proxy using the other available predictors. These additional results find that age, male gender, and the share of population with overweight are positively associated with increased case hospitalization rates. This is in line with earlier identified risk groups (Ruan, 2020), suggesting that the proxy does capture a relevant case severity signal.

Taken together, the evidence suggests a significant positive relationship between case density and $PM_{2.5}$ concentrations. However, there are still some limitations to the basic regression results presented here. The standard linear regression model may not be perfectly suitable for modeling the number of cases per 100,000 inhabitants due to the non-negative nature of the data and a right skew in the case density distribution. Strong violations of the correct-specification assumption can result in biased estimates, for instance because the models assess linearity on an additive scale while the phenomenon is multiplicative. Instead of assessing the data on the original scale as a multiplicative error model with a changing variance function, this issue is often addressed by rewriting the model as an additive error model on the log-scale with constant variance. This is appropriate as long as the log transformation is appropriate to normalize the data. To assess whether the simple estimations presented here are prone to a strong bias, section 6.2.2 investigates the residual distribution and re-analyzes the data using a log-type power transformation from a family of functions that allows for zeros. The results highlight that when the data is appropriately scaled and multiple diagnostics confirm that the Normality assumption is in fact valid, $PM_{2.5}$ is still a highly significant positive predictor of case densities. Earlier studies on the role of ambient fine particles in the transmission risk of airborne disease have instead relied on Poisson-type regressions using count data. While these regressions are not entirely appropriate as they do not account for the highly significant geographical relationships in the data, section 6.2.1 presents Poisson-type results that allow for over-dispersion to show that the main conclusions are also robust to this specification choice.

4.2 Nonlinear analysis of March 22 cases per 100,000 inhabitants

Instead of working on a transformed scale to address some of the highlighted issues, it is also possible to tackle the problem nonlinearly on the original scale. This might also lead to interesting results on important thresholds in the data. In particular, one might expect particulate matter to only contribute to COVID-19 incidence after concentrations surpass a certain critical threshold, or expect pollution dependencies to vary with unobserved weather variables including humidity and temperature (Chen et al., 2017b,a; Peng et al., 2020). In a recent study, Sajadi et al. (2020) have already shown that there could be a relationship

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between COVID-19 incidence and climatic conditions. Some COVID-19 related climatic zones are mapped by the Copernicus Earth Observation Programme, see (Copernicus Climate Change Service, 2020), and these put all but a select few municipalities analyzed in this study in the same zone. For this reason, one should expect that if the relationship between pollution and COVID-19 incidence varies regionally, it does so with a reasonable smoothness.

Additional results below are obtained using non-parametric penalized kernel regression following (Hainmueller and Hazlett, 2014; Andrée et al., 2019). The estimates provide observation-level marginal coefficients that allow for nonlinearity conditional on levels in the data. Longitude and latitude have been added as additional controls, which allows the model to capture spatial trends in line with a spatial residual component. However, this time it also allows the model's parameters to vary across spatial gradients in unobserved components, such as related to weather. The model nests a linear model, specifically, higher levels of regularization result in linearized relationships. Evidence that the relationship with air pollution is nonlinear is strengthened by using Model (2) and re-estimating it after applying a third-order Taylor approximation to the $PM_{2.5}$ measurements. Calculating an auxiliary test statistic for the significance of the second and third terms overwhelmingly supports nonlinearity, a Likelihood Ratio obtains a p-value below 0.001 (statistic of 15.18 on 2 degrees of freedom).

The fit of the nonparametric model is tuned using standard cross-validation procedures and out-of-sample prediction performance was estimated using 10-fold, repeated twice, cross-validation. To keep the flexibility of the models at a manageable level given the small number of observations, only a few predictors are used. In particular, the significant predictors from the final model (5) are taken, the share of unmarried is dropped as the model can now estimate nonlinear dependence on the share of single households, the share of long-term illness and population density are added back in because they remain of particular interest. The share of non-Western immigrants was dropped because it was insignificant and dropping it did not negatively impact the cross-validation results. Finally, the share of population in the 25 to 44 years group was dropped because estimating nonlinearly on only the share of population above 65 resulted in better fit.

Table 2: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants.

Variable	**Avg.**	**Pr(|Avg.| > 0)**	**q.25**	**q.50**	**q.75**
Population density	-3.75	0.24	-8.40	-1.84	1.62
Share above 65	-0.41	0.44	-1.55	0.00	1.42
Share of single households	-1.57	0.00	-2.56	-1.01	0.19
Share with long-term illness	0.39	0.59	-1.70	-0.06	1.94
Mean $PM_{2.5}$	5.98	0.02	-1.24	3.16	11.45

Insample R2: 0.50, CV R2 0.35, Longitude and Latitude used as additional controls.

Table 2 presents the estimation results. In it, Avg. takes the average across all the marginal coefficients and q.25-q.75 give the quantiles as an indication of parameter heterogeneity. To understand the shape of the nonlinearity, figure 3 plots conditional expectations across the range of values in the covariates. The values are produced by fixing all covariates,

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except the one of interest, at mean values, and plotting the model predictions and their standard errors across the .025th percentile to the .975th percentile values of inputs.

The averages of parameter estimates resemble the results from those obtained with linear regression methods. In particular, the average slope of population density is again negative but not significant, while the increased share of single households provides a stronger signal for increased case densities, particularly in the inner range of values that have denser data coverage (see figure 3). The age group control shows that elderly are more at risk. The estimated relationship with the share of population that has a long-term illness highlights an important threshold. Fewer COVID-19 cases are expected only in areas with very low values for this indicator.

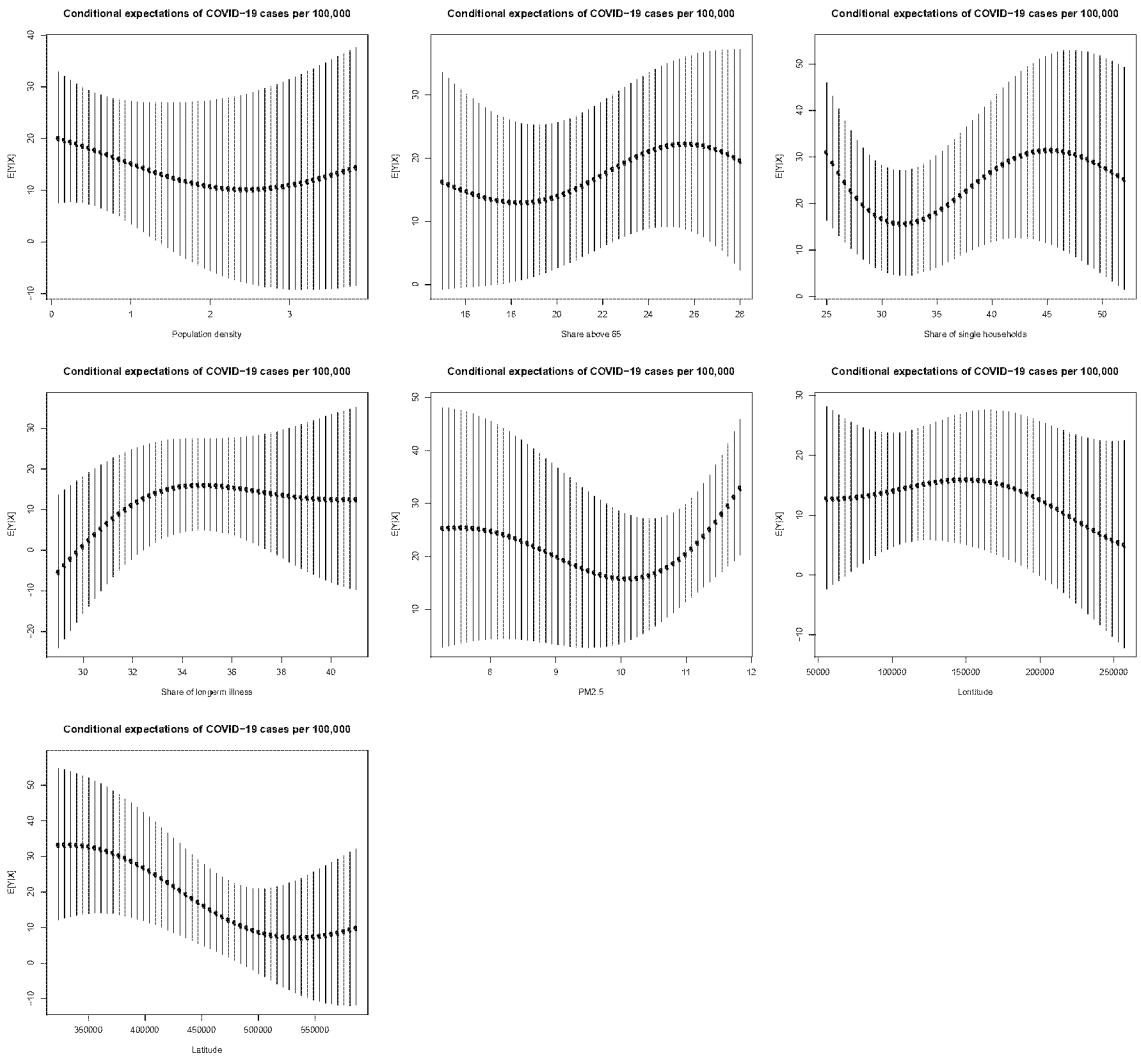

Figure 3: Conditional expectation plots for COVID-19 cases per 100,000 inhabitants.

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Importantly, after addressing nonlinearity and spatial heterogeneity in parameter estimates, the average slope of $PM_{2.5}$ remains positive and highly significant. The ranges in the quantiles highlight that there is substantial parameter heterogeneity. The nonlinear estimates suggest that at low levels of $PM_{2.5}$, changes in particulate matter concentrations are not associated with significant changes in case incidence. However, after the mean annual concentrations cross the WHO guidelines of 10mcg/m3, the standard errors tighten and the number of expected cases increases sharply. At 12mcg/m3, the expected cases per 100,000 inhabitants are approximately double the numbers expected at 10mcg/m3.

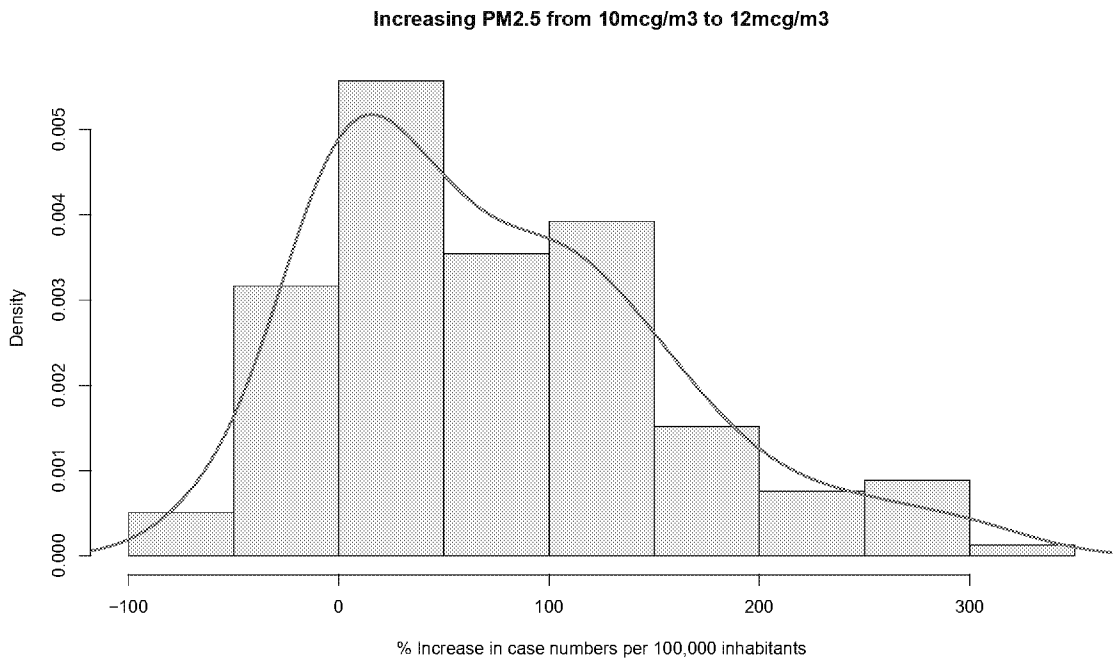

Figure 4: Prediction difference when increasing pollution concentrations (N=158).

More indication of impacts is approximated by calculating the prediction difference when $PM_{2.5}$ moves from 10mcg/m3 to 12mcg/m3, leaving all other covariates at observed values. This is performed for all areas that have at least already 9mcg/m3 and case numbers within the 25% to 75% quantile range (between 8.3 and 31.7 cases per 100,000). The prediction difference is standardized based on the current actual case numbers and multiplied by 100, thus expressed as a percentage increase with respect to current case numbers. The results in figure 4 highlight the effect heterogeneity, suggesting that the modeled pollution association varies strongly depending on other covariates. Numerical integration under the kernel density suggests 80% of events result in positive increases in case incidence, and of these events the estimated average increase in cases per 100,000 inhabitants is 95% when particulate matter concentrations increase from 10mcg/m3 to 12mcg/m3.

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5. Conclusion

Research on viral respiratory infections, measles and influenza outbreaks has found that infection risks increase following exposure to high concentrations of particulate matter. This paper investigated the relationship between COVID-19 incidence and exposure to particulate matter in 355 municipalities in the Netherlands. Regression analysis was performed using confirmed cases per 100,000 inhabitants, confirmed COVID-19 related hospital admissions per 100,000 inhabitants, and confirmed case counts as dependent variables.

The study finds that $PM_{2.5}$ is a highly significant predictor of all three indicators of COVID-19 incidence. The findings are robust to outlier treatment and power transforms to normalize data, and are stable across alternative regression specifications that allow for spatial dependence or nonlinearity, and remain significant in the presence of demographic and health controls. Estimates suggest that when annual concentrations cross above the WHO guidelines of 10mcg/m3, the number of expected cases per 100,000 inhabitants doubles as annual concentrations reach 12mcg/m3 all else constant.

While the analysis found that these results are robust to various methodological considerations, it is important to note that testing for SARS-CoV-2 is performed using convenience sampling, which may well vary by area and in time. This may induce biases in the results if the sampling rate is indirectly correlated with pollution levels. However, it is difficult to perceive why sampling should structurally be related to pollution concentrations. Moreover, in light of the rich body of literature on the association between pollution exposure and respiratory tract infection risk, and the plausible parameter estimates with respect to many of the other variables, convenience sampling does not seem to be a more plausible explanation for the results than the findings of the study itself. Moreover, another new study by Wu et al. (2020b) has found evidence for a higher number of confirmed fatal COVID-19 cases per 100,000 inhabitants in the United States, which seems to corroborate the findings on increased hospital admissions and cases per 100,000 inhabitants.

The findings call for further investigation. In particular, the air pollution link should be investigated in multiple countries and for wider ranges of $PM_{2.5}$ concentrations. If the relationship extrapolates to higher concentrations, the implications for developing countries may be severe. In particular, developing countries are highly polluted compared to the levels observed in this study (Andrée et al., 2019) and are already identified as risk areas for COVID-19 spread (Gilbert et al., 2020; Nkengasong and Mankoula, 2020; Martinez-Alvarez et al., 2020). Even though this study was not able to find strong evidence for an impact of $PM_{2.5}$ on case severity, at the high levels of $PM_{2.5}$ in developing countries, more severe impacts on respiratory health may interact with case fatality of SARS-CoV-2. The possible association between pollution and symptom severity will thus be important to revisit, particularly because regional variation in case fatality of closely related SARS-CoV-1 has been associated with air pollution exposure (Cui et al., 2003).

Finally, as more data on COVID-19 spread becomes available, stronger results on the specific effects of short-term air pollution exposure may be estimated. If fine particulate matter plays a significant role in SARS-CoV-2 infection risk, it has strong implications for the mitigation strategies required to prevent spreading.

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6. Appendix

6.1 Data descriptives

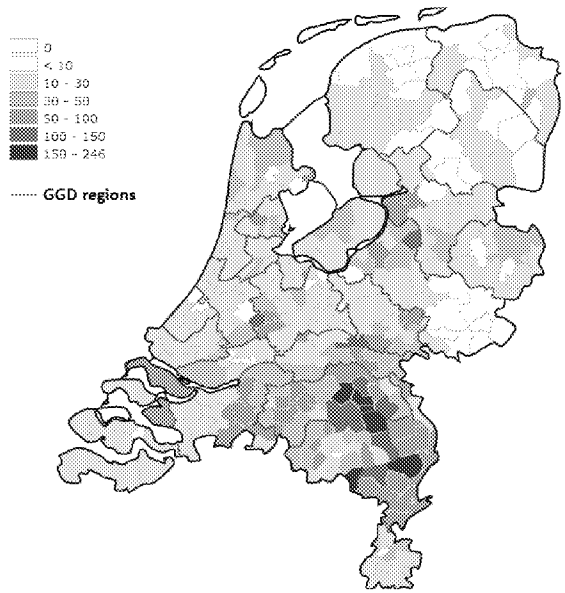

Figure 5: Hospital admissions per 100,000 inhabitants on March 31.

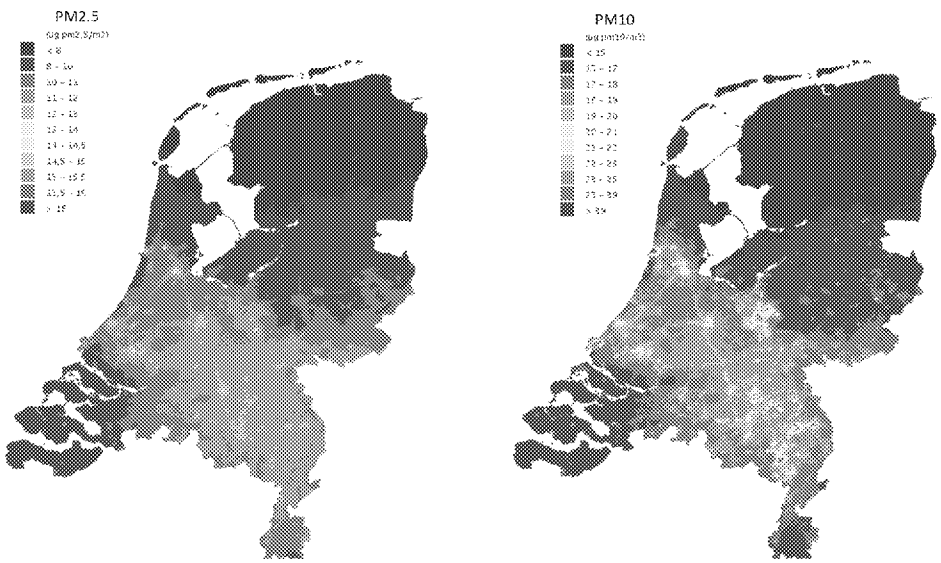

Figure 6: Particulate matter concentrations (2017).

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Table 3: Data descriptives.

Variable	mean	sd	median	min	max
March 22 confirmed cases per 100,000	24.79	31.62	16.00	0.00	349.50
March 30 confirmed cases per 100,000	70.84	63.77	54.20	0.00	565.70
March 31 hospital admissions per 100,000	29.36	30.81	20.50	0.00	237.20
March 22 confirmed case counts	11.41	21.66	6.00	0.00	188.00
March 22 case hospitalization rate	141.15	102.67	107.05	0.00	804.92
March 30 case hospitalization rate	41.39	19.23	41.05	0.00	100.00
Population density (thousands per sqkm)	0.88	1.04	0.46	0.02	6.52
Share of male population	0.51	0.01	0.50	0.47	0.57
Share from 14 to 24	11.72	1.65	12.00	9.00	23.00
Share from 25 to 44	21.96	2.84	22.00	14.00	36.00
Share from 45 to 64	29.32	2.22	30.00	19.00	34.00
Share above 65	21.24	3.29	21.00	9.00	32.00
Share of unmarried	44.53	4.19	44.00	37.00	65.00
Share of single households	32.76	6.32	31.00	20.00	60.00
Share of households without children	32.02	3.56	32.00	20.00	40.00
Average household size	2.26	0.18	2.30	1.70	3.30
Share of western immigrants	8.61	4.46	8.00	2.00	47.00
Share of non-western immigrants	7.43	5.93	5.00	1.00	39.00
Share of water surface	0.11	0.17	0.04	0.00	0.94
Share with long-term illness	34.11	2.91	34.00	27.00	45.00
Share of overweight	51.01	3.68	51.00	37.00	61.00
Share exposed to noise above 50kmh	3.03	1.38	3.00	0.00	8.00
Share exposed to noise below 50kmh	4.84	2.00	5.00	1.00	13.00
Share with obesity	14.46	2.17	14.00	9.00	22.00
Share of non-heavy drinkers	39.94	4.87	40.00	30.00	58.00
Share of smokers	19.64	2.72	19.00	14.00	31.00
Mean $PM_{2.5}$	10.22	1.33	10.69	6.95	12.04
Mean PM_{10}	17.28	1.61	17.74	13.60	21.09
Mean Van Donkelaar $PM_{2.5}$	14.60	1.77	15.01	10.15	18.05

6.2 Additional analysis results

This section presents a number of additional estimations. In particular, section 6.2.1 presents Poisson-type regressions that use case counts as dependent variables in line with earlier studies on the relationship between air pollution and viral spread, the influence of possible outlier observations or the discussed distributional issues is investigated in section 6.2.2 in section 6.2.3 the main analysis is re-estimated using confirmed cases from March 30 to show that the conclusions are not dependent on the date of the case snapshot, the main analysis is also repeated using confirmed hospital admissions from March 31 in section 6.2.4 to provide further evidence that the conclusions are not dependent on measurement error in the confirmed cases. Section 6.2.5 investigates correlations between covariates and the case hospitalization rates used to proxy for symptom severity. Finally, additional analysis in section 6.2.6 re-estimates the main analysis using alternative satellite-derived $PM2_{2.5}$.

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6.2.1 POISSON-TYPE REGRESSIONS FOR CASE INCIDENCE

In table 4, the case counts are used in regression instead of case density. Model 8 estimates a standard Poisson regression. Model 9 estimates a Poisson regression with stepwise selection following the AIC. Model 10 presents the same model, allowing for over-dispersion. Finally, Model 11 allows for a zero-inflated Negative Binomial distribution and model 12 performs step-wise AIC under the Negative Binomial.

Table 4: Dependent Variable: Confirmed COVID-19 cases.

Variable	**Model 8**	**Model 9**	**Model 10**	**Model 11**	**Model 12**
(Intercept)	-13.75***	-13.75***	-13.75***	-9.89**	-4.14
	(2.23)	(1.64)	(5.12)	(4.86)	(2.72)
Population density	-0.35***	-0.35***	-0.35***	-0.30***	-0.29***
	(0.02)	(0.02)	(0.08)	(0.08)	(0.07)
Share of male population	-22.38***	-23.12***	-23.12***	-16.07***	-13.29***
	(1.90)	(1.85)	(5.77)	(4.96)	(4.41)
Share 14 to 24	0.07***	0.07***	0.07	0.04	
	(0.02)	(0.01)	(0.04)	(0.05)	
Share 25 to 44	0.16***	0.16***	0.16***	0.17***	0.15***
	(0.02)	(0.02)	(0.05)	(0.05)	(0.04)
Share above 65	0.13***	0.13***	0.13**	0.09*	0.05*
	(0.02)	(0.02)	(0.05)	(0.05)	(0.03)
Share of unmarried	0.14***	0.14***	0.14***	0.11***	0.10***
	(0.01)	(0.01)	(0.04)	(0.04)	(0.02)
Share of household without children	0.06***	0.06***	0.06	0.04	
	(0.02)	(0.01)	(0.04)	(0.04)	
Average household size	2.75***	2.58***	2.58***	1.04	
	(0.44)	(0.25)	(0.77)	(0.68)	
Share of western immigrants	0.03***	0.03***	0.03	0.00	
	(0.01)	(0.01)	(0.02)	(0.02)	
Share of non-western immigrants	0.03***	0.03***	0.03**	0.02	
	(0.00)	(0.00)	(0.01)	(0.02)	
Share enduring noise above 50km	0.03*	0.04***	0.04	0.01	
	(0.02)	(0.01)	(0.04)	(0.04)	
Share of obese	0.06**	0.05***	0.05	-0.03	
	(0.02)	(0.02)	(0.05)	(0.04)	
Share of non-drinkers	-0.05***	-0.05***	-0.05**	0.00	
	(0.01)	(0.01)	(0.02)	(0.01)	
Share of smokers	0.11***	0.12***	0.12***	0.06	
	(0.01)	(0.01)	(0.04)	(0.04)	
Mean $PM_{2.5}$	0.52***	0.47***	0.47***	0.45***	0.44***
	(0.05)	(0.02)	(0.06)	(0.05)	(0.04)
R2	0.59	0.59	0.59	0.47	0.47
AICc	3995.20	3983.77	3983.77	2242.19	2227.05

Standard Errors in parenthesis, significance levels as: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

The residuals are checked for spatial autocorrelation, and significant residual clustering was still found. Spatial autocorrelation is not easily addressed in count data with standard regression implementations, hence the results are simply from a mis-specified model. For this reason, the models that relax distributional assumptions (10-12) should provide improved indications of significance, with Model 10 being proffered. The main results of the paper presented in section 4 take spatial processes explicitly into account and are in turn preferred over Model 12.

A few results using the count data echo the main findings. In particular, the slope of population density is negative, indicating that the more populous areas in the Netherlands

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are more likely to have lower case numbers on average rather than higher. Several of the health indicators are significant, but only in the standard Poisson regression. Allowing for over-dispersion or estimating under the Negative Binomial distribution finds no significant relationship suggesting that these relationships are less robust. In all specifications, the impact of $PM_{2.5}$ remains highly stable and significant. This provides further evidence that confirmed COVID-19 cases are higher in polluted areas and that these conclusions do not dependent on using count or Normal estimation techniques.

6.2.2 Distributional mis-specification and outlier analysis

Since only a modest amount of observations has been used in the analysis, it is important to diagnose whether the estimation result could be heavily impacted by outlier observations. One way to diagnose this is to inspect a Q-Q plot, which compares the standardized residuals to theoretical quantities from the Normal distribution.

Figure 7 highlights that the Normality assumption is not entirely satisfied. Both Model 2 and Model 5 residuals contain outliers, particularly in the right tail of the distribution. In both models, the residuals follow a very similar pattern and the three major outliers that are prevalent on both specifications are Boekel, Uden and Bernheze which are all in the COVID-19 cluster in the province of Brabant. Outliers can be influential in a regression, though they do not necessarily have to be, while other points that lie within a normal range of the model can be influential without being an outlier per se. The impact of outlier observations depends also on the data density in the region around the data point. The Q-Q plots do not inform about whether the identified outlier observations are actually influential in the regression. Figure 8 calculates Cook's distance, a multivariate measure of influence, and identifies influential data points by evaluating the impact of individual observations on the regression results with respect to the covariates of interest through a leave-one-out procedure.

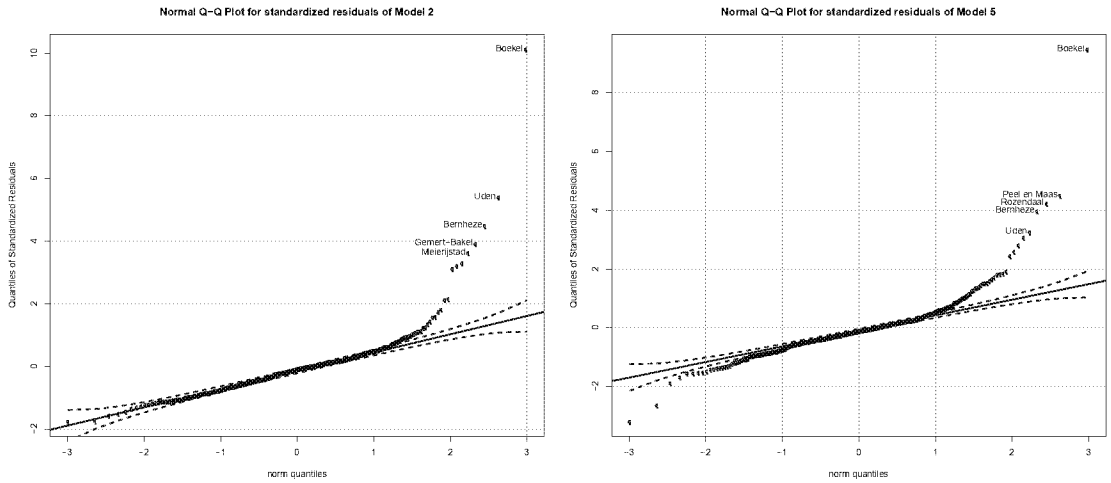

Figure 7: Comparison of residuals to theoretical quantities.

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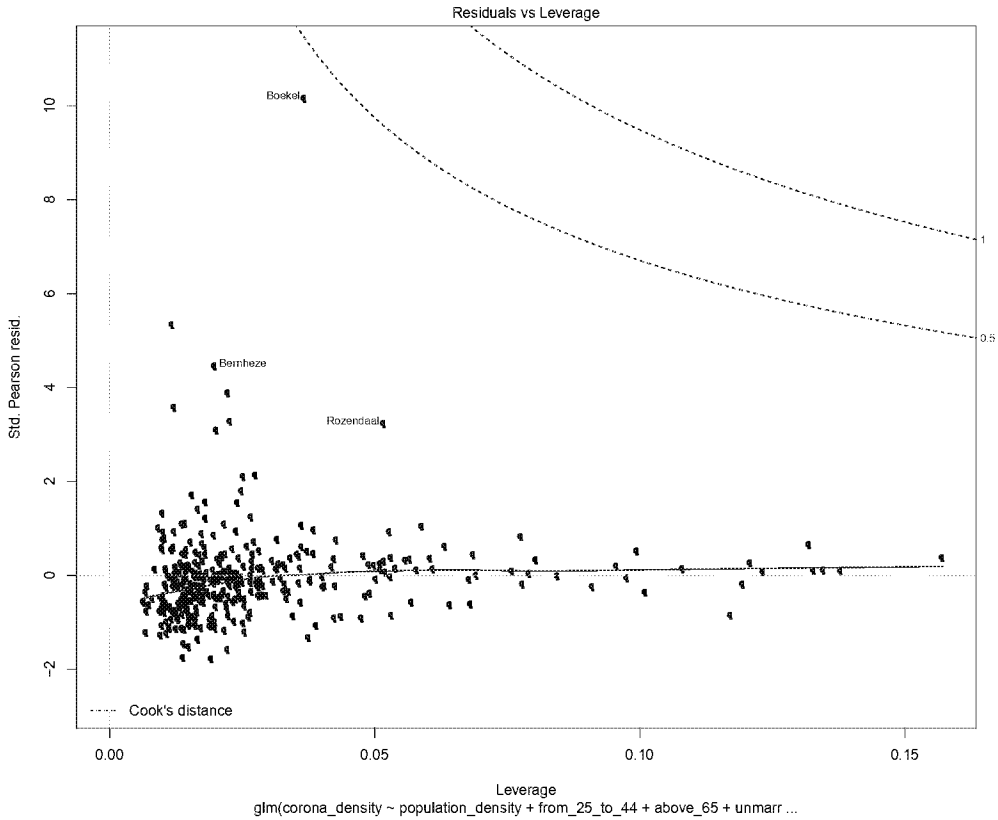

Figure 8: Residuals versus Leverage plot using Cook's distance.

Figure 8 highlights that Boekel and Bernheze are relatively influential, but not critically. This is reassuring, nevertheless it is important due to the small sample nature of the applications to evaluate whether the identified mild violations have a drastic impact on the estimation results. Two regressions are performed to analyze this. First, Model 5c replaces the dependent values of the 8 observations that have visibly the largest residuals in the Q-Q plot with predicted values from Model 5 and re-estimates the specification. This allows comparing directly how the parameter estimates change when these outlier observations are replaced with values that lie closer to the normal range of the data. It is important to note that if these observations are not outliers in an additive sense, but simply reflect the nature of the data-generating process, then these new estimates have in fact an increased bias resulting from further mis-specification. To evaluate whether outliers can be addressed through model-specification, Model 5d first normalizes the data using a power transformation (Johnson) by finding the transformation that minimizes the p-value of a Shapiro test for Normality, and then re-estimates Model 5's specification on the more Gaussian data. These parameter values cannot be directly compared to the parameter values of Model 5 because the new relationship is nonlinear (logarithmic-type). Nevertheless, Model 5d informs whether the significance of relationships remains intact when the Normality violations are neutralized.

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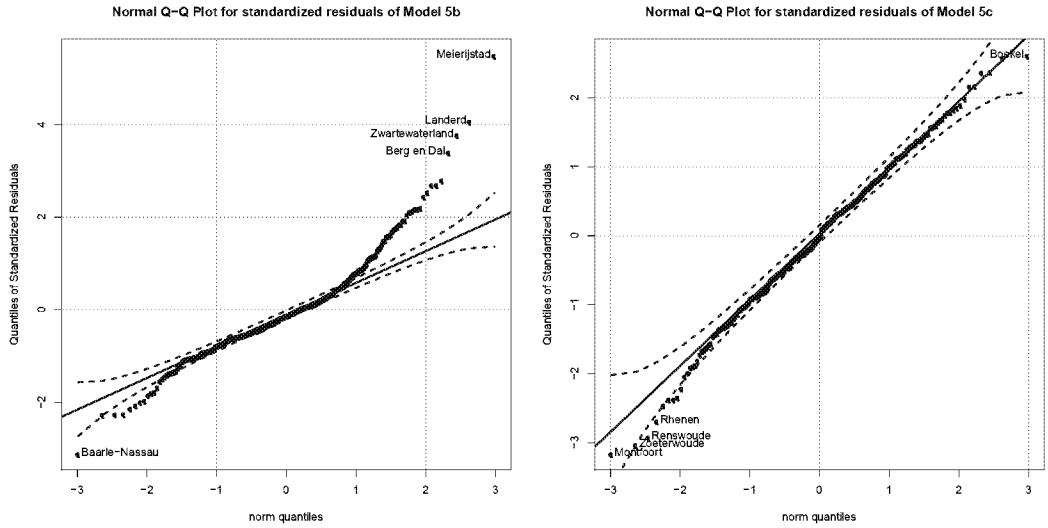

Figure 9: Comparison of residuals to theoretical quantities.

Table 5: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants.

Variable	**Model 5c**	**Model 5d**
(Intercept)	-91.40**	-10.75***
	(43.93)	(2.41)
Population density	-0.83	-0.16**
	(1.27)	(0.07)
Share from 25 to 44	-0.16	0.05
	(0.73)	(0.04)
Share above 65	0.67	0.10**
	(0.68)	(0.04)
Share of unmarried	1.61***	0.10***
	(0.52)	(0.03)
Share of single households	-0.56*	-0.05***
	(0.30)	(0.02)
Share of non-western immigrants	-0.55**	-0.02
	(0.25)	(0.01)
Share of water surface	9.33*	0.68**
	(5.31)	(0.31)
Share with long-term illness	0.29	0.01
	(0.37)	(0.02)
Mean $PM_{2.5}$	2.67***	0.45***
	(0.89)	(0.04)
λ	-0.22	-0.05
	(0.16)	(0.19)
ρ	0.73	-0.06
	(0.07)	(0.17)
R2	0.54	0.31

Standard Errors in parenthesis, significance levels as: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

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Inspecting the new Q-Q plots in figure 9 highlights that Model 5c is still prone to distributional mis-specification. This also suggests that the outliers whose values are now replaced with values closer to the normal range of the data are not necessarily outliers in an additive sense, but simply reflect the exponential nature of the data. From that regard, Model 5d is preferred, as it applies a suitable exponential transformation that clearly neutralizes any outlier or non-Gaussian behavior. In both models, the relationship with $PM_{2.5}$ remains significant and positive hence the conclusion is that the main findings of the analysis are not sensitive to outliers.

6.2.3 Re-estimation using March 30 confirmed cases per 100,000 inhabitants

Model 5e, in table 6 below, re-estimates the step-wise AIC regression and then uses the covariates in the same specification as Model 5 using confirmed cases from March 30. This is to evaluate whether the relationship with $PM2_{2.5}$ is robust to using data from a different date. The correlation between confirmed cases per 100,000 inhabitants on March 22 and March 30 is approximately .90. It is clear from the estimation results that using the newer data does not alter the main conclusions. In particular, similar covariates are preferred by the AIC and the parameter estimate for $PM_{2.5}$ increased in value and remains significant at the highest level.

Table 6: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants using March 30 cases.

Variable	**Model 5e**
(Intercept)	-374.01***
	119.87
Population density	-2.28
	(3.54)
Share from 25 to 44	3.12
	(1.99)
Share above 65	4.79***
	(1.89)
Share of unmarried	5.03***
	(1.45)
Share of single households	-2.72***
	(0.83)
Share of non-western immigrants	-1.70**
	(0.70)
Share with long-term illness	1.14
	(1.04)
Mean $PM_{2.5}$	6.39***
	2.42
λ	-0.11
	0.16
ρ	0.71
	0.08
R2	0.56
AICc	3736.24

Standard Errors in parenthesis, significance levels as: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

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6.2.4 Re-estimation using March 31 confirmed hospital admissions per 100,000 inhabitants

Model 5f in table 7 below, re-estimates Model 2 then uses the covariates in the same specification as Model 5 using confirmed hospital admissions from March 31. This is to evaluate whether the relationship with $PM_{2.5}$ is robust to possible measurement error in the confirmed cases. The correlation between confirmed cases per 100,000 inhabitants on March 22 and March 31 hospital admissions is approximately .80, the correlation using March 30 confirmed cases is .88. It is clear from the estimation results that using confirmed admissions instead of cases does not alter the main conclusions. In particular, the parameter estimate for $PM_{2.5}$ remains highly significant.

Table 7: Dependent Variable: Confirmed COVID-19 hospital admissions per 100,000 inhabitants.

Variable	**Model 5f**
(Intercept)	-256.68***
	(82.20)
Population density	-2.48
	(1.82)
Share from 14 to 24	1.55
	(1.24)
Share from 25 to 44	2.25*
	(1.20)
Share from 45 to 64	0.40
	(0.84)
Share above 65	3.18***
	(1.15)
Share of unmarried	2.63***
	(0.74)
Share of single households	-1.90***
	(0.48)
Share of non-western immigrants	-0.47
	(0.36)
Share of water surface	14.89**
	(7.49)
Share with long-term illness	0.88
	(0.55)
Mean $PM_{2.5}$	3.74***
	(1.33)
λ	-0.10
	(0.17)
ρ	0.68***
	(0.09)
R2	0.54
AICc	3242.22

Standard Errors in parenthesis, significance levels as: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

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6.2.5 Linear analysis of case hospitalization rates

The main results provided evidence for increased COVID-19 incidence in areas where populations are more exposed to air pollution. However, it is possible that the estimated association between $PM_{2.5}$ concentrations and COVID-19 incidence can be attributed to worse respiratory health in polluted areas, which then leads to more severe symptoms and higher case detection. The analysis tried to control for this using health data and the percentage of confirmed cases that resulted in hospitalization as controls. This did not impact the results. A second way to further test this theory is by analyzing the association between $PM_{2.5}$ and the case hospitalization rate because worse respiratory health would lead to more severe COVID-19 disease (Ruan, 2020). The suspect correlation is investigated below using step-wise AIC variable selection keeping $PM_{2.5}$ in the variable set, followed by the full spatial specification. Model 6 uses March 31 confirmed COVID-19 hospital admissions as a percentage of March 22 confirmed COVID-19 cases, model 7 uses March 30 confirmed cases. The analysis finds that age, male gender, and the share of population with overweight are positively associated with increased case hospitalization rates which follows earlier identified risk groups (Ruan, 2020).

Table 8: Dependent Variable: Confirmed COVID-19 related hospital admissions as a percentage of COVID-19 cases.

Variable	**Model 6**	**Model 7**
(Intercept)	-587.36*	-93.71***
	(296.95)	(35.24)
Population density		-2.08*
		(1.26)
Share of male population	935.03**	
	(487.40)	
Share 45 to 64	9.17***	1.05*
	(3.82)	(0.51)
Share of unmarried		0.57*
		(0.33)
Share of households without children	-7.74***	
	(2.58)	
Average household size		7.70
		(5.51)
Share of western immigrants	-1.83	
	(1.96)	
Share of non-western immigrants		0.46*
		(0.25)
Share of water surface		14.25**
		(5.62)
Share of overweight	8.74***	0.57**
	(1.92)	(0.25)
Share exposed to noise above 50kmh	-10.16**	
	(4.22)	
Mean $PM_{2.5}$	-6.70	0.40
	7.79	0.63
λ	0.46*	-0.40**
	0.13	0.17
ρ	-0.60***	0.61***
	0.16	0.10
R2	0.20	0.26
AICc	3938.38	3019.20
N	355	355

Standard Errors in parenthesis, significance levels as: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

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6.2.6 Re-estimation using satellite-derived $PM_{2.5}$

This section evaluates whether the relationship with $PM_{2.5}$ generalizes to measurements from a different source. Table 9 compares the municipality-level data. Both measurements trend in the same direction but the levels according to the RIVM are roughly one-third below those of van Donkelaar.

Table 9: Comparison of $PM_{2.5}$ statistics: RIVM 2017 vs van Donkelaar 2016.

Variable	**Mean**	**Min**	**q.25**	**q.50**	**q.75**	**Max**
RIVM 2017	10.22	6.95	9.43	10.69	11.23	12.04
van Donkelaar 2016	14.60	10.15	13.44	15.01	16.01	18.05

Correlation: 0.70

Model 5g in table 10 estimates step-wise AIC with the new pollution data and uses the selected covariates in the specification of Model 5. Model 5h uses the same controls as Model 5, and Model 5i applies the Yeo-Johnson power transform. The analysis makes use of the confirmed cases from March 22. It is clear from the estimation results that the use of satellite-derived $PM_{2.5}$ results in similar conclusions. The parameter estimate for $PM_{2.5}$ remains significant in the presence of controls and is significant at the highest level when the dependent variable is first normalized.

Table 10: Dependent Variable: Confirmed COVID-19 cases per 100,000 inhabitants.

Variable	**Model 5g**	**Model 5h**	**Model 5i**
(Intercept)	-127.26*	-213.60***	-11.17***
	(74.02)	(72.86)	(2.46)
Population density		0.90	-0.04
		(1.93)	(0.07)
Share from 25 to 44		-0.50	0.026
		(1.07)	(0.04)
Share above 65	2.38***	2.21**	0.10***
	(0.91)	(1.06)	(0.04)
Share of unmarried	3.50***	4.14***	0.14***
	(1.02)	(0.96)	(0.03)
Share of single households	-1.76***	-1.78***	-0.07***
	(0.46)	(0.50)	(0.02)
Share of non-western immigrants	-0.53	-0.71*	-0.02
	(0.34)	(0.41)	(0.01)
Share of water surface	2.47	2.22	-0.79***
	(8.71)	(8.75)	(0.28)
Share of overweight	-1.32		
	(0.91)		
Share with obesity	1.60		
	(1.53)		
Share with long-term illness		0.68	0.01
		(0.78)	(0.02)
Mean $PM_{2.5}$	2.75**	3.13**	0.28***
	(1.28)	(1.29)	(0.03)
λ	0.41*	0.40*	0.10
	(0.24)	(0.24)	(0.19)
ρ	0.45**	0.46*	-0.16
	(0.22)	(0.22)	(0.19)
R2	0.50	0.50	0.30
AICc	3265.34	3268.53	920.81
N	355	355	355

Standard Errors in parenthesis, significance levels as: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

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Message

From: Goffman.Joseph@epa.gov [Goffman.Joseph@epa.gov]
Sent: 11/30/2021 3:59:20 AM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
Subject: Re: AGs call

Looks good. Thanks, Tomas.

Sent from my iPhone

On Nov 29, 2021, at 10:48 PM, Carbonell, Tomas <Carbonell.Tomas@epa.gov> wrote:

Hi Joe, based on our discussion last week, here's a rough agenda for the call with the AGs tomorrow:

Ex. 5 Deliberative Process (DP)

Best,

Tomás

Appointment

From: Rakosnik, Delaney [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=274573739A9F446883072599086EDEDD-RAKOSNIK, D]
Sent: 12/10/2021 8:34:51 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]

Subject: HOLD || APPA
Attachments: APPA_12022021_ External meeting requests pdf.pdf
Location: TBD

Start: 12/17/2021 8:00:00 PM
End: 12/17/2021 8:30:00 PM
Show Time As: Busy

APPA_12022021_
External meeting...

Message

From: David Schonbrunn [David@Schonbrunn.org]
Sent: 10/30/2021 7:27:26 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]
CC: Segall, Craig@ARB [Craig.Segall@arb.ca.gov]; Chang, Edie@ARB [edie.chang@arb.ca.gov]; Dunham, Sarah [Dunham.Sarah@epa.gov]
Subject: Locomotive Emissions Petition
Attachments: EPA Locomotive Petition.pdf; ARB Tier 5 Locomotive Petition.pdf

Attached please find TRAC's Petition to the EPA, requesting a rule change pertaining to locomotive emissions. An email from EPA indicating receipt would be greatly appreciated.

Thank you.

--David

David Schonbrunn, President
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Air Resources Board

Mary D. Nichols, Chair
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Matthew Rodriquez
Secretary for
Environmental Protection

Edmund G. Brown Jr.
Governor

April 13, 2017

The Honorable Scott Pruitt, Administrator
U.S. Environmental Protection Agency
Office of the Administrator, Mail Code: 1101A
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Dear Administrator Pruitt:

I am writing to urge the U.S. Environmental Protection Agency (U.S. EPA) to exercise its authority to again adopt more stringent emission standards for locomotives. Reducing locomotive-related emissions and the resulting air toxic hot spots near railyards is a high priority for disadvantaged communities within California and around the nation. In addition, developing technology offers an opportunity for significant fuel cost savings for rail operations. A formal petition for U.S. EPA rulemaking is enclosed.

The gradual introduction of new locomotives meeting U.S. EPA's current Tier 4 emission standards will substantially reduce per-locomotive emissions and partially mitigate projected increases in rail traffic. However, locomotive activity in both impacted communities and severely polluted regions must approach zero emissions to protect the public health and welfare of the nation, as well as achieve federal air quality standards set by U.S. EPA. Developing control technologies offer the opportunity to further reduce locomotive emissions of toxic and criteria air pollutants beyond Tier 4 levels. In addition, use of on-board batteries can support zero-emission rail operation in sensitive areas, as well as cut fuel consumption and greenhouse gas (GHG) emissions.

Peer-reviewed studies have found that there are significant "diesel exposure disparities by race and income among residents living in close proximity to most of the major railyards in California."[1, 2] National locomotive emissions and diesel fuel standards, California Air Resources Board (ARB) agreements with railroads, California emission

[1] Hricko, Andrea, et al. "Global trade, local impacts: Lessons from California on Health Impacts and Environmental Justice Concerns for Residents Living near Freight Rail Yards." *International Journal of Environmental Research and Public Health* Vol. 11(2), 2014, pp. 1914-1941.
[2] U.S. EPA, "Age, Income, and Racial/Ethnic Composition of Populations Exposed to DPM in the Vicinity of Rail Yards and Terminals," Appendix H, 2003.

standards for drayage trucks and cargo equipment, and private and public investments in cleaner equipment are reducing overall emissions and health risk near our major railyards. But we cannot deliver on our collective responsibility to improve conditions on the ground for overburdened communities without new action by U.S. EPA to require a transition to zero and near-zero emission locomotives. ARB is requesting promulgation of updated emission standards, including standards for newly manufactured locomotives and standards for emissions upon remanufacture. Under the proposed standard, with capability for zero-emission operation, newly manufactured locomotives could achieve 99 percent control of oxides of nitrogen and diesel particulate matter, 98 percent control of hydrocarbons, and 10-25 percent control of GHGs.

Potential Amended Emission Standards for Newly Manufactured Locomotives and Locomotive Engines

Tier Level	Proposed Year of Manufacture	NOx		PM		GHG		HC		Proposed Effective Date
		Standard (g/bhp-hr)[1]	Percent Control[2]	Standard (g/bhp-hr)[1]	Percent Control[2]	Standard (g/bhp-hr)[1]	Percent Control[1]	Standard (g/bhp-hr)	Percent Control[2]	
5	2025	0.2	99+	<0.01	99	NA	10-25%	0.02	98	2025
		With capability for zero-emission operation in designated areas.								

1. ARB, Technology Assessment: Freight Locomotives, 2016.[3]
2. Compared with uncontrolled baseline, reflects percent control over line haul baseline for illustrative purposes; ARB staff assumed older pre-Tier 0 line haul and switch locomotives would be able to emit up to the Tier 0 PM emission standards, based on American Association of Railroads in-use emission testing (required to comply with U.S. EPA in-use emission testing requirements) for older switch locomotives with EMD 645 engines.

U.S. EPA has a long history of working for environmental justice in vulnerable, environmentally burdened, and economically disadvantaged communities. In the September 2016 *National Port Strategy Assessment*, U.S. EPA identifies the use of electric locomotives as an "effective port strategy to reduce [carbon dioxide] emissions."[4] In addition, U.S. EPA's *Draft EJ 2020 Action Agenda*[5] (Action Agenda) identifies air pollution from freight-related hubs (like seaports and railyards) as an important national issue. Taking action to deliver locomotives capable of zero-emission operation in overburdened communities would further Goal III of the Action Agenda, to demonstrate progress on significant national environmental justice challenges, and respond to

[3] ARB, Technology Assessment: Freight Locomotives, November 2016 <https://www.arb.ca.gov/msprog/tech/techreport/final_rail_tech_assessment_11282016.pdf> accessed December 9, 2016.
[4] U.S. EPA, National Port Strategy Assessment: Reducing Air Pollution and Greenhouse Gases at U.S. Ports, September 2016 <https://www.epa.gov/sites/production/files/2016-09/documents/420r16011.pdf> accessed December 15, 2016.
[5] U.S EPA, Draft EJ 2020 Action Agenda <https://www.epa.gov/sites/production/files/2016-05/documents/052216_ej_2020_strategic_plan_final_0.pdf> December 15, 2016.

Action 1.2, to identify and address potential adverse impacts from the commercial distribution of freight.

The same locomotive technology advances needed to protect communities near railyards and high-traffic rail corridors can also cut nitrogen oxides to aid California and other states' ability to achieve the National Ambient Air Quality Standards set by U.S. EPA. Even widespread national deployment of Tier 4 locomotives will not be sufficient to attain the 2015 ozone standard in California or to meet ambitious State and federal targets to cut GHGs and short-lived climate pollutants like black carbon.

ARB, aided by a contract with the University of Illinois, has conducted an in-depth assessment of locomotive technology, operations, and economics to identify options for California to transition to zero and near-zero emission locomotives. U.S. EPA rulemaking to tighten the national locomotive emission standards beyond the current Tier 4 requirements is the most efficient and cost-effective path. Such U.S. EPA action would support environmental justice initiatives in rail-impacted communities, attainment of ambient air quality standards, and climate progress around the country.

We urge U.S. EPA to exercise its authority to adopt more stringent emission standards for locomotives so that all states can meet federal air quality standards and climate goals, and address issues affecting the public health and welfare. We request a response to the enclosed petition by Summer 2017, to ensure adequate time for development of the proposed rulemaking. We are willing to assist in any way possible, including a partnership to perform technical analyses. If you would like to discuss this request, please call me at (916) 322-5840.

Sincerely,

Mary D. Nichols
Chair

Enclosure

cc: See next page.

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Honorable Board Members
California Air Resources Board

Richard W. Corey
Executive Officer
California Air Resources Board

BEFORE THE ADMINISTRATOR OF THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

PETITION FOR RULEMAKING SEEKING THE AMENDMENT OF THE LOCOMOTIVE EMISSION STANDARDS FOR NEWLY BUILT LOCOMOTIVES AND LOCOMOTIVE ENGINES AND LOWER EMISSION STANDARDS FOR REMANUFACTURED LOCOMOTIVES AND LOCOMOTIVE ENGINES

April 13, 2017

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Introduction and Summary

The California Air Resources Board (ARB) is the California State agency charged with promoting and protecting public health, welfare and ecological resources through the effective and efficient reduction of air pollutants, while recognizing and considering the effects on the economy of the State. ARB, in coordination with local air districts, is also responsible for attaining and maintaining the federal air quality standards set by the U.S. Environmental Protection Agency (U.S. EPA) under the federal Clean Air Act (CAA),[1] and for preparing California's State Implementation Plan (SIP), which lays out California's proposed plan for attainment of the federal air quality standards by identifying both the magnitude of emission reductions needed and the actions necessary to achieve those reductions by the required attainment deadline.[2]

Under the federal CAA, U.S. EPA has the sole authority to establish emissions standards for new locomotives and new engines used in locomotives.[3] By regulation, U.S. EPA has defined "new" locomotives to include both those newly manufactured and those existing locomotives that are remanufactured or rebuilt. Therefore, ARB, pursuant to Title 5, United States Code (U.S.C.) section 553(e) and the federal CAA, hereby petitions U.S. EPA to amend the current "Emission Standards for Locomotives and Locomotive Engines."

Specifically, ARB petitions U.S. EPA to promulgate a standard for newly built locomotives (to be referred to as Tier 5) and a new standard for Tier 4 locomotives upon remanufacture. ARB also petitions U.S. EPA to promulgate remanufacture standards equal to or more stringent than current Tier 4 emission levels for Tier 2 and 3 locomotive engines. Amending U.S. EPA's locomotive standard in these ways is included as an action in ARB's *Revised Proposed 2016 State Strategy for the SIP*. The amendment ARB seeks is vital to the public health and welfare of the nation, as well as to the State's ability to achieve and maintain the federal air quality standards set by U.S. EPA.

Background on Locomotives, Locomotive Operations, and Existing Regulations

While there are various locomotive technologies in use, most locomotives operating today use a diesel engine to drive an alternator, which powers electric traction motors to move the locomotive wheels. These are referred to as diesel-electric locomotives. Since locomotives use diesel engines as their primary power source, there are criteria, toxic, and climate change pollutant emissions associated with their operation, such as oxides of nitrogen (NOx), fine particulate matter 2.5 microns or less in diameter (PM2.5) and its subset of toxic diesel particulate matter (diesel PM), and greenhouse gases (GHG).

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[1] 42 U.S.C. § 7401 et. seq.
[2] California Health & Safety Code § 39602, 42 U.S.C. § 7410(a)(1).
[3] 42 U.S.C. § 7547(a)(5).

The total population of railroads operating in the U.S. consists of: freight railroads (categorized by three classes: Class I, II, and III), passenger railroads, and military and industrial railroads. The Federal Surface Transportation Board defines Class I (major), Class II (regional), or Class III (shortline) railroads based on inflation-adjusted annual operating revenue. In 2014, Class I major railroads were defined as having greater than $475 million in annual operating revenue.[4] Across the U.S., Class I operations generate the vast majority of locomotive activity and emissions, with most of that from interstate line haul locomotives. Using data from the American Association of Railroads, ARB staff estimates that the number of U.S. freight and passenger diesel-electric locomotives that are potentially subject to U.S. EPA locomotive regulations is about 31,000.[5] In the U.S., diesel locomotive engine use among freight railroads has risen from 800 million revenue ton-miles in 1970[6] to more than 1.7 billion revenue ton-miles in 2015,[7] and it is projected to further increase.

U.S. EPA defines two major categories of locomotives that operate in the nation: switch locomotives (switchers), and line haul locomotives. Switchers are specifically defined by U.S. EPA as having engines between 1,006 and 2,300 horsepower;[8] these locomotives tend to operate in and around railyards. Switchers are used to move smaller subsets of railcars from a nearby industry to the railyard, or move a group of railcars within a railyard, to ultimately form a larger regional or interstate freight train. Line haul locomotives have engines with a maximum rated power of 2,301 or more horsepower. Interstate freight trains typically utilize three or more interstate line haul locomotives within chains of railcars up to two miles long to power the movement of freight.

With their long useful life and durability, locomotive engines are designed to be remanufactured several times during their service life; typically, this is done every seven to ten years. Remanufacture is necessary to ensure the continued proper functioning of the engine. When the locomotive engine is remanufactured, it receives replacement parts, which are either freshly-manufactured or remanufactured to as-new condition; this includes the emission-related parts.[9] The emission level of a locomotive engine is dependent upon when it was manufactured or remanufactured, because the date of manufacture or remanufacture determines the standard to which the engine is certified.

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[4] Association of American Railroads, Rail Statistics of Class 1 Freight Railroads <https://www.aar.org/Documents/Railroad-Statistics.pdf> accessed December 12, 2016.
[5] ARB, Technology Assessment: Freight Locomotives, November 2016 <https://www.arb.ca.gov/msprog/tech/techreport/final_rail_tech_assessment_11282016.pdf> accessed December 9, 2016.
[6] U.S. Department of Transportation, Bureau of Transportation Statistics, U.S. Ton-Miles of Freight <http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/2002/html/table_01_44.html> accessed December 12, 2016.
[7] Surface Transportation Board, Office of Economics, Environmental Analysis, and Administration: Quarterly Earnings Reports, 2015 Fourth Quarter Earnings Compilation for All Class 1 Freight Railroads, 12 months ended December 31, 2015 <http://www.stb.dot.gov/econdata.nsf> accessed December 15, 2016.
[8] 40 CFR § 1033.901.
[9] U.S. EPA, Locomotive Emission Standards, Regulatory Support Document, April 1998, section 2.6.

U.S. EPA first established emission standards applicable to locomotives and locomotive engines in 1998, and the standards have been revised over time (see Table 1). Standards were applied to hydrocarbons (HC), NOx, and PM; U.S. EPA has expressed PM emission factors as either "PM" or "PM10." [10]

In 1998, U.S. EPA adopted Tier 0, Tier 1, and Tier 2 emission standards for original manufacture and for subsequent remanufactures of locomotives; these were applicable to locomotives with engine model years from 1973-2011. In 2008, U.S. EPA amended the 1998 locomotive regulation, establishing a Tier 3 and a Tier 4 emission standard, as well as stricter remanufacturing standards for remanufactured Tier 0-2 engines.[11]

The new Tier 3 PM emission standards went into effect for engine model years 2012-2014 for line haul locomotives and represented a minor step change. The Tier 4 line haul locomotive standard, effective in 2015, requires a reduction of NOx and PM emissions of 90 percent for NOx and 95 percent for PM, relative to pre-Tier 0. The key technologies used to achieve these reductions in NOx and PM emissions are exhaust gas recirculation and improvements to the cooling system. Tier 4 locomotives are commercially available and are now being phased in.

[10] U.S. EPA, Technical Highlights of Emission Factors for Locomotives (2009), <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100500B.PDF?Dockey=P100500B.PDF> accessed December 15, 2016. U.S. EPA uses particle mass to distinguish between the two categories of particle pollution. In U.S. EPA documents where factors are expressed as PM, "PM emissions can be expressed as PM10 (which includes all particles up to 10 microns in diameter) or PM2.5 (which includes only those particles 2.5 microns or less in diameter)." Per U.S. EPA Publication EPA-420-F-09-025, Emission Factors for Locomotives, (April 2009), "PM2.5 emissions can be estimated as 0.97 times the PM10 emissions, meaning that nearly all of the PM is [2.5 microns or less] in diameter."

[11] U.S. EPA, 40 CFR Parts 9, 85, et al.

Table 1:
Existing Federal Locomotive Emission Standards and Percent Control[1,2]

Line Haul Locomotives							
Emission Tier	Year of Manufacture	NOx		PM		HC	
		Standard (g/bhp-hr)	Percent Control	Standard (g/bhp-hr)	Percent Control	Standard (g/bhp-hr)	Percent Control
Pre-Tier 0	1973-1999	13.5[3]	n/a	0.6[3]	n/a	1.0	n/a
Tier 0	2000-2001	9.5	30	0.6	0	1.0	0
Tier 1	2002-2004	7.4	45	0.45	25	0.55	45
Tier 2	2005-2011	5.5	59	0.2	67	0.3	70
Tier 3	2012-2014	5.5	59	0.1	83	0.3	70
Tier 4	2015	1.3	90	0.03	95	0.14	86
Switch Locomotives							
Emission Tier	Year of Manufacture	NOx		PM		HC	
		Standard (g/bhp-hr)	Percent Control	Standard (g/bhp-hr)	Percent Control	Standard (g/bhp-hr)	Percent Control
Pre-Tier 0	1973-1999	17.4[3]	n/a	0.72[4]	n/a	2.1	n/a
Tier 0	2000-2001	14.0	20	0.72	0	2.1	0
Tier 1	2002-2004	11.0	37	0.54	25	1.2	43
Tier 2	2005-2011	8.1	53	0.24	67	0.6	71
Tier 3	2012-2014	5.0	71	0.1	86	0.6	71
Tier 4	2015	1.3	93	0.03	96	0.14	93

1. 40 CFR Part 1033.101, a.
2. U.S. EPA, Fact Sheet EPA-420-F-09-025, April 2009.
3. U.S. EPA, Locomotive Emissions Standards, Regulatory Support Document (U.S. EPA, 1998), p. 96 – Estimated NOx Emission Rates.
4. ARB staff assumed older pre-Tier 0 line haul and switch locomotives would be able to emit up to the Tier 0 PM emission standards, based on American Association of Railroads in-use emission testing (required to comply with U.S. EPA in-use emission testing requirements) for older switch locomotives with EMD 645 engines.

Historically, it has taken about seven years for U.S. locomotive manufacturers to implement new engine standards that represented a major step change. For example, it took General Electric and Electro-Motive Diesel, the two U.S. diesel-electric freight interstate line haul locomotive manufacturers, seven years to design, laboratory test, build prototypes, and field demonstrate a number of locomotives to be ready for commercial production of Tier 2 locomotives.[12] While the federal locomotive standards have achieved significant emission reductions since implementation of the first locomotive regulation in 2000, more stringent emission standards are needed to

[12] ARB, Technology Assessment: Freight Locomotives, November 2016 <https://www.arb.ca.gov/msprog/tech/techreport/final_rail_tech_assessment_11282016.pdf> accessed December 9, 2016.

address the air quality, public health, and climate change concerns associated with locomotive operations. This is discussed in detail in the next section.

Need for Amendment

A. U.S. EPA Must Amend the Current Locomotive Emission Standards to Help States to Meet the Federal Air Quality Standards.

Under the federal CAA, U.S. EPA is charged with protecting and enhancing "the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population."[13] To carry out this task, the Administrator must set federal air quality standards that the Administrator has judged are "requisite to protect the public health."[14] In response to new scientific evidence demonstrating health impacts at lower levels of pollution, U.S. EPA has progressively strengthened federal air quality standards to levels it has judged as requisite to protect the public health.[15] In 2015, U.S. EPA revised the primary and secondary 8-hour ozone standard from the 2008 level of 0.075 parts per million (ppm) to 0.070 ppm, and in 2013, the primary annual PM2.5 standard was revised from 15 micrograms per cubic meter ($\mu g/m^3$) to 12 $\mu g/m^3$.[16] U.S. EPA retained the secondary annual PM2.5 standard of 15 $\mu g/m^3$.

Although the states will be given time to comply with the updated standards, prior standards are still not being met in some places. According to a report released by the Congressional Research Service,[17] 122 million people (40 percent of the U.S. population) live in areas classified as being in nonattainment for the 2008 primary and secondary 8-hour ozone standard (0.075 ppm). These areas include 224 counties in 25 states, and the District of Columbia. A Congressional Research Service report on PM2.5 states that roughly 28 million people reside in the 39 counties U.S. EPA designated as nonattainment for the 2013 primary annual PM2.5 standard (12 $\mu g/m^3$).[18]

Around the country, states with rail operations face challenges in meeting the federal air quality standards set by U.S. EPA. States with high concentrations of rail activity and the highest locomotive emissions of NOx, which also have portions of the state in nonattainment of the 0.075 ppm primary and secondary 8-hour ozone standard include: California, Illinois, Pennsylvania, Maryland, New York, New Jersey, and Texas.

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[13] 42 U.S.C. § 7401(b).
[14] 42 U.S.C. § 7409(a) and (b).
[15] 40 CFR, Parts 50, 51, 52, and 58.
[16] U.S. EPA, NAAQS Table, March 29, 2015 <https://www.epa.gov/criteria-air-pollutants/naaqs-table> accessed April 21, 2016 and U.S. EPA, Table of Historical Ozone National Ambient Air Quality Standards (NAAQS), accessed March 4, 2016 <https://www.epa.gov/ozone-pollution/table-historical-ozone-national-ambient-air-quality-standards-naaqs> accessed December 12, 2016.
[17] Congressional Research Service, Ozone Air Quality Standards: EPA's 2015 Revision, January 2016 <https://fas.org/sgp/crs/misc/R43092.pdf> accessed December 12, 2016.
[18] Congressional Research Service, 2013 National Ambient Air Quality Standard (NAAQS) for Fine Particulate Matter (PM2.5): Designating Nonattainment Areas, December 2015 <https://www.fas.org/sgp/crs/misc/R43953.pdf> accessed December 12, 2016.

Portions of Pennsylvania are also in nonattainment of the primary annual 12 μg/m^3 PM2.5 and the secondary annual 15 μg/m^3 PM2.5 standards. Although designations using the primary and secondary 8-hour 0.070 ppm ozone standard have not yet been implemented, under current conditions U.S. EPA estimates at least 241 counties in 33 states would be in nonattainment.[19]

ARB has vigorously pursued the adoption and enforcement of regulations to help California meet the federal air quality standards. However, California continues to have some of the worst air quality in the nation. In 2015, PM2.5 emissions from all types of locomotive activity in California were estimated to be about 580 tons per year, about three percent of the total mobile source emissions for the State; NOx emissions from locomotives were estimated to be over 32,000 tons per year, about seven percent of all mobile source emissions for the State.

Current control programs for mobile sources are projected to reduce NOx and PM2.5 emissions in California over 50 percent between 2015 and 2031. However, meeting federal standards in the South Coast and San Joaquin Valley will require significant further reductions; this includes the attainment deadlines to meet the primary and secondary 8-hour 0.08 ppm ozone standard by 2023 in the South Coast and the San Joaquin Valley, the primary and secondary 8-hour 0.075 ppm ozone standard by 2031 in the South Coast and the San Joaquin Valley, and the primary annual 12 μg/m^3 PM2.5 standard by 2021 to 2025 in the South Coast and the San Joaquin Valley.

To achieve reductions in criteria and toxic emissions over the years, ARB has regulated many on-road and off-road mobile sources and the fuels that power them, including passenger vehicles, heavy-duty trucks, off-road equipment, ocean-going vessels, commercial harbor craft, etc. Incentives have played a key role in achieving early and extra reductions. Agreements have also been critical in helping achieve regional emissions reductions from locomotives. On climate, ARB has adopted far-reaching policies, such as the Regulation for the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms (the Cap-and-Trade Program), the Low Carbon Fuel Standard, and the Advanced Clean Cars Program.

These controls, combined with private investments and efforts at the local and federal level, have achieved measurable improvements in air quality and provide a down payment on the emission reductions needed to meet air quality standards. Nonetheless, given the severity of the State's challenges, particularly in the South Coast and the San Joaquin Valley, the only way to meet federal standards is for all source sectors to further cut emissions. Success in California and in many other states depends on policies to achieve reductions from sources under federal and international regulatory authority, such as locomotives.

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[19] U.S. EPA, NAAQS Table, March 29, 2015 <https://www.epa.gov/criteria-air-pollutants/naaqs-table> accessed December 12, 2016.

B. U.S. EPA Must Promulgate the Proposed Standards to Control the Dangers of Locomotive Emissions to the Public Health and Welfare.

U.S. EPA has the authority, and in fact, has the obligation, to set standards for locomotives and locomotive engines.[20] Locomotive activity creates a significant source of NOx and PM2.5. NOx is linked with a number of adverse effects on the respiratory system, and is a primary precursor to ground-level ozone, and fine particle pollution.[21] U.S. EPA calculated that locomotives emitted over 865,000 tons per year of NOx and around 26,000 tons per year of PM2.5 nationwide in 2011.[22]

PM2.5 contributes to premature death, as well as cardiac and respiratory illnesses. Many of the constituent chemicals in the subset of diesel PM are also federally identified hazardous air pollutants, including polycyclic organic matter, various metals such as arsenic, lead, and mercury, and polychlorinated dibenzo(p)dioxins and dibenzofurans.[23] ARB has identified diesel PM as a toxic air contaminant based on published evidence of a relationship between diesel exhaust exposure and lung cancer and other adverse health effects. Diesel PM also contributes to the same non-cancer health effects as PM2.5 exposure. These effects include premature death, hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma, increased respiratory symptoms, and decreased lung function in children.[24] Those most vulnerable to non-cancer health effects are children whose lungs are still developing and the elderly who often have chronic health problems.

In 2012, additional studies on the cancer-causing potential of diesel exhaust published since ARB's determination led the International Agency for Research on Cancer, a division of the World Health Organization, to list diesel engine exhaust as "carcinogenic to humans." This determination is based primarily on evidence from occupational studies that show a link between exposure to diesel particulate matter and lung cancer induction, as well as death from lung cancer.[25]

Concentrated local exposure in and around freight railyards and passenger locomotive maintenance yards is a particular hazard for yard workers and residents of nearby communities. Freight locomotives are cascaded down throughout their useful lives as they age, beginning in line haul work and ending in railyards or other locales in close proximity to residents. As a result, locomotives operating continuously near rail hubs

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[20] 42 U.S.C. § 7547.
[21] U.S. EPA, Nitrogen Dioxide <https://www.epa.gov/no2-pollution/basic-information-about-no2#Effects> accessed December 12, 2016.
[22] U.S. EPA, 2011 NEI data <https://www.epa.gov/air-emissions-inventories/2011-national-emissions-inventory-nei-data> accessed December 12, 2016.
[23] U.S. EPA, Urban Air Toxics <https://www.epa.gov/urban-air-toxics> accessed December 12, 2016.
[24] ARB, Diesel Exhaust and Health <https://www.arb.ca.gov/research/diesel/diesel-health.htm> accessed December 12, 2016.
[25] International Agency for Research on Cancer, Diesel and Gasoline Engine Exhausts and Some Nitroarenes, vol. 105, 2012.

and industrial centers are often among the oldest, and are therefore the least controlled and highest emitting.

California is home to a large number of railyards. Eight of its 18 major freight railyards are intermodal railyards with extensive truck traffic. California-specific requirements for cleaner fuels, trucks, and yard equipment have accelerated the reduction of emissions and health risks. Even with these stringent controls, ARB estimates that the highest risk railyards in California will still expose nearby residents to significant excess cancer risks.

In March 2015, the Office of Environmental Health Hazard Assessment released an update to its recommended methodology for conducting health risk assessments in California. For many facilities, including railyards and maintenance yards, use of the new risk assessment methodology and air dispersion model will result in higher estimated pollutant concentrations, higher exposures, and higher estimated potential cancer risks than would have been calculated with the prior (2003) methodology—for the same level of emissions. The historical potential inhalation cancer risk using the new methodology may be 1.5 to three times (or more) higher than what was estimated using the 2003 methodology that was the basis for ARB's health risk assessments of the 18 major railyards.[26]

The remaining 10 of the 18 major railyards in the State are identified as classification railyards, where chains of railcars are broken up or assembled by a switcher based on their common destination. In classification railyards, locomotives that power or build trains are refueled and are subject to ongoing service and maintenance. These activities result in engine idling time, which results in emissions that can increase associated health risks in nearby communities. Depending on the type of railyard, freight interstate line haul locomotives can contribute 70 to 100 percent of railyard diesel PM emissions.[27]

In California and across the nation, these harmful emissions often occur in or near densely populated areas and neighborhoods, creating toxic "hot spots." For example, U.S. EPA's 2011 National Air Toxics Assessment maps show high levels of cancer risk and high concentrations of respiratory hazards in the communities near operations in Chicago, Dallas/Fort Worth, Houston, Atlanta, Minneapolis/St. Paul, Seattle, Portland, and the various ports in and around New York City.[28]

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[26] ARB, Railyard Health Risk Assessment and Mitigation Measures <https://www.arb.ca.gov/railyard/hra/hra.htm> accessed December 12, 2016.
[27] ARB, Technology Assessment: Freight Locomotives, November 2016 <https://www.arb.ca.gov/msprog/tech/techreport/final_rail_tech_assessment_11282016.pdf> accessed December 9, 2016.
[28] U.S. EPA, 2011 National Air Toxics Assessment Map <https://www.epa.gov/national-air-toxics-assessment/2011-nata-map> accessed December 12, 2016.

Reducing GHG emissions from locomotives is also a concern for California, the entire country, and the world. U.S. EPA has the authority to and must regulate sources of air pollution and GHG which endanger the public health or welfare.[29] The 2015 United Nations Agreement on Climate Change (Paris Agreement) noted with concern that

> . . . much greater emission reduction efforts will be required than those associated with the intended nationally determined contributions in order to hold the increase in the global average temperature to below 2°C above pre-industrial levels.

Participants in the Paris Agreement also acknowledged: "All Parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies."[30] GHG emissions from locomotives are increasing; U.S. EPA estimates that nationwide GHG emissions from rail transport grew by 21.4 percent from 1990 to 2014.[31] In addition to GHG, PM2.5 constituents include black carbon, a powerful short-lived climate pollutant which darkens and warms the atmosphere and accelerates snow melt.[32]

C. U.S. EPA Must Promulgate The Proposed Standards Because They Obtain the Greatest Degree of Emission Reduction Achievable Through The Application Of Technology Which The Administrator Determines Will Be Available for Regulated Locomotives and Locomotive Engines.

The Administrator must promulgate emission standards for new locomotives and locomotive engines which

> . . . achieve the greatest degree of emission reduction achievable through the application of technology which the Administrator determines will be available for the locomotives or engines to which such standards apply, giving appropriate consideration to the cost of applying such technology within the period of time available to manufacturers and to noise, energy, and safety factors associated with the application of such technology.[33]

Such standards are to take effect at the earliest possible date, considering lead time necessary for the development and application of requisite technology and the cost of compliance, energy, and safety.[34]

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[29] *Massachusetts v. U.S. EPA,* 549 U.S. 497 (2007).
[30] Conference of the Parties to the United Nations Framework Convention on Climate Change, Paris Agreement, Article 4.
[31] U.S. EPA, Fast Facts U.S. Transportation Sector Greenhouse Gas Emissions 1990-2014, June 2016 <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100ONBL.pdf> accessed December 12, 2016.
[32] U.S. EPA, Report to Congress on Black Carbon, March 2012, section 2.6.2.
[33] 42 U.S.C. § 7547(a)(5).
[34] *Id.* § 7547(b).

The federal CAA is technology-forcing, and the Administrator may adopt standards which require the use of technology which is expected to be available in the foreseeable future.[35] The current U.S. EPA Tier 4 locomotive emission standards no longer reflect the best available technology. Since the 2008 amendment of the locomotive engine emission standards, technology has advanced significantly, allowing for additional emission reduction benefits. New, stricter standards for both newly built locomotives and remanufactured locomotives are feasible with the advanced technologies currently being developed and tested.[36] Technologies such as aftertreatment (compact selective catalytic reduction (SCR), diesel oxidation catalyst (DOC) filters), and on-board batteries for hybrid-electric locomotives, as well as battery and fuel-cell electric locomotives with zero-exhaust emissions, could be used to achieve the reductions needed in diesel PM, PM2.5, NOx, and GHG.[37]

Aftertreatment-equipped locomotives can be augmented with on-board batteries to provide an additional 10-25 percent reduction in fuel consumption and GHG emissions. On-board batteries provide zero-emission track mile capabilities in and around railyards to further reduce PM and associated health risks in nearby communities. It is feasible for locomotives with these technologies to be available in the timeframe proposed in Table 2, and to advance progress towards zero-emission locomotives. In addition, emission performance standards should be established now to allow adequate time for full demonstration and testing in locomotive applications for these and other feasible technologies.

Petition

U.S. EPA should exercise its authority to amend the current "Emission Standards for Locomotives and Locomotive Engines" to achieve emission rates equal to or less than those shown in Table 2. Specifically, U.S. EPA should establish a standard for newly built locomotives (to be referred to as Tier 5), and a new standard for Tier 4 engines upon remanufacture (to be referred to as Tier 4+). U.S. EPA should also establish standards equal to or more stringent than the current Tier 4 level (to be referred to as Tier 2++, Tier 3+), upon remanufacture of Tier 2 and 3 locomotive engines. The emission rates identified in Table 2 are based on the extensive analysis presented in ARB's 2016 *Technology Assessment: Freight Locomotives*.[38]

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[35] 42 U.S.C. § 7412 (d) and § 7547 (a)(3)and (a)(4).

[36] University of Illinois, Transitioning to a Zero or Near-Zero Emission Line-Haul Freight Rail System in California: Operational and Economic Considerations. <http://www.arb.ca.gov/railyard/docs/uoi_rpt_06222016.pdf> accessed December 12, 2016.

[37] ARB, Technology Assessment: Freight Locomotives, November 2016 <https://www.arb.ca.gov/msprog/tech/techreport/final_rail_tech_assessment_11282016.pdf> accessed December 9, 2016.

[38] ARB, Technology Assessment: Freight Locomotives, November 2016 <https://www.arb.ca.gov/msprog/tech/techreport/final_rail_tech_assessment_11282016.pdf> accessed December 9, 2016.

Table 2:
Potential Amended Emission Standards for Locomotives and Locomotive Engines

Tier Level	Year of Manufacture	NOx		PM		GHG		HC		Proposed Effective Date
		Standard (g/bhp-hr)[1]	Percent Control[2]	Standard (g/bhp-hr)[1]	Percent Control[2]	Standard (g/bhp-hr)[1]	Percent Control[2]	Standard (g/bhp-hr)	Percent Control[2]	
2++	2005-2011	1.3	90	0.03	95	NA	0	0.14	85	2023
3+	2012-2014	1.3	90	0.03	95	NA	0	0.14	85	2023
4+	2015-2024	0.3	99	<0.01	99	NA	0	0.05	95	2023
5	2025	0.2	99+	<0.01	99	NA	10-25%	0.02	98	2025
		With capability for zero-emission operation in designated areas.								

1. ARB, Technology Assessment: Freight Locomotives, 2016.[39]
2. Compared with uncontrolled baseline, reflects percent control over line haul baseline for illustrative purposes; ARB staff assumed older pre-Tier 0 line haul and switch locomotives would be able to emit up to the Tier 0 PM emission standards, based on American Association of Railroads in-use emission testing (required to comply with U.S. EPA in-use emission testing requirements) for older switch locomotives with EMD 645 engines.

If U.S. EPA promulgates the requested amendments such that they are effective by 2020 or earlier, ARB proposes that the Tier 5 standards go into effect in 2025; these standards should reduce GHG by 10-25 percent, NOx by at least 99 percent, and PM by at least 99 percent, relative to pre-Tier 0. Staff believes these reductions are attainable for both switchers and line haul locomotives in freight and passenger rail service.

As previously explained, Congress has specifically authorized U.S. EPA to promulgate these proposed amendments, which would establish emission standards for new locomotives and locomotive engines that safely achieve the greatest possible reductions at the earliest possible date, through the use of applicable technology.[40] The federal CAA is technology-forcing, and the Administrator may promulgate standards which require the use of technology which is expected to be available in the foreseeable future.[41] Since the 2008 amendment of the locomotive engine emission standards, technology has advanced significantly, allowing for additional emission reduction benefits. Stricter standards are feasible with technologies, including SCR, DOC filters, on-board batteries for hybrid electric locomotives, and battery and fuel-cell electric locomotives with zero-exhaust emissions. Standards should be established

[39] ARB, Technology Assessment: Freight Locomotives, November 2016 <https://www.arb.ca.gov/msprog/tech/techreport/final_rail_tech_assessment_11282016.pdf> accessed December 9, 2016.
[40] *Id.* § 7547(a)(5); *International Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 648 (D.C. Cir. 1973); NRDC vs. *U.S. Envtl. Protection Agency* 06-73217 (D.C. Cir. 2014); 42 U.S.C. § 7547 (b).
[42] 42 U.S.C. § 7547(a)(5).

now to allow adequate time for full demonstration and testing in locomotive applications for this and other feasible technologies.

ARB staff estimates that U.S. EPA could require manufacturers to implement the new locomotive emission regulations by as early as 2023 for remanufactured locomotives and 2025 for newly manufactured locomotives. This estimate would allow seven years to develop and apply the technology for new Tier 5 standards. The proposal for stricter remanufacturing standards would allow five years for locomotive engine manufacturers to apply improved engine designs and technologies in their remanufacturing practices. The costs and development timelines would be in line with those seen in prior locomotive engine standard promulgations.

A new Tier 4 freight interstate line haul locomotive costs about $3 million, ARB staff estimates a compact SCR/DOC system could cost an additional $250,000 per locomotive, bringing the cost of a Tier 4+ locomotive to about $3.25 million. ARB staff estimates that a locomotive capable of Tier 5 standards, with compact SCR and DOC aftertreatment and on-board batteries, would have total capital costs of about $4 million. This would represent about an additional $1 million beyond Tier 4.[42]

Conclusion

California has achieved tremendous success in reducing harmful emissions. For California and for many other states to reduce toxic hot spots and to meet critical air quality standards and climate goals, we must achieve reductions beyond those that the states can reach on their own under existing programs. Achieving these goals will provide much needed public health protection for millions of Americans who still breathe unhealthy air, and will improve air quality in our most disadvantaged communities.

Timely action is critical. ARB is requesting that U.S. EPA promulgate the requested amendments such that they are effective by 2020 or earlier. California's *Revised Proposed 2016 State Strategy for the SIP* relies on the benefits that can be achieved by U.S. EPA promulgation of more protective emission standards for newly manufactured and remanufactured locomotives. Delaying promulgation until a later date would impede achievement of the federal air quality standards that U.S. EPA established, and forego critical emission and health benefits in California and throughout the nation.

ARB requests that U.S. EPA amend the current "Emission Standards for Locomotives and Locomotive Engines" and requests a response to this petition by Summer 2017, in order to ensure adequate time to develop the proposed rulemaking. ARB offers itself as a partner to provide technical assistance during the rulemaking process.

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[42] ARB, Technology Assessment: Freight Locomotives, November 2016 <https://www.arb.ca.gov/msprog/tech/techreport/final_rail_tech_assessment_11282016.pdf> accessed December 9, 2016.

Appointment

From: Johnson, Antoinette [Johnson.Antoinette@epa.gov]
Sent: 11/23/2021 7:44:54 PM
To: Johnson, Antoinette [Johnson.Antoinette@epa.gov]; Peterson, Geoffrey [peterson.geoffrey@epa.gov]; Goffman, Joseph [Goffman.Joseph@epa.gov]; Kraft, Andrew [Kraft.Andrew@epa.gov]; Keshava, Nagalakshmi [Keshava.Nagu@epa.gov]; Hotchkiss, Andrew [Hotchkiss.Andrew@epa.gov]; Soto, Vicki [Soto.Vicki@epa.gov]; CPAD Calendar [CPAD_Calendar@epa.gov]; Waleko, Garland [Waleko.Garland@epa.gov]

Subject: CPAD Check-in Meeting for Mercury Salts
Location: Microsoft Teams Meeting

Start: 12/21/2021 9:00:00 PM
End: 12/21/2021 9:30:00 PM
Show Time As: Busy

Recurrence: Monthly
the third Tuesday of every 1 month(s) from 4:00 PM to 4:30 PM
Required Attendees: Kraft, Andrew; Keshava, Nagalakshmi; Hotchkiss, Andrew; Soto, Vicki; CPAD Calendar; Waleko, Garland; Peterson, Geoffrey; Goffman, Joseph

---

Microsoft Teams meeting

Join on your computer or mobile app
Click here to join the meeting

Or call in (audio only)
Ex. 6 Personal Privacy (PP) United States, Washington DC
Phone Conference ID: Ex. 6 Personal Privacy (PP)
Find a local number | Reset PIN

By participating in EPA hosted virtual meetings and events, you are consenting to abide by the agency's terms of use. In addition, you acknowledge that content you post may be collected and used in support of FOIA and eDiscovery activities.

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Appointment

From: Johnson, Antoinette [Johnson.Antoinette@epa.gov]
Sent: 11/23/2021 8:37:34 PM
To: Johnson, Antoinette [Johnson.Antoinette@epa.gov]; Goffman, Joseph [Goffman.Joseph@epa.gov]

Subject: Canceled: CPAD Check-in Meeting for Mercury Salts
Location: Microsoft Teams Meeting

Start: 12/21/2021 9:00:00 PM
End: 12/21/2021 9:30:00 PM
Show Time As: Free

Importance: High

Recurrence: Monthly
the third Tuesday of every 1 month(s) from 4:00 PM to 4:30 PM
Required Attendees: Kraft, Andrew; Keshava, Nagalakshmi; Hotchkiss, Andrew; Soto, Vicki; CPAD Calendar; Waleko, Garland; Peterson, Geoffrey; Gift, Jeff

---

Microsoft Teams meeting

Join on your computer or mobile app
Click here to join the meeting

Or call in (audio only)
Ex. 6 Personal Privacy (PP) United States, Washington DC
Phone Conference ID: Ex. 6 Personal Privacy (PP) #
Find a local number | Reset PIN

By participating in EPA hosted virtual meetings and events, you are consenting to abide by the agency's terms of use. In addition, you acknowledge that content you post may be collected and used in support of FOIA and eDiscovery activities.

Learn More | Meeting options

Message

From: Ex. 6 Personal Privacy (PP)
Sent:
To:
CC: Goffman, Joseph [Goffman.Joseph@epa.gov]; charles.k.gatebe@nasa.gov; robert.w.bergstrom@nasa.gov; thaopaul.v.bui@nasa.gov; cecilia.s.chang@nasa.gov; jonathan.m.dean-day@nasa.gov; yohei.shinozuka@nasa.gov; washington.field@ic.fbi.gov; Matt Zapotosky [matt.zapotosky@washpost.com]; wburns@cia.gov
Subject: Trail Clouds Over Washington DC and Definitive Explanation of "Chemtrails"
Attachments: IMG_2821.jpg; IMG_2822.jpg; IMG_2823.jpg; IMG_2825.jpg; Flakes.jpg

These photos were taken a few days ago of the skies over Washington DC where I live. My house is situated right on the border of the District of Columbia and Maryland. The street you see going up the hill in the first photo is the border of the District of Columbia and Maryland. Obviously this is non-natural and shows a systematic approach to this activity. Video of aircraft conducting this activity at this location was taken at this time.

This activity is giving a false impression. In other words, this particular activity of dropping materials from aircraft may not be significantly affecting the weather. It may be actually facilitating technologies known as people-affecting technologies. I am the patent holder of one type of this technology and others that have been used by the CIA, the FBI and the Department of Defense. I have never authorized, condoned or consented to this activity. Until recently, it was being done without my knowledge. This is unauthorized, non-governmental activity being done in the interest of a group of people in the intelligence community that has worked quietly in their own private interests to remove control and assets from the Federal government for decades. The group has cultivated conspiracy theories about its activities in order to maintain secrecy and uncertainty about their existence.

The materials are being dropped primarily from unmanned aircraft. Some of this activity may be based and operating from air and storage facilities around the country which is unaware of these activities and is not tracking them. The people conducting these activities have strategies and technologies to keep their activities hidden. The aircraft may be specially designed for this purpose.

The materials being dropped from aircraft contain a composite of bauxite, silica and traces of mercury (Hg). Aside from the mercury, these particular materials dropped for the purpose of technological facilitation are not highly toxic and do not contain biological agents. Needless to say, however, this is unnecessary and unauthorized activity at best. These sometimes take the form of tiny white soap-flake or shavings like material. One might be able to find samples of this material in an urban park on a dark stone area before a major rainstorm. Attached is a photo taken on October 1, 2021 of this material found by me in Sligo Creek Park near Takoma Park, MD.

In a 2013 United Nations report [4], atmospheric Hg concentrations were estimated to have increased by 300–500% over the past century. Because of the naturally high Hg amount present in soil, the average Hg increase was 20% in surface organic soil.

Please note that my emails, phone calls and letters have sometimes been blocked and intercepted. Ex. 6 Personal Privacy (PP)
Ex. 6 Personal Privacy (PP)

Message

From: Goffman.Joseph@epa.gov [Goffman.Joseph@epa.gov]
Sent: 1/5/2022 3:48:11 AM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Hooper, Daniel [hooper.daniel@epa.gov]
Subject: Re: FOR YOUR CONCURRENCE: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Thanks.

Sent from my iPhone

On Jan 4, 2022, at 10:41 PM, Carbonell, Tomas <Carbonell.Tomas@epa.gov> wrote:

Ex. 5 Deliberative Process (DP)

Tomás

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, January 4, 2022 4:23 PM
To: Goffman, Joseph <Goffman.Joseph@epa.gov>
Cc: Carbonell, Tomas <Carbonell.Tomas@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR YOUR CONCURRENCE: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Joe, the attached (clean and RLSO versions) is ready for your review and concurrence to send to OP to initiate OMB review. Tomás has reviewed and concurred (below). This action is court ordered for May 2.

Thank you,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Sent: Tuesday, January 4, 2022 3:53 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: RE: FOR YOUR CONCURRENCE: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Great, thanks. I concur in sending this forward to Joe. Best,

Tomás

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, January 4, 2022 3:37 PM
To: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR YOUR CONCURRENCE: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Tomas, the program concurs with your latest edit(s). Shall I move this forward to Joe?

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Chang, Alice <Chang.Alice@epa.gov>
Sent: Tuesday, January 4, 2022 3:02 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Mcquilkin, Wendy <Mcquilkin.Wendy@epa.gov>; Iglesias, Amber <Iglesias.Amber@epa.gov>
Subject: FW: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Good to go with these, Ann. Please see attached!

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, January 4, 2022 12:25 PM
To: Chang, Alice <Chang.Alice@epa.gov>
Cc: Iglesias, Amber <Iglesias.Amber@epa.gov>
Subject: FW: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Alice, one last change in the attached. Please let me know if the program concurs and we'll move this forward to Joe. Thank you.

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Sent: Tuesday, January 4, 2022 12:22 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: RE: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Thanks Ann, I really appreciate the team's patience in iterating on this. The latest changes look good. In reviewing the summary of our rationale for the final action, Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP) Hopefully this will be last round! Best,

Tomás

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, January 4, 2022 7:59 AM
To: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Tomas, the program has responded to your last round of edits in the attached. Please let me know if you concur.

Thank you.

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Chang, Alice <Chang.Alice@epa.gov>
Sent: Tuesday, January 4, 2022 7:52 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>; Culligan, Kevin <Culligan.Kevin@epa.gov>; Iglesias, Amber <Iglesias.Amber@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: RE: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Ann – please see revised document. Thanks!

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, December 21, 2021 4:14 PM
To: Culligan, Kevin <Culligan.Kevin@epa.gov>; Chang, Alice <Chang.Alice@epa.gov>; Iglesias, Amber <Iglesias.Amber@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: Fwd: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Few more edits from Tomas. Please let me know if you all are comfortable with these and we'll move it along to Joe. Thanks.

Ann (Campbell) Ferrio
Chief of Staff
Office of Air and Radiation
(202) 566-1370

Begin forwarded message:

From: "Carbonell, Tomas" <Carbonell.Tomas@epa.gov>
Date: December 21, 2021 at 3:57:01 PM EST
To: "Campbell, Ann" <Campbell.Ann@epa.gov>
Cc: "Hooper, Daniel" <hooper.daniel@epa.gov>
Subject: RE: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Thanks so much Ann. Have suggested a few more edits to the discussion of Minamata in the attached – assuming the program is good to go with these, I concur with sending this forward to Joe. Best,

Tomás

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, December 21, 2021 11:02 AM
To: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR YOUR RE-REVIEW: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Tomas, the attached has been revised pursuant to your comments and is ready for your re-review and concurrence to initiate OMB review.

Thank you,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Chang, Alice <Chang.Alice@epa.gov>
Sent: Tuesday, December 21, 2021 10:28 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Olson, Heather <Olson.Heather@epa.gov>; Iglesias, Amber <iglesias.Amber@epa.gov>; Culligan, Kevin <Culligan.Kevin@epa.gov>
Subject: Revised: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Ann – please see revised document with Tomas' comments addressed. RLSO and clean versions attached.

Let me know if you have any questions.

From: French, Chuck <French.Chuck@epa.gov>
Sent: Tuesday, December 21, 2021 10:02 AM
To: Joseph, Wanda <joseph.wanda@epa.gov>; Mulrine, Phil <Mulrine.Phil@epa.gov>
Cc: Gates, Adrian <gates.adrian@epa.gov>; Cozzie, David <Cozzie.David@epa.gov>; South, Peter <South.Peter@epa.gov>
Subject: RE: EDITS NEEDED: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Hi Adrian and Wanda,

Yes. We addressed the OAR edits. And OGC approves of this going forward. Attached is a mark-up version that shows all the edits, and a new clean version with all edits accepted.

Let us know if you have questions.

Thank You!

Chuck

Phone: Ex. 6 Personal Privacy (PP)

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Sunday, December 12, 2021 5:04 PM
To: Iglesias, Amber <Iglesias.Amber@epa.gov>; Chang, Alice <Chang.Alice@epa.gov>
Cc: Morgan, Ruthw <morgan.ruthw@epa.gov>; Olson, Heather <Olson.Heather@epa.gov>; Lubetsky, Jonathan <Lubetsky.Jonathan@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Subject: EDITS NEEDED: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Please find attached edits/comments from Tomas. Please be sure to send an RLSO back up when completed for ease of review. Thank you!

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Sent: Saturday, December 11, 2021 12:31 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: RE: FOR YOUR REVIEW: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Hi Ann, thanks for this. Here are my comments on the preamble – there are several areas where I've called for clarification or otherwise recommended substantive changes. I'd be happy to take a look at a new version when ready. Best,

Tomás

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, December 7, 2021 8:47 AM
To: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR YOUR REVIEW: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Tomás, the attached is ready for your review and concurrence for sending to OMB. As with the GHGRP rule yesterday, the program hopes to upload this to OMB NLT 12/17.

Thank you,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Mcquilkin, Wendy <Mcquilkin.Wendy@epa.gov>
Sent: Tuesday, December 7, 2021 8:34 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Cc: OAQPSREGPROCESSING <OAQPSREGPROCESSING@epa.gov>
Subject: SAN7546 OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

SAN 7546 - OMB

TO: THE IMMEDIATE OFFICE FOR REVIEW AND TRANSMITTAL FOR OMB

Attached is the OMB package for Mercury Cell Chlor-Alkali RTR final rule. This is a "non-significant" tier 2 action with a court-ordered signature date of May 2, 2022. The signature date for this package is 3/31/21 and we would like to ensure OMB receives this rule by the Dec 17th cut off to upload new projects into ROCIS.

POC: Amber Iglesias
202-564-3175

Wendy

Message

From: Carbonell, Tomas [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=15EC2A6AD2934C669F6A675E7CF4961B-CARBONELL,]
Sent: 11/24/2021 1:55:26 PM
To: Campbell, Ann [Campbell.Ann@epa.gov]
CC: Hooper, Daniel [hooper.daniel@epa.gov]
Subject: RE: FOR INFORMAL REVIEW: GHGRP Proposed Rule, without Supart I
Attachments: SAN 7230 Proposed Rule - Full Version TC.docx

Hi Ann, thanks very much – I've finally reviewed the GHGRP package and have attached some very minor edits and a few comments/questions for the program's consideration. Hope you both have a happy Thanksgiving!

Tomás

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, November 16, 2021 6:46 PM
To: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR INFORMAL REVIEW: GHGRP Proposed Rule, without Supart I

Tomás, I believe the other morning you mentioned you were on point for the review of the entire GHGRP package. I've attached here the package I sent to you previously, and have added Subpart I (email attachment at the end). OAP is hoping to get a complete set of OAR IO comments by November 29. They are targeting getting this in to OMB review before the holidays.

Let me know if you have any questions. Thank you!

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Campbell, Ann
Sent: Monday, November 8, 2021 7:29 AM
To: Nunez, Alejandra <Nunez.Alejandra@epa.gov>; Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Cc: Goffman, Joseph <Goffman.Joseph@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR INFORMAL REVIEW: GHGRP Proposed Rule, without Supart I

Tomas, Ale – attached is the GHGRP proposed rule for your review. This is coming to you informally for review. Subpart I has been removed consistent with Ale and Joe's recusal. Tomas, I will therefore get you subpart I under separate cover. No deadline.

Thanks,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: Carbonell, Tomas [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=15EC2A6AD2934C669F6A675E7CF4961B-CARBONELL,]
Sent: 12/11/2021 5:31:18 PM
To: Campbell, Ann [Campbell.Ann@epa.gov]
CC: Hooper, Daniel [hooper.daniel@epa.gov]
Subject: RE: FOR YOUR REVIEW: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)
Attachments: EO12866_2060-AU59_EPA Mercury Cell Chlor-alkali Plants RTR Final Rule 1262021.docx

Hi Ann, thanks for this. Here are my comments on the preamble – there are several areas where I've called for clarification or otherwise recommended substantive changes. I'd be happy to take a look at a new version when ready. Best,

Tomás

From: Campbell, Ann <Campbell.Ann@epa.gov>
Sent: Tuesday, December 7, 2021 8:47 AM
To: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Cc: Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR YOUR REVIEW: OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

Tomás, the attached is ready for your review and concurrence for sending to OMB. As with the GHGRP rule yesterday, the program hopes to upload this to OMB NLT 12/17.

Thank you,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Mcquilkin, Wendy <Mcquilkin.Wendy@epa.gov>
Sent: Tuesday, December 7, 2021 8:34 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Cc: OAQPSREGPROCESSING <OAQPSREGPROCESSING@epa.gov>
Subject: SAN7546 OMB Package-National Emission Standards for Hazardous Air Pollutants: Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (SAN 7546)

SAN 7546 - OMB

TO: THE IMMEDIATE OFFICE FOR REVIEW AND TRANSMITTAL FOR OMB

Attached is the OMB package for Mercury Cell Chlor-Alkali RTR final rule. This is a "non-significant" tier 2 action with a court-ordered signature date of May 2, 2022. The signature date for this package is 3/31/21 and we would like to ensure OMB receives this rule by the Dec 17th cut off to upload new projects into ROCIS.

POC: Amber Iglesias
202-564-3175

Wendy

Message

From: Carbonell, Tomas [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=15EC2A6AD2934C669F6A675E7CF4961B-CARBONELL,]
Sent: 12/11/2021 10:55:41 PM
To: Nunez, Alejandra [Nunez.Alejandra@epa.gov]
Subject: RE: FARR sections for your review
Attachments: EO12866_FARR Part 49 2012-AA02 PRM 20211008 (006) an tc.docx

Thanks so much for reviewing this rule, Ale. I took a look at the highlighted sections and had just a couple of suggested edits and comments – please see attached. Have a good weekend!

Tomás

From: Nunez, Alejandra <Nunez.Alejandra@epa.gov>
Sent: Wednesday, November 24, 2021 3:20 PM
To: Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Subject: FARR sections for your review

Hi Tomas,
In advance thank you so much for your patience. I am attaching my version of the draft FARR (with just a few edits). I

Ex. 5 Deliberative Process (DP)

question) are the only areas where I have questions.
Many thanks for looking at this.

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 10/26/2021 8:34:21 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Hooper, Daniel [hooper.daniel@epa.gov]
Subject: FOR YOUR REVIEW: Signature Package for: Paint Stripping NPRM (SAN 8339)
Attachments: FRN 6H Proposal Preamble 19Oct21_jdf.docx; FRN 6H Proposal Preamble 19Oct21_clean.docx

Tomas, some changes have been made to the preamble around the Ex. 5 Deliberative Process (DP) The RLSO is provided (and is below). Would you like to review?

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Iglesias, Amber <Iglesias.Amber@epa.gov>
Sent: Tuesday, October 26, 2021 8:48 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Mcquilkin, Wendy <Mcquilkin.Wendy@epa.gov>; Chang, Alice <Chang.Alice@epa.gov>
Subject: FW: Signature Package for: Paint Stripping NPRM (SAN 8339)

Ann,

Please see the message below regarding changes to the Paint Stripping RTR preamble's Ex. 5 Deliberative Process (DP) and the RLSO and clean version of the preamble for Paint Stripping NPRM. If you are okay with this moving to OP I can send straight to Darryl but I wanted to route this through your first. Thank you!

Amber Iglesias
Office of Air Quality Planning and Standards
1200 Pennsylvania Avenue N.W.
Washington, DC 20004
202-564-3175

From: Feather, John <feather.john@epa.gov>
Sent: Tuesday, October 26, 2021 7:50 AM
To: Joseph, Wanda <joseph.wanda@epa.gov>
Cc: Barnett, Keith <Barnett.Keith@epa.gov>
Subject: RE: Signature Package for: Paint Stripping NPRM (SAN 8339)

Good morning,

Sorry for the late notice, but we have made minor changes to the preamble's SSM discussion, based on recommendations from our SSM lead and OGC. These changes have been reviewed and approved by Mike Benson, Lisa Conner, and my OGC rep. I have also kept my OP rep apprised of these changes. I'm attaching a version of the preamble with those changes in redline and clean versions. I have made according changes in the proposed regulatory language and amendatory text, but these edits would not affect other documents (such as the comms materials sent out

alongside preamble). I also don't believe that it would be a significant issue of interest for other past or current reviewers. The changed preamble language is snipped below for reference (with edited draft amendatory language as context [though I will just replace the entire table, as best practice])

Please feel free to get in touch with me if you have any questions

Best,
John Feather
Environmental Engineer
US EPA OAR/OAQPS/SPPD
Minerals and Manufacturing Group
(919) 541-3052

Preamble, part 1

Ex. 5 Deliberative Process (DP)

Preamble, part 2

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

From: Joseph, Wanda <joseph.wanda@epa.gov>
Sent: Tuesday, October 19, 2021 1:09 PM
To: Iglesias, Amber <Iglesias.Amber@epa.gov>
Cc: Chang, Alice <Chang.Alice@epa.gov>; Culligan, Kevin <Culligan.Kevin@epa.gov>; Cozzie, David <Cozzie.David@epa.gov>; South, Peter <South.Peter@epa.gov>; Feather, John <feather.john@epa.gov>; Barnett, Keith <Barnett.Keith@epa.gov>
Subject: Signature Package for: Paint Stripping NPRM (SAN 8339)
Importance: High

Amber,

Attached is the signature package for National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources (SAN 8339). This is a tier 3 action and was determined "non-significant by OMB. This proposal package has a court order deadline of 11/1/2021 for signature. The CMS Control number is OAR-22-000-0338. Please let me know if you need any additional information for this packet.

Thanks,

Wanda Joseph (She/Her)
Regulatory Liaison
Sector Policies and Programs Division
109 T.W. Alexander Drive, MC: D205-01
Research Triangle Park, NC 27711
(919) 541-3114

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 10/27/2021 9:59:28 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Thursday, October 28th, 2021
Attachments: OAR BC Rescission Final Rule Options Select-102621-FINAL.docx; Agenda, Fall 2021 ADD, Final.pdf; 10.28.21 Fall 2021 ADD TPs - Regions and Climate Change.docx; Briefing Material - 2015 Ozone Transport Rule: Options Selection OAR Pre-Briefing; Draft talkers for Tomas for NTAA call on 10.28.21.docx; 10.28.21 Latest TPs on OAR Activities.docx

Carbonell, Tomas Calendar
Carbonell.Tomas@epa.gov
On Thursday, October 28, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

October 2021

Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	**28**	29	30
31						

Busy
Out of Office
Tentative
Working Elsewhere
Free
Outside of Working Hours

October 2021

Thu, Oct 28

	All Day	ADD Fall Meeting (1 doc - agenda)
	All Day	METHANE RULE ROLLOUT
	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Comms weekly
	10:00 AM – 11:00 AM	2015 Ozone Transport Rule: Options Selection OAR Pre-Briefing (email attachment; includes 2 docs and 1 ppt)
	11:00 AM – 11:30 AM	Provide Remarks at ADD Fall Meeting (1 doc – talkers for Joe)
	11:30 AM – 12:00 PM	**Free**
	12:00 PM – 1:00 PM	Rejoin ADD Fall Meeting: Climate Change Session (1 doc – talkers for Joe)

▨	12:00 PM – 1:30 PM	OECA 2020 Awards Ceremony
☐	**1:30 PM – 2:00 PM**	**Free**
■	2:00 PM – 2:30 PM	NTAA Call (1 doc – talkers for Tomas)
▨	2:00 PM – 2:30 PM	One-on-One with Chris Grundler
☐	**2:30 PM – 3:00 PM**	**Free**
▨	3:00 PM – 4:00 PM	Wildfire Resilience Interagency Working Group Meeting
☐	**4:00 PM – 4:15 PM**	**Free**
■	4:15 PM – 5:00 PM	BC Rescission Final Rule Options Selection (1 doc)
☐	**After 5:00 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 10/28/2021 7:12:04 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
Subject: FW: Paint Strip/Misc Coat NESHAP Preamble Summary
Attachments: SAN8339 FRN 6H Proposal Preamble 19Oct21.ECRMD RMB1_jdf-RLSO.docx

Importance: High

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Iglesias, Amber <Iglesias.Amber@epa.gov>
Sent: Thursday, October 28, 2021 2:30 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Culligan, Kevin <Culligan.Kevin@epa.gov>; Noonan, Jenny <Noonan.Jenny@epa.gov>; Chang, Alice <Chang.Alice@epa.gov>
Subject: Paint Strip/Misc Coat NESHAP Preamble Summary
Importance: High

Ann,

In the email below I included the request from the OP AA and OGC's Response to this request. I also attached comments from OCSPP and our response to those comments in RLSO. Please call me with any questions about this email. Thanks!

OP requested Language:

Ex. 5 Deliberative Process (DP)

OGC Response:

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Amber Iglesias
Office of Air Quality Planning and Standards
1200 Pennsylvania Avenue N.W.
Washington, DC 20004
202-564-3175

Message

From: Kim, Eunjung [Kim.Eun@epa.gov]
Sent: 11/2/2021 10:03:12 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]
Subject: READING: Materials for Wednesday, November 3rd, 2021
Attachments: 2021 11 03 Options Seletion Ozone Transport - Decision Memo.docx; 2021 11 03 Options Seletion Ozone Transport - Slides.pptx; 2021 11 03 Options Seletion Ozone Transport - Briefing Memo.docx; 1 pager on the power sector for Joe's NGO meeting tomorrow

---

Carbonell, Tomas Calendar
Carbonell.Tomas@epa.gov
On Wednesday, November 3, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

November 2021

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Busy | Tentative | Free
Out of Office | Working Elsewhere | Outside of Working Hours

November 2021

Wed, Nov 3

	Before 8:00 AM	**Free**
	8:00 AM – 9:15 AM	**Free**
	9:15 AM – 10:15 AM	Video-call: Options Selection for 2015 Ozone Transport Rule; NPRM (SAN 8670) (2 docs & 1 ppt)
	10:15 AM – 10:40 AM	Management Roundtable
	10:40 AM – 11:30 AM	**Free**
	11:30 AM – 12:00 PM	Air Issues Meeting
	12:00 PM – 1:00 PM	Lunch/Mgmt Time
	12:30 PM – 1:15 PM	NGO Roundtable (1 email)
	1:15 PM – 1:30 PM	**Free**
	1:30 PM – 2:00 PM	General Discussion - COP26

■	2:00 PM – 2:55 PM	Quarterly OAR/RAs/ADDs Call
□	**2:55 PM – 4:30 PM**	**Free**
■	4:30 PM – 5:00 PM	Bi-weekly Oil and Natural Gas (O&G) Sector Meeting
□	**After 5:00 PM**	**Free**

Eunjung Kim
Special Assistant
Office of Air and Radiation
Environmental Protection Agency
(202) 815-7252

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 11/4/2021 3:45:29 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
Subject: FW: Materials for Joe's COP26 Binder
Attachments: 11-2 EPA Methane Rules News Release.docx; 2021-oil-and-gas-proposal.-overview-fact-sheet.pdf; epas-proposed-oil-and-gas-rules.presentation-11.2.2021.pdf; IMEO background for Administrator 07.12.21 tc clean.docx; Global Methane Pledge background.docx; 2021 OAR International Priorities Final Redacted 2-10-21.docx; 01. Annotated for Joe -- COP26 Run of Show draft.docx

These are the materials I received.

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Ferland, Henry <Ferland.Henry@epa.gov>
Sent: Wednesday, November 3, 2021 4:12 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Kim, Eunjung <Kim.Eun@epa.gov>; Shoaff, John <Shoaff.John@epa.gov>; Hockstad, Leif <Hockstad.Leif@epa.gov>
Subject: Materials for Joe's COP26 Binder

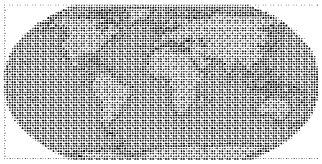
Hey Ann:

Attached is annotated outline for Joe (just updated it again to reflect new material in latest that Brianna just shared

Ex. 5 Deliberative Process (DP)

1) 11/9 -- 1:30 PM event: Preventing Illegal Trade in HFCs (Joe may be moderating – Tomas says they are still working it out)
2) 11/9 -- 6:00 PM event: CCAC Ministerial Meeting with SPEC Kerry and Administrator Regan (discussing Global Methane Pledge)
3) 11/10 -- 12:45 PM event: ZEVTC Ministerial
4) 11/10 -- 3:00 PM event: Decarbonizing Transportation (moderated by Joe)
5) Maybe add Coffee with DOT Secretary Buttigieg (11/11) as also very important (?)

Finally – here's a link to the COP26 main website (just in case): https://unfccc.int/conference/glasgow-climate-change-conference-october-november-2021
I will be around all day tomorrow to help out as needed.



Best,

H

HENRY FERLAND | *INTERNATIONAL COORDINATOR*
U.S. EPA OFFICE OF AIR & RADIATION

Ferland.Henry@epa.gov | 1-202-343-9330

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 11/16/2021 11:46:21 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Hooper, Daniel [hooper.daniel@epa.gov]
Subject: FOR INFORMAL REVIEW: GHGRP Proposed Rule, without Supart I
Attachments: SAN 7230 NPRM Action Memo.docx; SAN 7230 GHGRP NPRM ICR Supporting Statement.docx; SAN 7230 GHGRP NPRM ICR Supporting Statement Attachment 2_Calculations.xlsx; SAN 7230 GHGRP NPRM Assessment of Impacts Memo.docx; SAN 7230 GHGRP NPRM Assessment of Impacts Memo_Appendix B.xlsx; GHGRP Data Quality Improvements Proposal_Fact Sheet.docx; OD Cover Note - GHGRP NPRM to OMB.docx; SAN 7230 Proposed Rule - Full Version.docx; SAN 7230 Index - Full Version.docx; Fw: Subpart I preamble text

Flag: Follow up

Tomás, I believe the other morning you mentioned you were on point for the review of the entire GHGRP package. I've attached here the package I sent to you previously, and have added Subpart I (email attachment at the end). OAP is hoping to get a complete set of OAR IO comments by November 29. They are targeting getting this in to OMB review before the holidays.

Let me know if you have any questions. Thank you!

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Campbell, Ann
Sent: Monday, November 8, 2021 7:29 AM
To: Nunez, Alejandra <Nunez.Alejandra@epa.gov>; Carbonell, Tomas <Carbonell.Tomas@epa.gov>
Cc: Goffman, Joseph <Goffman.Joseph@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Subject: FOR INFORMAL REVIEW: GHGRP Proposed Rule, without Supart I

Tomas, Ale – attached is the GHGRP proposed rule for your review. This is coming to you informally for review. Subpart I has been removed consistent with Ale and Joe's recusal. Tomas, I will therefore get you subpart I under separate cover. No deadline.

Thanks,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 11/22/2021 9:27:56 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Tuesday, November 23
Attachments: November Business Review Materials; RE: November Business Review Materials; FW: Draft for OAR - Draft Proposal: FIP Addressing Regional Ozone Transport for 2015 NAAQS; OAR CC Adaptation Briefing for OAR Senior Management_11-23-21.pptx; OAR Priority Actions_CCAdaptImpPlan_11-23-2021.xlsx

Additional materials: email containing draft preamble of ozone transport rule – review by 11/26

Carbonell, Tomas Calendar
Carbonell.Tomas@epa.gov
On Tuesday, November 23, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

November 2021

Su	Mo	Tu	We	Th	Fr	Sa
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21	22	**23**	24	25	26	27
28	29	30				

Busy | Tentative | Free
Out of Office | Working Elsewhere | Outside of Working Hours

November 2021

Tue, Nov 23

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Comms weekly
	10:00 AM – 10:45 AM	**Free**
	10:45 AM – 11:30 AM	OAR Senior Staff
	11:30 AM – 12:30 PM	Infrastructure Preparedness Planning
	12:30 PM – 1:30 PM	Lunch/Mgmt Time
	1:00 PM – 1:45 PM	AA Level Coordination Meeting on Marine Litter
	1:30 PM – 2:00 PM	OTAQ Weekly
	2:00 PM – 3:00 PM	**Free**

☒	3:00 PM – 4:00 PM	OAR Business Review (2 emails)
☒	4:00 PM – 5:00 PM	OAR Adaptation Implementation Plan (1 ppt and 1 Excel file)
☐	**5:00 PM – 5:30 PM**	**Free**
☒	5:30 PM – 6:00 PM	General Discussion
☐	**After 6:00 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 11/29/2021 10:22:39 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Tuesday, November 30
Attachments: 11.30.1 State AGs.docx; Mayflower GC Scoping comments 20211124.docx; FW: Learning agenda-- OAR benefits item; Update_OAR and TSCA Interface_Goffman_Nov 30 2021_.docx; NewHAPInfrastructureEGBrief.OAR.11.30.2021 (002).docx; Tomas. O&G Public Hearing. Tuesday.docx

Additional materials: Learning Agenda email with attachment and information (deadline for OAR updates to OCFO is Wednesday)

Carbonell, Tomas Calendar
Carbonell.Tomas@epa.gov
On Tuesday, November 30, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

November 2021

Su	Mo	Tu	We	Th	Fr	Sa
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7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Busy | Tentative | Free
Out of Office | Working Elsewhere | Outside of Working Hours

November 2021

Tue, Nov 30

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:15 AM	OAR Senior Staff
	10:15 AM – 10:30 AM	**Free**
	10:30 AM – 11:00 AM	Update on TSCA and CAA Interface (1 word doc)
	11:00 AM – 11:30 AM	HOLD || Oil & Gas Hearing Opening Remarks (1 word doc)
	11:30 AM – 12:30 PM	Infrastructure Preparedness Planning
	12:30 PM – 1:00 PM	Meet and Greet with Joseph Goffman, OAR & R4 RA Daniel Blackman
	12:30 PM – 1:30 PM	Lunch/Mgmt Time

■	1:30 PM – 2:00 PM	OTAQ Weekly
■	2:00 PM – 3:00 PM	General Conformity Applicability to OCS Wind Farm Projects Follow Up (1 word doc)
■	3:00 PM – 4:00 PM	Regulatory Infrastructure for new HAP Additions (1 word doc)
■	4:00 PM – 4:30 PM	OAR/OCIR Bi-Weekly Check-in
■	4:30 PM – 5:30 PM	Meeting with States re: Section 111 rulemakings (1 word doc)
■	5:30 PM – 6:15 PM	General Discussion
□	**After 6:15 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 11/30/2021 10:37:33 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Wednesday, December 1
Attachments: Tomas. O&G Public Hearing. Wednesday.docx; Pre-EG Coke-Ovens-OAR-12-1-2021.docx

Carbonell, Tomas Calendar
Carbonell.Tomas@epa.gov
On Wednesday, December 1, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Busy | Tentative | Free
Out of Office | Working Elsewhere | Outside of Working Hours

December 2021

Wed, Dec 1

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Air Issues Meeting
	10:00 AM – 10:45 AM	Pre-Early Guidance: Coke Ovens RTR Proposed Rules (Tier 2, SAN 8471) (1 word doc)
	10:45 AM – 10:50 AM	**Free**
	10:50 AM – 11:30 AM	Oil & Gas Hearing Opening Remarks (1 word doc)
	11:30 AM – 12:00 PM	**Free**
	12:00 PM – 1:00 PM	Lunch/Mgmt Time
	1:00 PM – 1:30 PM	Meeting with Southern Company re: GHG Regulations for the Electric Utility Sector Under Clean Air Act Section 111 (OAQPS to send tomorrow morning)
	1:30 PM – 2:00 PM	One-on-One with Chris Grundler

☐	**2:00 PM – 3:00 PM**	**Free**
■	3:00 PM – 4:00 PM	NVFEL@50 event
☐	**4:00 PM – 4:30 PM**	**Free**
☐	**After 4:30 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/1/2021 11:07:58 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Thursday, December 2
Attachments: REVIEW - Administrator Materials for Power Plant Strategy Outreach; Tomas. OG Public Hearing. Thusday.docx; REVIEW - Administrator EtO Materials

Additional materials: Power plant strategy Administrator briefing (email) - Feedback needed by 9 am tomorrow (Thursday)

Carbonell, Tomas Calendar
Carbonell.Tomas@epa.gov
On Thursday, December 2, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

Su	Mo	Tu	We	Th	Fr	Sa
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Busy
Out of Office
Tentative
Working Elsewhere
Free
Outside of Working Hours

December 2021

Thu, Dec 2

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Comms weekly
	10:00 AM – 11:00 AM	EnergyInnovates: Methane
	10:00 AM – 11:00 AM	Speaking Engagement: Energy Innovates: Methane—Tackling that 'Other' Gas (comms to send)
	10:50 AM – 11:30 AM	Oil & Gas Hearing, Opening Remarks (1 word doc)
	11:30 AM – 12:00 PM	Pre-Meet for External SJV Meeting with EarthJustice
	12:00 PM – 1:00 PM	FW: Sub-IPC on Climate Cooperation
	1:00 PM – 1:30 PM	Scheduling Meeting

☐	**1:30 PM – 2:00 PM**	**Free**
■	2:00 PM – 2:30 PM	Pre-brief for GMP Call with State Department
☐	**2:30 PM – 3:00 PM**	**Free**
▨	3:00 PM – 3:30 PM	Prep for EtO Congressional Briefing (1 email)
■	3:30 PM – 4:00 PM	OAR Meet & Greet with Lisa Garcia Region 2
▨	4:00 PM – 5:00 PM	Tomas-Susannah
☐	**After 5:00 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/3/2021 9:19:57 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Monday, December 6
Attachments: 2021 12 06 Pre-Brief for EtO Congressional Caucus Meeting - Briefing Memo FINAL.docx; OAR OP Monthly_120621.final annotated.docx; 2021 12 06 Pre-Brief for EtO Congressional Caucus Meeting - Slides.pptx

Carbonell, Tomas Calendar
Carbonell.Tomas@epa.gov
On Monday, December 6, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

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Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

December 2021

Mon, Dec 6

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Prep for EtO Congressional Caucus Prebrief (OCIR to send Monday)
	9:30 AM – 10:00 AM	**Free**
	10:00 AM – 10:30 AM	Management Roundtable
	10:30 AM – 11:00 AM	Air Issues Meeting
	11:00 AM – 11:30 AM	**Free**
	11:30 AM – 12:00 PM	OAQPS Weekly
	12:00 PM – 1:00 PM	Lunch/Mgmt Time
	1:00 PM – 2:00 PM	**Free**
	2:00 PM – 2:30 PM	Video-call: Briefing: EtO Caucus (1 word doc, 1 ppt)
	2:00 PM – 3:00 PM	Senior Staff Meeting

▨	3:00 PM – 3:30 PM	OAP Weekly
☐	**3:30 PM – 4:00 PM**	**Free**
■	4:00 PM – 5:00 PM	Management Time
■	5:00 PM – 5:30 PM	OAR/OP Monthly Meeting (1 word file)
☐	**After 5:30 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/6/2021 10:17:11 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Tuesday, December 7
Attachments: Points/background for COP26 Sync, Tues. 12/7 @ 11 AM; The Future of Nuclear Energy 20211207.1.pptx; REVIEW: Feedback on OGC/OLEM TA on Sen. Markey staff TA Request: Natural Gas Blowout Prevention, Oversight, and Liability Act; FW: Dieu, Martin shared "2021 12 07 COP26 Sync - AMR Remarks" with you.; for Continuous Improvement briefing 3pm Tuesday 12/7; SJV EarthJustice Prep Pager_12.1.21.docx

Additional materials: Feedback on OGC/OLEM TA on Senator Markey bill (1 email attached)

Carbonell, Tomas Calendar
Carbonell.Tomas@epa.gov
On Tuesday, December 7, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

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Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

December 2021

Tue, Dec 7

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:30 AM	**Free**
	10:30 AM – 11:00 AM	OAR Senior Staff
	11:00 AM – 11:30 AM	Video-call: COP26 Sync (2 emails)
	11:30 AM – 12:00 PM	The future of the Nuclear Energy (1 ppt)
	12:00 PM – 1:00 PM	Infrastructure Preparedness Planning
	1:00 PM – 1:30 PM	**Free**
	1:30 PM – 2:00 PM	OTAQ Weekly

☐	**2:00 PM – 4:00 PM**	**Free**
☒	4:00 PM – 4:45 PM	Continuous Improvement Briefing (1 email)
☐	**4:45 PM – 5:00 PM**	**Free**
☒	5:00 PM – 6:30 PM	Meeting with EarthJustice re: PM 2.5 (1 word doc – same one from Friday used for pre-brief)
☒	6:30 PM – 7:15 PM	General Discussion
☐	**After 7:15 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Joe,

Attached for your review is the final rule titled National Emission Standards for Hazardous Air Pollutants (NESHAP): Mercury Cell Chlor-Alkali Plants Residual Risk and Technology Review (RTR). This is a Tier 2 action and has been determined to be a "significant" regulatory action. The final rule has a court-ordered deadline of May 2, 2022.

There were two facilities (Ashta located in Ohio, and Westlake located in West Virginia) subject to the NESHAP when we started this RTR. However, the Ashta facility recently converted to a non-mercury process. Therefore, only one facility (Westlake) remains subject to the NESHAP.

This action finalizes the Mercury Cell Chlor-Alkali Plants RTR and the beyond-the-floor determination that was performed in response to NRDC's 2004 petition for reconsideration.

These final amendments:

Ex. 5 Deliberative Process (DP)

Thank you and feel free to call me if you want to discuss or would like more information.

Penny Lassiter, (919) 541-5396
Director, Sector Policies and Programs Division (OAQPS)

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 12/7/2021 7:47:29 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Hooper, Daniel [hooper.daniel@epa.gov]
Subject: FOR YOUR REVIEW - Implementing Regulations under 40 CFR Part 60 Subpart Ba Adoption and Submittal of State Plans for Designated Facilities for OMB review
Attachments: 3_Subpart Ba Draft Comm Plan.SPPD .docx; 4_Subpart Ba Draft Fact Sheet.docx; 2_Action Memo_Subpart Ba 12.3.21_DRAFT.docx; EO12866_2060_AV48_EPA_6_b_RLSO Subpart Ba Reg Text.docx; EO12866_2060-AV48_EPA_Implementing Regulations Subpart Ba_120621.docx; 1_Subpart Ba Draft Post-It Note.docx

Importance: High
Flag: Follow up

Tomas, the attached is ready for your review and concurrence to initiate OMB review. This is the third package I've sent to you and I have one more coming today, in addition to Primary Copper and the FFS which will both take priority. Let me know if you'd like to redistribute the workload.

Thank you,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Morgan, Ruthw <morgan.ruthw@epa.gov>
Sent: Tuesday, December 7, 2021 10:52 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Cc: Lubetsky, Jonathan <Lubetsky.Jonathan@epa.gov>; Sandfoss, Kristina <Sandfoss.Kristina@epa.gov>; Mcquilkin, Wendy <Mcquilkin.Wendy@epa.gov>; OAQPSREGPROCESSING <OAQPSREGPROCESSING@epa.gov>; Iglesias, Amber <Iglesias.Amber@epa.gov>; Culligan, Kevin <Culligan.Kevin@epa.gov>; Chang, Alice <Chang.Alice@epa.gov>; Morgan, Ruthw <morgan.ruthw@epa.gov>; Noonan, Jenny <Noonan.Jenny@epa.gov>
Subject: (SAN 8606) - Implementing Regulations under 40 CFR Part 60 Subpart Ba Adoption and Submittal of State Plans for Designated Facilities for OMB review
Importance: High

SAN 8606 - OMB

TO: THE IMMEDIATE OFFICE FOR REVIEW AND TRANSMITTAL FOR OMB

Attached is the OMB package for Implementing Regulations under 40 CFR Part 60 Subpart Ba Adoption and Submittal of State Plans for Designated Facilities (SAN 8606)

This is a tier 2 "Significant" action with a signature date of 1/31/2022. While not under a court ordered deadline, these amendments will replace timelines vacated by the D.C. Circuit Court in January 2021. The timelines and additional modifications, if finalized, will apply to any emission guideline (EG) promulgated under Clean Air Act section 111(d) after July 8, 2019. It is urgent that OMB Receive this package prior to the 12/17/2021 deadline to upload new projects into ROCIS. Thank you!

POC: Amber Iglesias
202-564-3175

Thanks!

Ruthw Morgan - 202 564-1326

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 12/6/2021 10:44:39 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Hooper, Daniel [hooper.daniel@epa.gov]
Subject: FOR YOUR CONCURRENCE: GHGRP Proposed Rule
Attachments: OD Cover Note - GHGRP NPRM to OMB.docx; SAN 7230 Proposed Rule - Full Version_CLEAN.docx; SAN 7230 Proposed Rule - Full Version_RLSO.docx; SAN 7230 Proposed Rule - Redacted Version_RLSO.docx; SAN 7230 GHGRP NPRM Assessment of Impacts Memo.docx; SAN 7230 GHGRP NPRM Assessment of Impacts Memo_Appendix B.xlsx; SAN 7230 GHGRP NPRM ICR Supporting Statement.docx; SAN 7230 GHGRP NPRM ICR Supporting Statement Attachment 2_Calculations.xlsx; SAN 7230 NPRM Action Memo.docx; GHGRP Data Quality Improvements Proposal_Fact Sheet.docx

Flag: Follow up

Tomas, the attached is ready for your re-review and concurrence to send to OP to initiate OMB review. As a remainder, Ale and Joe are recused from a portion of this rulemaking (Subpart I) and, as such, you will need to concur with moving it forward. There is no timeframe associated with the proposal but we must have the final completed by Nov, 2022 and this is being sent to OMB for a 90 day review so the program is eager to initiate review.

Thank you,

Ann (Campbell) Ferrio
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Mcquilkin, Wendy <Mcquilkin.Wendy@epa.gov>
Sent: Monday, December 6, 2021 5:23 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>; Hooper, Daniel <hooper.daniel@epa.gov>
Cc: OAPREGPROCESSING <OAPREGPROCESSING@epa.gov>; Schmeltz, Rachel <Schmeltz.Rachel@epa.gov>; DeFigueiredo, Mark <DeFigueiredo.Mark@epa.gov>; Bohman, Jennifer <Bohman.Jennifer@epa.gov>; Banks, Julius <Banks.Julius@epa.gov>; Kocchi, Suzanne <Kocchi.Suzanne@epa.gov>; Gunning, Paul <Gunning.Paul@epa.gov>
Subject: SAN 7230 GHGRP Proposed Rule

SAN 7239 NPRM

ICR#2300.19 OMB CONTROL # 2060-0629

TO: THE IMMEDIATE OFFICE FOR REVIEW AND TRANSMITTAL TO OMB.

Attached for the NPRM for **Revisions and Confidentiality Determinations for Data Elements under the Greenhouse Gas Reporting Rule (SAN 7230; RIN 2060-AU35)** for OAR-IO review and transmittal to OMB. We have addressed all of Tomas and Ale's comments and included a RLSO version as well.

- OD Cover Note
- Proposed Rule:
  - Clean copy of the complete file (File name = SAN 7230 Proposed Rule - Full Version_CLEAN)
  - Redline copy of the complete file (File name = SAN 7230 Proposed Rule - Full Version_RLSO)
  - Redline of the redacted file (File name = SAN 7230 Proposed Rule - Redacted Version_RLSO)

- ICR Supporting Statement
- ICR Supporting Statement - Attachment 2
- Assessment of Impacts Memo
- Assessment of Impacts Memo - Appendix B
- Action Memo
- Fact Sheet

POC: Patrick Lau
202-564-7312

Wendy

Wendy McQuilkin
USEPA - OAR/OAPPS
1200 Pennsylvania Ave, NW
Washington, DC 20460
Rm 5442S WJC North – MC 6103A
(202) 564-1348
Prejudice is a burden that confuses the past, threatens the future and renders the present inaccessible – Dr. Maya Angelou

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/7/2021 11:09:31 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Wednesday, December 8
Attachments: CAAAC background for Air Issues Wed. 12/8 @ 9:30; RE: Memo deadline today; power-plant-standards-letter-20210406.pdf; FW: AA briefing materials on SNAP Remand Rule; Administrator Visit Briefing Memo, Slide Deck, and Attendee list

Additional materials: Administrator RTP trip briefing memo and slides (email) – due to AO by 3 pm tomorrow (Wednesday)

Carbonell, Tomas Calendar
Carbonell.Tomas@epa.gov
On Wednesday, December 8, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

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Busy | Tentative | Free
Out of Office | Working Elsewhere | Outside of Working Hours

December 2021

Wed, Dec 8

	Before 7:30 AM	**Free**
	7:30 AM – 8:30 AM	GMI Steering Leadership Meeting
	8:30 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Air Issues Meeting (1 email)
	10:00 AM – 10:45 AM	**Free**
	10:45 AM – 11:15 AM	Remarks: Meeting with the House Ethylene Oxide Caucus (1 email)
	11:15 AM – 1:00 PM	**Free**
	1:00 PM – 2:00 PM	GHG Roundtable (1 pdf; power plant standards letter)
	2:00 PM – 3:00 PM	Significant New Alternatives Policy (SNAP) Remand Rule (1 email)

■	3:00 PM – 3:30 PM	Meeting with Nicholas Institute for Environmental Policy Solutions re: Oil and Natural Gas Sector Climate Review
■	3:30 PM – 4:30 PM	Bi-weekly Oil and Natural Gas (O&G) Sector Meeting
■	4:30 PM – 5:00 PM	EJ Legal Tools Follow Up
■	5:00 PM – 6:00 PM	Wyoming Regional Haze Mediation
□	**After 6:00 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/8/2021 9:52:01 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Thursday, December 9
Attachments: Pre-EG Part 2-Coke-Ovens-RTR-OAR-12-9-2021 V2.docx; LAB_Manufacturing OAR.12.09.2021.docx; 12.7.21 Carbonell ECOS Webinar OGrule v2.docx

Carbonell, Tomas Calendar
Carbonell.Tomas@epa.gov
On Thursday, December 9, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

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Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

December 2021

Thu, Dec 9

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Comms weekly
	10:00 AM – 11:00 AM	**Free**
	11:00 AM – 12:00 PM	Pre-Early Guidance: Coke Ovens RTR Proposed Rules – Part 2 (Tier 2, SAN 8471) (1 word doc)
	12:00 PM – 12:30 PM	**Free**
	12:30 PM – 1:00 PM	Phone-call: Governor Mark Gordon, WY
	1:00 PM – 2:00 PM	Decisional Briefing for Lead Acid Battery Manufacturing NESHAP and NSPS review proposals (Tier 3, SAN 8602 and 8603) (1 word doc)
	2:00 PM – 2:30 PM	Light-Duty Vehicles Update

▨	2:00 PM – 3:15 PM	ECOS O&GC Webinar: U.S. EPA Methane Rulemaking & Orphan Well Challenges & Solutions (1 word doc)
▨	2:30 PM – 3:00 PM	OTAQ Weekly
▨	3:00 PM – 3:30 PM	Scheduling Meeting
▨	3:30 PM – 4:00 PM	One-on-One with Chris Grundler
■	4:00 PM – 4:30 PM	Cookstoves-Household Energy Discussion
■	4:30 PM – 5:00 PM	Management Time
□	**After 5:00 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/9/2021 10:47:48 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Friday, December 10
Attachments: Climate and EJ Block Grants Initial Scoping Discussion; FW: Comms materials for Seasonality and Climate Change report; FW: Communications Guidance: Fall Regulatory Agenda; Briefing memo Risk from Total Air Toxics Identifcation and Solutions.docx; Total_Air_Exposure_Ax briefing_120221r.pptx; Limtree issue paper_12-7-21.docx

Additional materials:

(1) Comms materials for Seasonality and Climate Change report (email);

(2) Communications Guidance: Fall Regulatory Agenda (email);

Carbonell, Tomas Calendar
Carbonell.Tomas@epa.gov
On Friday, December 10, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

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Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

December 2021

Fri, Dec 10

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 10:30 AM	Video-call: EJ and Air Toxics Regulations (1 word doc, 1 ppt)
	10:30 AM – 11:00 AM	**Free**
	11:00 AM – 11:30 AM	Introductory Meeting w/ Tomás Carbonell
	11:30 AM – 12:00 PM	Aligning on GMP with Julie (DoE)
	12:00 PM – 1:00 PM	Lunch/Mgmt Time
	12:00 PM – 3:00 PM	DO NOT SCHEDULE - READING

■	3:00 PM – 4:00 PM	Climate and EJ Block Grants Initial Scoping Discussion (1 email)
□	**4:00 PM – 4:15 PM**	**Free**
■	4:15 PM – 5:15 PM	Video-call: Limetree Bay Briefing, Region 2 (1 word doc)
■	5:15 PM – 6:00 PM	General Discussion
□	**After 6:00 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 12/14/2021 1:23:47 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Hooper, Daniel [hooper.daniel@epa.gov]
Subject: FOR YOUR REVIEW: NPRM Primary Copper SAN 7522
Attachments: 4_Draft Fact Sheet_PrimaryCopperRTR_Proposal 12-09-2022.docx; 5_FW_ OGC concurrence for signature of Primary Copper Proposed rule.pdf; 11.22 Typesetting request for Primary Copper Smelting RTR.pdf; 3_Primary Cu DRAFT Comm Plan 12-1-2021-clean.docx; NPRM Primary Copper Action Memo on Letterhead.doc

Flag: Follow up

Tomas, the attached proposal is ready for your review. As you know, the final is currently court ordered for April.

Thank you,

Ann (Campbell) Ferrio
Chief of Staff
Office of Air and Radiation
(202) 566-1370

Begin forwarded message:

From: "Morgan, Ruthw" <morgan.ruthw@epa.gov>
Date: December 14, 2021 at 8:12:40 AM EST
To: "Campbell, Ann" <Campbell.Ann@epa.gov>, "Hooper, Daniel" <hooper.daniel@epa.gov>
Cc: OAQPSREGPROCESSING <OAQPSREGPROCESSING@epa.gov>, "Lubetsky, Jonathan" <Lubetsky.Jonathan@epa.gov>, "Mcquilkin, Wendy" <Mcquilkin.Wendy@epa.gov>, "Olson, Heather" <Olson.Heather@epa.gov>, "Morgan, Ruthw" <morgan.ruthw@epa.gov>, "Iglesias, Amber" <Iglesias.Amber@epa.gov>, "Culligan, Kevin" <Culligan.Kevin@epa.gov>, "Chang, Alice" <Chang.Alice@epa.gov>
Subject: For Signature: NPRM Primary Copper SAN 7522

To: Immediate Office for review on signature package.

Attached is the signature package for the proposed National Emission Standards for Hazardous Air Pollutants: Primary Copper Smelting Residual Risk and Technology Review and Primary Copper Smelting Area Source Technology Review (SAN 7522). I will have a CMS number shortly and will send when available. This package has a consent decree of 4/1/2022 for the final action.

POC: Amber Iglesias
202-564-3175

Thanks!

Ruthw Morgan – 202 564-1326

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/10/2021 9:53:26 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Monday, December 13
Attachments: Coke-Ovens-RTR-EG-OAR-12-13-2021 (003).docx; FOR YOUR INFORMAL REVIEW -GHG White Paper; For Weekend reading folders & review/comment by OOB Mon. 1) Cumulative Impacts White Paper & 2) NALS Action Plan

Additional Materials: ORD Cumulative impacts White Paper, and NALS Action Plan (1 email)

Carbonell, Tomas Calendar
Carbonell.Tomas@epa.gov
On Monday, December 13, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

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Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

December 2021

Mon, Dec 13

	Before 8:00 AM	**Free**
	8:00 AM – 8:30 AM	**Free**
	8:30 AM – 9:00 AM	Scheduling Meeting
	9:00 AM – 9:30 AM	Management Roundtable
	9:30 AM – 10:00 AM	Air Issues Meeting
	10:00 AM – 10:30 AM	OAP Weekly
	10:30 AM – 11:30 AM	Early Guidance: Coke Ovens RTR Proposed Rules (Tier 2, SAN 8471) (1 word doc)
	11:30 AM – 12:00 PM	OAQPS Weekly
	12:00 PM – 1:00 PM	**Free**
	1:00 PM – 2:00 PM	Methane Small Group - Aligning on GMP
	2:00 PM – 3:00 PM	Senior Staff Meeting
	3:00 PM – 3:15 PM	**Free**

☒	3:15 PM – 5:00 PM	Hatch Act Training for EPA Political Appointees
☒	5:00 PM – 5:45 PM	Informational White Paper on GHG Mitigation Options for New Combustion Turbine EGUs (1 email)
☐	**After 5:45 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
Office of Air and Radiation, US EPA
hooper.daniel@epa.gov
202.343.9167 office

Pronouns: He/Him/His

Message

From: Hooper, Daniel [hooper.daniel@epa.gov]
Sent: 12/13/2021 10:42:21 PM
To: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
CC: Campbell, Ann [Campbell.Ann@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]
Subject: READING: Materials for Tuesday, December 14
Attachments: December Business Review Materials; The Future of Nuclear Energy 20211207.1.pptx; 2021 12 14 OAR Outreach on Climate Rules for the Power Sector - Slides.pptx; 2021 12 14 OAR Outreach on Climate Rules for the Power Sector - Briefing Memo 2.0.docx; LAB_Manufacturing OAR.12.14.2021.docx

Carbonell, Tomas Calendar
Carbonell.Tomas@epa.gov
On Tuesday, December 14, 2021
Time zone: (UTC-05:00) Eastern Time (US & Canada)
(Adjusted for Daylight Saving Time)

December 2021

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Busy — Tentative — Free
Out of Office — Working Elsewhere — Outside of Working Hours

December 2021

Tue, Dec 14

	Before 8:00 AM	**Free**
	8:00 AM – 9:00 AM	**Free**
	9:00 AM – 9:30 AM	Management Roundtable
	9:00 AM – 10:00 AM	Hold for GMP methane data call
	9:30 AM – 10:15 AM	OAR Senior Staff
	10:15 AM – 11:00 AM	Decisional Briefing for Lead Acid Battery Manufacturing NESHAP and NSPS review proposals (Tier 3, SAN 8602 and 8603) (1 word doc)
	11:00 AM – 12:00 PM	Infrastructure Preparedness Planning
	12:00 PM – 12:30 PM	OTAQ Weekly
	12:30 PM – 1:00 PM	**Free**
	1:00 PM – 1:30 PM	Pre-brief Call Sen. Capito's Staff

☐	**1:30 PM – 2:00 PM**	**Free**
▨	2:00 PM – 3:00 PM	OAR Business Review (1 email)
☐	**3:00 PM – 3:30 PM**	**Free**
▨	3:30 PM – 4:00 PM	The future of the Nuclear Energy (1 ppt)
■	4:00 PM – 5:00 PM	Video-call: Outreach on Climate Rules for the Power Sector (1 word doc, 1 ppt)
▨	5:00 PM – 5:45 PM	San Joaquin Valley PM2.5 Small Check-in
▨	5:45 PM – 6:15 PM	General Discussion
☐	**After 6:15 PM**	**Free**

Daniel Hooper
Assistant Chief of Staff
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Pronouns: He/Him/His

Message

From: Childers, Pat [Childers.Pat@epa.gov]
Sent: 12/20/2021 8:16:27 PM
To: Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Shaw, Betsy [Shaw.Betsy@epa.gov]; Shoaff, John [Shoaff.John@epa.gov]
Subject: FW: Region 5 Tribal Air Resources Journal 2021 release of publication for 2021 - 13th edition
Attachments: Tribal Air Resources Journal for R5 Tribes 13th Edition 2021.pdf

Happy Holidays,

In case you didn't get this report from Brandy. It is a great compilation of some wonderful Tribal air efforts in region 5.

Pat

From: Brandy Toft <brandy.toft@llojibwe.net>
Sent: Monday, December 20, 2021 1:57 PM
To: Tsirigotis, Peter <Tsirigotis.Peter@epa.gov>; Koerber, Mike <Koerber.Mike@epa.gov>; Wayland, Richard <Wayland.Richard@epa.gov>; Mathias, Scott <Mathias.Scott@epa.gov>; Sasser, Erika <Sasser.Erika@epa.gov>; Wood, Anna <Wood.Anna@epa.gov>; Lassiter, Penny <Lassiter.Penny@epa.gov>; Colon, Toni <Colon.Toni@epa.gov>; Payne, JamesJ <payne.jamesj@epa.gov>; Bollerud, Erica <Bollerud.Erica@epa.gov>; Wilson, Holly <Wilson.Holly@epa.gov>; Chappell, Regina <Chappell.Regina@epa.gov>; Veal, Lee <Veal.Lee@epa.gov>; Ndoh, Tina <Ndoh.Tina@epa.gov>
Cc: Childers, Pat <Childers.Pat@epa.gov>; Robin Bouschor <rbouschor1@saulttribe.net>
Subject: Region 5 Tribal Air Resources Journal 2021 release of publication for 2021 - 13th edition

We, the Tribes of EPA Region 5 (Minnesota, Wisconsin, Michigan), would like to share with you the 2021 Edition of the ***Tribal Air Resources Journal, Volume 13***. The Tribes in Region 5 have compiled this Journal since 2008 to promote our air achievements and successes, and share obstacles and setbacks encountered in their Tribal communities and air resources. This year, and last, proved to be a year of testing many Tribes' resolve and in this Journal some Tribes address how COVID has impacted their Programs.

In this Journal each Region 5 Tribes has laid out a one-page summary on those issues. Each Tribal entry reflects the unique nature of Tribes in Region 5 and the different issues, priorities, size of departments and funding concerns faced by each.

Included in the Journal is a summary of facts for Region 5 Tribal funding and involvement on regional and national venues. Located at the end of the Journal you will find Region 5 Tribal location map and contact listings for Tribal air professionals for ease of networking. On the back cover you will find a map of the Ceded Territories for Minnesota, Wisconsin and Michigan. The overall goal of the Journal is to inform and communicate potential partnerships as well as leverage resources for Region 5 Tribes now and into the future.

Please share this Region 5 ***Tribal Air Resources Journal*** with *all* whom you think would be interested and gain information from. Each year this Journal improves to better communicate to assist and educate the reader on air quality in Indian Country. We all face and address unique air quality challenges and priorities even though on 15 out of our 35 Tribes have some form of CAA funded Air Programs. Air concerns do not cease with a decrease or lack of funding and to an extent have been exacerbated by COVID.

Please send any correspondence on how the Journal enlightened or assisted you in understanding our air issues and successes. We also welcome any suggestions for ideas or improvements that can be made to Brandy or Robin at the information below. We apologize for any cross postings.

Migwetch!
Brandy and Robin

Brandy Toft
Interim Environmental Director
Leech Lake Band of Ojibwe
218.760.1672 (c)
218.335.7429 (o)
Brandy.Toft@llojibwe.net (note "Udrm.org" and "llojibwe.org" emails are invalid)

Robin Bouschor
Environmental Specialist
Sault Ste. Marie Tribe of Chippewa Indians
906-632-5575
RBouschor1@saulttribe.net

Appointment

From: Stewart, Lakita [Stewart.Lakita@epa.gov]
Sent: 1/4/2022 8:22:15 PM
To: Freedhoff, Michal [Freedhoff.Michal@epa.gov]; Goffman, Joseph [Goffman.Joseph@epa.gov]; Waterhouse, Carlton [Waterhouse.Carlton@epa.gov]; Breen, Barry [Breen.Barry@epa.gov]; Fox, Radhika [Fox.Radhika@epa.gov]; Frey, Christopher [Frey.Christopher@epa.gov]; Cascio, Wayne [Cascio.Wayne@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Prieto, Jeffrey [Prieto.Jeffrey@epa.gov]; Hoffer, Melissa [Hoffer.Melissa@epa.gov]; Bermudez, Navis [Bermudez.Navis@epa.gov]
CC: Arroyo, Victoria [Arroyo.Victoria@epa.gov]; Hoskinson, Carolyn [Hoskinson.Carolyn@epa.gov]; Almodovar, Paul [Almodovar.Paul@epa.gov]; Lowrey, Daniel [Lowrey.Daniel@epa.gov]; Kasman, Mark [Kasman.Mark@epa.gov]; Kovner, Karissa [Kovner.Karissa@epa.gov]; Keating, Terry [Keating.Terry@epa.gov]; Berns, Anne [Berns.Anne@epa.gov]; Hilosky, Nick [Hilosky.Nick@epa.gov]; Brooks, Becky [Brooks.Becky@epa.gov]; Goldberg, Ruby [Goldberg.Ruby@epa.gov]; Sims, JaniceHQ [Sims.JaniceHQ@epa.gov]; Civic, Melanne [Civic.Melanne@epa.gov]; Crossland, Andy [Crossland.Andy@epa.gov]; Ankrah, Rodges [Ankrah.Rodges@epa.gov]; Marzouk, Evonne [Marzouk.Evonne@epa.gov]; Vauter, Ben [Vauter.Ben@epa.gov]; Finman, Hodayah [Finman.Hodayah@epa.gov]; Kirkland, Kim [Kirkland.Kim@epa.gov]; Adrian, Stephanie [Adrian.Stephanie@epa.gov]; Yohannes, Lia [Yohannes.Lia@epa.gov]; Hackel, Angela [Hackel.Angela@epa.gov]

Subject: AA Level Coordination Meeting on Minamata Convention on Mercury
Attachments: Agenda for AA-Level Briefing 12-14-21.docx; Mercury Briefing Background Paper.docx; EPA Accredited Delegates to COP 4-1.docx
Location: Microsoft Teams Meeting

Start: 1/6/2022 6:00:00 PM
End: 1/6/2022 7:00:00 PM
Show Time As: Tentative

Required Attendees: Freedhoff, Michal; Goffman, Joseph; Waterhouse, Carlton; Breen, Barry; Fox, Radhika; Frey, Christopher; Cascio, Wayne; Carbonell, Tomas; Prieto, Jeffrey; Hoffer, Melissa; Bermudez, Navis
Optional Attendees: Arroyo, Victoria; Hoskinson, Carolyn; Almodovar, Paul; Lowrey, Daniel; Mark Kasman; Kovner, Karissa; Keating, Terry; Berns, Anne; Hilosky, Nick; Brooks, Becky; Goldberg, Ruby; Sims, JaniceHQ; Civic, Melanne; Crossland, Andy; Ankrah, Rodges; Marzouk, Evonne; Vauter, Ben; Hodayah Finman; Kirkland, Kim; Adrian, Stephanie; Lia Yohannes; Hackel, Angela

Meeting materials are attached. Contact Martin Dieu with questions.

Microsoft Teams meeting

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Ex. 5 Deliberative Process (DP) United States, Washington DC
Phone Conference ID Ex. 5 Deliberative Process (DP) #
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Message

From: Carbonell, Tomas [Carbonell.Tomas@epa.gov]
Sent: 11/10/2021 10:10:27 PM
To: DeLuca, Isabel [DeLuca.Isabel@epa.gov]

Hi Isabel, I got a VM from Sean Reilly asking questions about MATS. Can I give you a quick ring after this?

Appointment

From: Goffman, Joseph [Goffman.Joseph@epa.gov]
Sent: 1/3/2022 2:53:26 PM
To: Goffman, Joseph [Goffman.Joseph@epa.gov]; Profeta, Timothy [Profeta.Timothy@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Culligan, Kevin [Culligan.Kevin@epa.gov]; Birnbaum, Rona [Birnbaum.Rona@epa.gov]

Subject: HOLD || APPA
Attachments: APPA_12022021_ External meeting requests pdf.pdf
Location: TBD

Start: 1/14/2022 4:00:00 PM
End: 1/14/2022 4:30:00 PM
Show Time As: Tentative

Required Attendees: Profeta, Timothy; Carbonell, Tomas; Culligan, Kevin; Birnbaum, Rona

APPA_12022021_
External meeting...