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6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 63

[EPA-HQ-OAR-2023-0282; FRL-10854-01-OAR]

RIN 2060-AW01

Review of National Emission Standards for Hazardous Air Pollutants for Polyether Polyols Production Industry

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The U.S. Environmental Protection Agency (EPA) is proposing amendments to the National Emission Standards for Hazardous Air Pollutants (NESHAP) under the Clean Air Act (CAA) that apply to the Polyether Polyols (PEPO) Production industry (referred to as the PEPO NESHAP in this document). The EPA is proposing decisions resulting from the Agency's technology review of the PEPO NESHAP and decisions based on its reconsideration of certain issues raised in an administrative petition for reconsideration. Furthermore, the EPA is proposing to strengthen the emission standards for ethylene oxide (EtO) emissions after considering the results of a risk assessment for the PEPO NESHAP. The EPA is also proposing to require performance testing once every 5 years, to add work practice standards for certain activities where alternatives are appropriate, and to add provisions for electronic reporting. We estimate that the proposed amendments to the PEPO NESHAP, excluding the EtO emission standards, would reduce hazardous air pollutant (HAP) emissions from PEPO sources by approximately 157 tons per year (tpy). Additionally, the proposed EtO emission standards are expected to reduce EtO emissions by approximately 14 tpy. We also estimate that these proposed amendments to the NESHAP will reduce excess emissions of HAP from flares in the PEPO Production source category by an additional 75 tpy.

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. If anyone contacts us requesting a public hearing on or before January 3, 2025, 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-2023-0282, 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-2023-0282 in the subject line of the message.
- Fax: 202-566-9744. Attention Docket ID No. EPA-HQ-OAR-2023-0282.
- Mail: U.S. Environmental Protection Agency, EPA Docket Center, Docket ID No. EPA-HQ-OAR-2023-0282, 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 **SUPPLEMENTARY INFORMATION** section of this document.

FOR FURTHER INFORMATION CONTACT: For questions about this proposed action, contact U.S. EPA, Attn: Ms. Johanna Klein, Mail Drop: E143-01, 109 T.W. Alexander Drive, P.O. Box 12055, Research Triangle Park, North Carolina 27711; telephone number: (919) 541-2283; and email address: *klein.johanna@epa.gov*. For specific information regarding the risk modeling methodology, contact U.S. EPA, Attn: Ms. Dianna Francisco, Mail Drop: C539-02, 109 T.W. Alexander Drive, P.O. Box 12055, Research Triangle Park, North Carolina 27711; telephone number: (919) 541-3182; and email address: *francisco.dianna@epa.gov*.

SUPPLEMENTARY INFORMATION:

Participation in virtual public hearing. 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 hearing will be held via virtual platform. The EPA will announce the date of the hearing and further details on the virtual public hearing at *https://www.epa.gov/stationary-sources-air-pollution/polyether-polyols-production-national-emission-standards-hazardous*. The hearing will convene at 11:00 a.m. Eastern Time (ET) and will conclude at 4:00 p.m. ET. The EPA may close a session 15 minutes after the last pre-registered speaker has testified if there are not additional speakers.

The EPA will begin pre-registering speakers for the hearing no later than 1 business day after a request has been received. To register to speak at the virtual hearing, please use the online registration form available at *https://www.epa.gov/stationary-sources-air-pollution/polyether-polyols-production-national-emission-standards-hazardous* 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 **January 13, 2025**. Prior to the hearing, the EPA will post a general agenda that will list pre-registered speakers at: *https://www.epa.gov/stationary-sources-air-pollution/polyether-polyols-production-national-emission-standards-hazardous.*

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 4 minutes to provide oral testimony. The EPA encourages commenters to submit a copy of their 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/polyether-polyols-production-national-emission-standards-hazardous*. While the EPA expects the hearing to go forward as set forth above, please monitor these websites 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 a special accommodation such as audio description, please pre-register for the hearing with the public hearing team and describe your needs by **January 7, 2025**. The EPA may not be able to arrange accommodations without advance notice.

Docket. The EPA has established a docket for this rulemaking under Docket ID No. EPA-HQ-OAR-2023-0282. 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-2023-0282. 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 to *https://www.regulations.gov* any information that you consider to be CBI or other information whose disclosure is restricted by statue. This type of information should be submitted 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*.

Submitting CBI. Do not submit information containing CBI to the EPA through *https://www.regulations.gov/*. 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, note the docket ID, mark the outside of the digital storage media as CBI, and 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 and note the docket ID. 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 Code of Federal Regulations (CFR) part 2.

Our preferred method to receive CBI is for it to be transmitted electronically using email attachments, File Transfer Protocol (FTP), or other online file sharing services (*e.g.*, Dropbox, OneDrive, Google Drive). Electronic submissions must be transmitted directly to the Office of Air Quality Planning and Standards (OAQPS) CBI Office at the email address *oaqpscbi@epa.gov* and, as described above, should include clear CBI markings and note the docket ID. If assistance is needed with submitting large electronic files that exceed the file size limit for email attachments, and if you do not have your own file sharing service, please email *oaqpscbi@epa.gov* to request a file transfer link. If sending CBI information through the postal service, please send it to the following address: U.S. EPA, Attn: OAQPS Document Control

Officer, Mail Drop: C404-02, 109 T.W. Alexander Drive, P.O. Box 12055, Research Triangle Park, North Carolina 27711, Attention Docket ID No. EPA-HQ-OAR-2023-0282. The mailed CBI material should be double wrapped and clearly marked. Any CBI markings should not show through the outer envelope.

Preamble acronyms and abbreviations. Throughout this preamble the use of "we," "us," or "our" 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:

ACC	American Chemistry Council
ACS	American Community Survey
ADAF	age-dependent adjustment factor
AEGL	acute exposure guideline levels
AERMOD	American Meteorological Society/EPA Regulatory Model dispersion modeling system
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute
APCD	air pollution control device
ASME	American Society of Mechanical Engineers
ATSDR	Agency for Toxic Substances and Disease Registry
1-BP	1-bromopropane
BACT	best available control technology
BTU	British thermal units
CAA	Clean Air Act
CBI	Confidential Business Information
CDX	Central Data Exchange
CEDRI	Compliance and Emissions Data Reporting Interface
CFR	Code of Federal Regulations
CMAS	Chemical Manufacturing Area Sources
CMPU	chemical manufacturing process unit
CO	carbon monoxide
CO_2	carbon dioxide
DNA	deoxyribonucleic acid
EAV	equivalent annualized value
ECHO	Enforcement and Compliance History Online
ECO	extended cookout
EFR	external floating roof
EIA	Economic Impact Analysis
EJ	environmental justice
EMACT	Ethylene Production MACT
EPA	Environmental Protection Agency
ERPG	emergency response planning guidelines
ERT	Electronic Reporting Tool
EtO	ethylene oxide
FID	flame ionization detector

FTIR	Fourier transform infrared spectrometry
GACT	generally available control technologies
HAP	hazardous air pollutant(s)
HCl	hydrochloric acid
HEM	Human Exposure Model
HF	hydrofluoric acid
HON	Hazardous Organic NESHAP
HQ	hazard quotient
HRVOC	highly reactive volatile organic compound
ICR	information collection request
IFR	internal floating roof
IRIS	Integrated Risk Information System
ISA	Integrated Science Assessment
km	kilometer
kPa	kilopascals
LAER	lowest achievable emission rate
lb/hr	pounds per hour
LDAR	leak detection and repair
LEAN	Louisiana Environmental Action Network
LEL	lower explosive limit
MACT	maximum achievable control technology
MIR	maximum individual lifetime [cancer] risk
MON	Miscellaneous Organic Chemical Manufacturing NESHAP
MTVP	maximum true vapor pressure
NAAQS	National Ambient Air Quality Standard
NAICS	North American Industry Classification System
NEI	National Emissions Inventory
NESHAP	national emission standards for hazardous air pollutants
NHVcz	net heating value in the combustion zone gas
NHVdil	net heating value dilution parameter
NHVvg	net heating value in the vent gas
NO_x	nitrogen oxides
NRDC	Natural Resources Defense Council
NSPS	new source performance standards
NTTAA	National Technology Transfer and Advancement Act
OAQPS	Office of Air Quality Planning and Standards
OAR	Office of Air and Radiation
OLD	Organic Liquids Distribution
OMB	Office of Management and Budget
P&R I	Group I Polymers and Resins NESHAP
PDF	portable document format
PEPO	polyether polyol
PMPU	polyether polyol manufacturing process unit
POM	polycyclic organic matter
ppmv	parts per million by volume
ppmw	parts per million by weight
PRA	Paperwork Reduction Act
psia	pounds per square inch absolute
psig	pounds per square inch gauge
PRD	pressure relief devices
PV	present value
RACT	reasonably available control technology

RDL	representative detection limit
REL	Reference Exposure Level
RFA	Regulatory Flexibility Act
RfC	reference concentration
RTR	Risk and Technology Review
SAB	Science Advisory Board
SCAQMD	South Coast Air Quality Management District
scmm	standard cubic meters per minute
scf	standard cubic foot
SOCMI	Synthetic Organic Chemical Manufacturing Industry
SO2	sulfur dioxide
SSM	startup, shutdown, and malfunction
TCEQ	Texas Commission on Environmental Quality
THF	tetrahydrofuran
TOC	total organic compound
TOSHI	target organ-specific hazard index
tpy	tons per year
TRE	total resource effectiveness
TRIM	Total Risk Integrated Methodology
UF	uncertainty factor
UMRA	Unfunded Mandates Reform Act
URE	unit risk estimate
U.S.	United States
U.S.C.	United States Code
USGS	U.S. Geological Survey
VCS	voluntary consensus standards
VOC	volatile organic compound(s)
$\mu g/m^3$	micrograms per cubic meter

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H. Executive Order 13211: Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use
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J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations and Executive Order 14096: Revitalizing Our Nation's Commitment to Environmental Justice for All

I. General Information

A. Does this action apply to me?

This action applies to the PEPO Production source category (and whose facilities, sources, and processes we often refer to as "PEPO" for purposes of the NESHAP). The PEPO NESHAP is codified at 40 CFR part 63, subpart PPP. The North American Industry Classification System (NAICS) code for PEPO facilities is 325199, although this is not intended to be exhaustive but rather to provide a guide for readers regarding the entities that this proposed action is likely to affect. The proposed standards, once promulgated, will be directly applicable to the affected sources. Federal, State, local, and Tribal government entities would not be affected by this proposed action. As defined in the *Initial List of Categories of Sources Under Section 112(c)(1) of the Clean Air Act Amendments of 1990* (see 57 FR 31576, July 16, 1992)

and *Documentation for Developing the Initial Source Category List, Final Report* (see EPA-450/3-91-030, July 1992), the PEPO Production source category is any facility which "manufactures these polymers by starting with cyclic ethers (*e.g.*, oxides, epoxides) and initiating polymerization by adding ethylene oxide, butylene oxide, propylene oxide or other chemicals which would result in the potential emission of HAPs. The reaction is base-catalyzed, with potassium hydroxide being the most commonly used catalyst. The physical properties of the polyols are influenced primarily by the functionality of the initiator molecules and by the type and quantity of alkylene oxide and hydroxyl groups present in the polyol." In the development of NESHAP for this source category, the EPA considered emission sources associated with equipment leaks (including leaks from heat exchange systems), process vents, storage vessels, and wastewater collection and treatment systems.

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 action is available on the internet. In accordance with 5 U.S.C. 553(b)(4), a brief summary of this rulemaking may be found at *https://www.regulations.gov*, Docket ID No. EPA-HQ-OAR-2023-0282. 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/polyether-polyols-production-national-emission-standards-hazardous*. 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.

A memorandum showing the edits that would be necessary to incorporate the changes to the PEPO NESHAP (40 CFR part 63, subpart PPP) proposed in this action is available in the docket (Docket ID No. EPA-HQ-OAR-2023-0282). Following signature by the EPA Administrator, the EPA also will post a copy of this document to *https://www.epa.gov/stationary-sources-air-pollution/polyether-polyols-production-national-emission-standards-hazardous*.

II. Background

A. What is the statutory authority for this action?

1. NESHAP

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 of the CAA establishes a two-stage regulatory process to develop standards for emissions of HAP from stationary sources. Generally, the first stage involves establishing technology-based standards and the second stage involves evaluating those standards that are based on maximum achievable control technology (MACT) to determine whether additional standards are needed to address any remaining risk associated with HAP emissions. This second stage is commonly referred to as the "residual risk review." In addition to the residual risk review, the CAA also requires the EPA to review standards set under CAA section 112 every 8 years and revise the standards as necessary taking into account any "developments in practices, processes, or control technologies." This review is commonly referred to as the "technology review." When the two reviews are combined into a single rulemaking, it is commonly referred to as the "risk and technology review." The discussion that follows identifies the most relevant statutory sections and briefly explains the contours of the methodology used to implement these statutory requirements. A more comprehensive discussion appears in the document titled *CAA Section 112 Risk and Technology Reviews: Statutory Authority and Methodology*, in the docket for this rulemaking.

In the first stage of the CAA section 112 standard setting process, the EPA promulgates technology-based standards under CAA section 112(d) for categories of sources listed under section 112(c) and identified as emitting one or more of the HAP listed in CAA section 112(b). Sources of HAP emissions are either major sources or area sources, and CAA section 112 establishes different requirements for major source standards and area source standards. "Major sources" are those that emit or have the potential to emit 10 tpy or more of a single HAP or 25 tpy or more of any combination of HAP. All other sources are "area sources." For major sources, CAA section 112(d)(2) provides that the technology-based NESHAP must reflect the maximum

degree of emission reductions of HAP achievable (after considering cost, energy requirements, and non-air quality health and environmental impacts). These standards are commonly referred to as MACT standards. CAA section 112(d)(3) also establishes a minimum control level for MACT standards, known as the MACT "floor," that the EPA must establish without consideration of costs. Under CAA section 112(d)(2), the EPA must also consider control options that are more stringent than the floor, taking into consideration costs, non-air quality health and environmental impacts, and energy requirements. Standards more stringent than the floor are commonly referred to as "beyond-the-floor" or "BTF" standards. In certain instances, as provided in CAA section 112(h), the EPA may set work practice standards in lieu of numerical emission standards. For area sources, CAA section 112(d)(5) gives the EPA discretion to set standards based on generally available control technologies or management practices (GACT standards) in lieu of MACT standards.

The second stage in standard-setting focuses on identifying and addressing any remaining (*i.e.*, "residual") risk pursuant to CAA section 112(f). For source categories subject to MACT standards, section 112(f)(2) of the CAA requires the EPA to determine whether promulgation of additional standards is needed to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect. Section 112(d)(5) of the CAA provides that this residual risk review is not required for categories of area sources subject to GACT standards. Section 112(f)(2)(B) of the CAA further expressly preserves the EPA's use of the two-step approach for developing standards to address any residual risk and the Agency's interpretation of "ample margin of safety" developed in the *National Emissions Standards for Hazardous Air Pollutants: Benzene Emissions from Maleic Anhydride Plants, Ethylbenzene/Styrene Plants, Benzene Storage Vessels, Benzene Equipment Leaks, and Coke By-Product Recovery Plants* (Benzene NESHAP) (54 FR 38044, September 14, 1989). The EPA notified Congress in the Residual Risk Report that the Agency intended to use the Benzene NESHAP approach in making CAA section 112(f) residual risk determinations (EPA-453/R-99-001, p. ES-11). The EPA

subsequently adopted this approach in its residual risk determinations and the United States Court of Appeals for the District of Columbia Circuit affirmed that CAA section 112(f)(2) incorporates the approach established in the Benzene NESHAP. *See Natural Resources Defense Council (NRDC) v. EPA*, 529 F.3d 1077, 1083 (D.C. Cir. 2008).

The approach incorporated into the CAA and used by the EPA to evaluate residual risk and to develop standards under CAA section 112(f)(2) is a two-step approach. In the first step, the EPA determines whether risks are acceptable. This determination "considers all health information, including risk estimation uncertainty, and includes a presumptive limit on maximum individual lifetime [cancer] risk (MIR)[1] of approximately 1 in 10 thousand." (54 FR 38045). If risks are unacceptable, the EPA must determine the emissions standards necessary to reduce risk to an acceptable level without considering costs. In the second step of the approach, the EPA considers whether the emissions standards provide an ample margin of safety to protect public health "in consideration of all health information, including the number of persons at risk levels higher than approximately 1 in 1 million, as well as other relevant factors, including costs and economic impacts, technological feasibility, and other factors relevant to each particular decision." *Id*. The EPA must promulgate emission standards necessary to provide an ample margin of safety to protect public health or determine that the standards being reviewed provide an ample margin of safety without any revisions. After conducting the ample margin of safety analysis, we consider whether a more stringent standard is necessary to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect.

CAA section 112(d)(6) separately requires the EPA to review standards promulgated under CAA section 112 and revise them "as necessary (taking into account developments in practices, processes, and control technologies)" no less often than every 8 years. In conducting this review, which we call the "technology review," the EPA is not required to recalculate the

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

MACT floors that were established during earlier rulemakings. *NRDC v. EPA*, 529 F.3d at 1084 (D.C. Cir. 2008); *Association of Battery Recyclers, Inc. v. EPA*, 716 F.3d 667 (D.C. Cir. 2013). The EPA may consider cost in deciding whether to revise the standards pursuant to CAA section 112(d)(6). The EPA is required to address regulatory gaps, such as missing MACT 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).

The EPA conducted a residual risk and technology review (RTR) for the PEPO NESHAP in 2014, concluding that there was no need to revise the PEPO NESHAP under the provisions of either CAA sections 112(f) or (d)(6). However, the EPA did address emissions during periods of startup, shutdown, and malfunction (SSM), including from pressure relief devices (PRDs) in organic HAP service that release to the atmosphere, and also required electronic reporting of performance test results (see 79 FR 17340, March 27, 2014). As part of the 2014 residual risk review, the EPA conducted a risk assessment, and based on the results of the risk assessment, determined that the then current level of control called for by the existing MACT standards both reduced HAP emissions to levels that presented an acceptable level of risk and provided an ample margin of safety to protect public health.

This action constitutes another CAA section 112(d)(6) technology review for the PEPO NESHAP. This action also constitutes an updated CAA section 112(f) risk review based on new information for the PEPO NESHAP. As noted above, CAA section 112(f)(2)(A) requires the EPA to promulgate standards that "provide an ample margin of safety to protect public health" and prevent "an adverse environmental effect." While CAA section 112(f) does not require the EPA to periodically revisit a residual risk review, neither does it preclude the EPA from exercising its inherent authority to revisit a previous regulatory decision where new scientific, technical, or other relevant information indicates such action is warranted. Moreover, the Act does include a gap-filling provision that reinforces the authority for the EPA to do so. CAA section 301(a)(1) provides authority to the Administrator "to prescribe such regulations as are

necessary to carry out his functions" under the CAA. Such authority extends to the EPA's discretion to revisit its section 112(f) residual risk review where the Agency deems warranted. *See NRDC v. EPA*, 22 F.3d 1125, 1148 (D.C. Cir. 1994) ("[Section 301] is sufficiently broad to allow the promulgation of rules that are necessary and reasonable to effect the purposes of the Act."). We note that although there is no statutory CAA obligation under CAA section 112(f) for the EPA to conduct a second residual risk review of the PEPO NESHAP, the EPA retains discretion to revisit its residual risk reviews where the Agency deems that it is warranted. *See, e.g.*, *Fed. Commc'ns Comm'n v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009); *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 42 (1983); *Ethylene Oxide Emissions Standards for Sterilization Facilities; Final Decision*, 71 FR 17712, 17715 col. 1 (April 7, 2006) (in the 2006 residual risk review of the EtO emissions standards for sterilization facilities, the EPA asserted its "authority to revisit (and revise, if necessary) any rulemaking if there is sufficient evidence that changes within the affected industry or significant improvements to science suggests the public is exposed to significant increases in risk as compared to the risk assessment prepared for the rulemaking (*e.g.*, CAA section 301)."). Here, the specific changes to health information related to a certain pollutant emitted by the PEPO Production source category led us to determine that it is appropriate, in this case, to conduct this second residual risk review under CAA section 112(f). In particular, the EPA is concerned about the cancer risks posed from the PEPO Production source category based on the EPA's 2016 updated Integrated Risk Information System (IRIS) inhalation unit risk estimate (URE) for EtO, which shows EtO to be significantly more toxic than previously known.[2] The EPA's 2014 RTR could not have had the benefit of this updated URE at the time it was conducted, but if it had the RTR would have

[2] U.S. EPA. *Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide (CASRN 75-21-8) In Support of Summary Information on the Integrated Risk Information System (IRIS)*. December 2016. EPA/635/R-16/350Fa. Available at: *https://cfpub.epa.gov/ncea/iris/iris_documents/documents/toxreviews/1025tr.pdf*. See also, 87 FR 77985 (Dec. 21, 2022), *Reconsideration of the 2020 National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing Residual Risk and Technology Review*, Final action; reconsideration of the final rule.

necessarily resulted in different conclusions about risk acceptability and the PEPO NESHAP's provision of an ample margin of safety to protect public health. To ensure our standards provide an ample margin of safety to protect public health following the new IRIS inhalation URE for EtO, we are exercising our discretion and conducting a risk assessment in this action for PEPO Production sources. In sum, even though we do not have a mandatory duty to conduct repeated residual risk reviews under CAA sections 112(f)(2) and 301(a)(1), we have the authority to revisit any rulemaking if there is sufficient evidence of changes within the affected industry or significant new scientific information suggesting the public is exposed to higher risks than previously understood. Our conducting a discretionary second residual risk review for the PEPO Production source category to account for the new IRIS inhalation URE for EtO is consistent with recent similar actions regarding other source categories. See 89 FR 24090, April 5, 2024, and 89 FR 42932, May 16, 2024.

2. Petition for Reconsideration

In addition to the proposed action under sections 112 and 301 of the CAA described above, this action includes proposed amendments to the PEPO NESHAP based on the EPA's reconsideration of certain aspects of the NESHAP that were raised in an administrative petition submitted pursuant to section 307(d)(7)(B) of the CAA. In May 2014, the EPA received one petition for reconsideration of the PEPO NESHAP (40 CFR part 63, subpart PPP), Pesticide Active Ingredient Production NESHAP (40 CFR part 63, subpart MMM), and Group IV Polymers and Resins NESHAP (40 CFR part 63, subpart JJJ) pursuant to CAA section 307(d)(7)(B) from the Louisiana Environmental Action Network, Ohio Valley Environmental Coalition, and Sierra Club. A copy of the petition and subsequent EPA correspondence granting reconsideration is provided in the docket for this rulemaking (see Docket No. EPA-HQ-OAR-2023-0282).

For the PEPO NESHAP, the petitioners requested that the EPA: (1) remove the affirmative defense provisions from the rules in light of the court opinion in *Natural Resources*

Defence Council v. EPA (D.C. Cir. April 18, 2014); (2) provide adequate opportunity to comment on the requirements associated with emissions from PRDs (including associated compliance dates, the EPA's decision to not specifically require electronic indicators and alarms to monitor PRD releases to the atmosphere, and the standard's applicability to PRDs in organic HAP service versus PRDs in total HAP service); (3) redo the risk assessment using updated emission factors; (4) set additional monitoring requirements for flares to reduce flaring emissions; (5) set fenceline monitoring requirements; (6) reconsider its decision not to set standards that account for developments in leak detection and repair (LDAR); and (7) use existing regulatory authority to strengthen chemical facility safety and prevent accidents in accordance with the U.S. Chemical Safety and Hazard Investigation Board and Executive Order 13650. On August 26, 2014, the EPA sent a letter to the petitioners informing them that the EPA was granting their request for reconsideration at least on issues (1) and (2) above. A copy of the August 26, 2014, letter is provided in the docket for this rulemaking (see Docket No. EPA-HQ-OAR-2023-0282). In the letter, the EPA also indicated that it would be initiating a notice and comment rulemaking on the issues for which we granted reconsideration; therefore, one purpose of this action is to formally respond to the issues raised in the petition with respect to the PEPO NESHAP.[3]

In a separate rulemaking (see 89 FR 52425, June 24, 2024), the EPA is addressing issue (1), the affirmative defense against civil penalties for violations occurring during malfunctions. That separate rulemaking removes affirmative defense provisions from both NSPS and NESHAP rules, including the PEPO NESHAP. Therefore, this proposed action does not address removal of the affirmative defense provisions.

[3] Although the issues identified in this paragraph (in addition to one other issue related to alternative compliance demonstration methods for periods of startup and shutdown) were also raised for 40 CFR part 63, subparts JJJ and MMM; this action does not respond to the reconsideration of these NESHAP, as the EPA is not reviewing these subparts in this action.

This action presents the EPA's proposed revisions to the PEPO NESHAP based on the EPA's reconsideration of issue (2) in the petition (see section IV.E.1 of this preamble for details about these proposed amendments). Coincidentally, we also believe this action addresses issues (3), (4), (5), and (6) in our normal course of review of the PEPO NESHAP in accordance with sections 112 and 301 of the CAA. See sections IV.A and IV.B of this preamble for our proposed decisions relvant to issue (3), section IV.D.1 of this preamble for our proposed decisions relevant to issue (4), section IV.C.6 of this preamble for our proposed decisions relevant to issue (5), and sections IV.B.2.b and IV.C.5 of this preamble for our proposed decisions relevant to issue (6). With regard to issue (7), the EPA's authority to address catastrophic releases under the NESHAP program was viewed as limited under the pre-1990 CAA. Congress added CAA section 112(r) to address this gap. In light of the extensive history and efforts of the agency on inherently safer technology specifically and catastrophic accidents generally under the section 112(r) program, and in light of the statutory structure of section 112, we view the request to enact such provisions in this rulemaking to be outside the scope of section 112(f)(2) and section 112(d)(6). We note that the EPA's regulations on catastrophic releases appear in 40 CFR part 68. Prompted by Executive Order 13650, "Improving Chemical Facility Safety and Security," the Risk Management Program regulations were amended on January 13, 2017, to include new provisions on safer technology and alternatives analysis and other prevention program elements; most recently, the regulations were amended on March 11, 2024, to further enhance the accident prevention and emergency preparedness requirements (89 FR 17622).

B. What is the source category and how do the current standards regulate its HAP emissions?

The source category that is the subject of this proposal is the PEPO Production source category subject to the PEPO NESHAP. The EPA promulgated the PEPO NESHAP on June 1, 1999 (64 FR 29420), and codified the NESHAP at 40 CFR part 63, subpart PPP. As promulgated in 1999, and further amended on July 1, 2004 (69 FR 39862) and March 27, 2014 (59 FR 17340), the PEPO NESHAP regulates HAP emissions from polyether polyol manufacturing

process units (PMPUs) that produce PEPO as its primary product.[4] [5] A PMPU consists of purification systems, reactors and their associated product separators and recovery devices, distillation units and their associated distillate receivers and recovery devices, other associated unit operations, storage vessels, surge control vessels, bottoms receivers, product transfer racks, connected ducts and piping, combustion, recovery, or recapture devices or systems. A PMPU also includes pumps, compressors, agitators, PRDs, sampling connection systems, open-ended valves or lines, valves, connectors, and instrumentation systems.

PEPO are used to make a variety of other products including lubricants, adhesives, sealants, cosmetics, pharmaceuticals, soaps, and a feedstock for polyurethanes production. Urethane grade PEPO (*i.e.*, those that are free of water) are used as raw material in the production of polyurethanes, including slabstock and molded flexible foams, rigid foams and other polyurethanes, including microcellular products, surface coatings, elastomers, fibers, adhesives, and sealants.

PEPO can be produced by either polymerization of epoxides (*i.e.*, a three-membered cyclic ether, such as EtO or propylene oxide) or tetrahydrofuran (THF). The former process is usually conducted as a batch process, while production of polyols using THF is generally a continuous process. EtO and propylene oxide are both HAP, but THF is not. For the MACT regulation, the EPA created two subcategories of PEPO based on the use of either epoxides or THF in polymerization.

The HAP emission sources at PEPO facilities include process vents, storage vessels, equipment leaks, and wastewater. Additionally, some facilities have cooling towers or other heat exchangers which could become HAP emission sources if process fluids leak into the heat

[4] PEPO are compounds formed through the polymerization of EtO or propylene oxide or other cyclic ethers with compounds having one or more reactive hydrogens (*i.e.*, a hydrogen atom bonded to nitrogen, oxygen, phosphorus, sulfur, *etc.*) to form polyethers (*i.e.*, compounds with two or more ether bonds). This definition of PEPO excludes cellulose ethers (such as methyl cellulose, carboxymethyl cellulose, hydroxyethyl cellulose, hydroxy ethyl cellulose, and hydroxypropyl methyl cellulose) and materials regulated under the HON, such as glycols and glycol ethers.

[5] A PMPU also includes flexible operation process units when an owner or operator cannot determine that a PEPO is not the primary product, and a PEPO is produced or anticipated to be produced during time spans described in 40 CFR 63.1420(e)(2).

exchange water. In the production of PEPO, HAP are used primarily as reactants or extraction solvents. HAP emitted from PEPO facilities include EtO, propylene oxide, toluene, methanol, and glycol ethers. The MACT standards for PEPO production include emission limits for process vents; a combination of equipment standards and work practices for storage vessels, wastewater, and equipment leaks; and work practice standards for cooling towers.

As of March 1, 2024, the EPA identified 25 PEPO facilities in operation that are subject to the PEPO NESHAP. The list of facilities located in the United States that are part of the PEPO Production source category with processes subject to the PEPO NESHAP is presented in the document titled *List of Facilities Subject to the PEPO NESHAP*, which is available in the docket for this action (Docket ID No. EPA-HQ-OAR-2023-0282).

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

The EPA used several data sources to determine the facilities that are subject to the PEPO NESHAP discussed in section II.B of this preamble. We identified facilities in the 2017 National Emissions Inventory (NEI) and the Toxics Release Inventory system having a primary facility NAICS code beginning with 325, Chemical Manufacturing. We also used information from the 2014 PEPO NESHAP RTR, other facility lists from the EPA's recent chemical sector rulemakings (*e.g.*, HON), and the Office of Enforcement and Compliance Assurance's Enforcement and Compliance History Online (ECHO) tool (*https://echo.epa.gov*). To inform our reviews of the Agency's emission standards, we reviewed the EPA's Reasonably Available Control Technology (RACT)/Best Available Control Technology (BACT)/Lowest Achievable Emission Rate (LAER) Clearinghouse and regulatory development efforts for similar sources published after the PEPO NESHAP was developed. The EPA also reviewed air emissions permits issued by State regulatory agencies to determine facilities subject to the PEPO NESHAP. Additionally, we met with industry representatives from the American Chemistry Council (ACC) to collect data and discuss industry practices.

In January 2022, the EPA issued requests, pursuant to CAA section 114, to collect information from synthetic organic chemical manufacturing industry (SOCMI) facilities subject to the hazardous organic NESHAP (HON) at 40 CFR part 63, subparts F, G, and H (nine facilities being also subject to the PEPO NESHAP) owned and operated by eight entities (*i.e.*, corporations). Many of the entities chosen for the CAA section 114 request own or operate facilities that produce, use, and emit EtO, which is a pollutant with considerable concern for cancer risk for the PEPO Production source category. This CAA section 114 request focused on gathering comprehensive information about process equipment, control technologies, point and fugitive emissions, and other aspects of facility operations. Additionally, the EPA requested stack testing for certain emission sources (*e.g.*, pollutants for vent streams associated with each EtO production line). Also, the EPA required, as part of the January 2022 CAA section 114 request, that facilities conduct fugitive emission testing (*i.e.*, fenceline monitoring) for any of six specific HAP they emit: benzene; 1,3-butadiene; chloroprene; EtO; ethylene dichloride; and vinyl chloride. Companies submitted responses (and follow-up responses) and testing results to the EPA during the summer and fall of 2022. The EPA used the collected information to fill data gaps, establish the baseline emissions and control levels for purposes of the regulatory reviews, identify the most effective control measures, and estimate the public health and environmental and cost impacts associated with the regulatory options considered and reflected in this proposed action. The information not claimed as CBI by respondents is available in the document titled *Data Received from Information Collection Request for Chemical Manufacturers*, in the docket for this action, Docket ID No. EPA-HQ-OAR-2023-0282.

D. What other relevant background information and data are available?

As mentioned above, this action includes proposed amendments to the current flare requirements in the PEPO NESHAP. In proposing these amendments, we relied on certain technical reports and memoranda that the EPA developed for flares used as air pollution control devices (APCDs) in the Petroleum Refinery Sector RTR and new source performance standards

(NSPS) rulemaking (80 FR 75178, December 1, 2015). The Petroleum Refinery Sector rulemaking docket is at Docket ID No. EPA-HQ-OAR-2010-0682. For completeness of the rulemaking record for this action and for ease of reference in finding these items in the publicly available Petroleum Refinery Sector rulemaking docket, we are including the most relevant flare-related technical support documents in the docket for this proposed action (Docket ID No. EPA-HQ-OAR-2023-0282) and including a list of all documents used to inform the 2015 flare provisions in the Petroleum Refinery Sector RTR and NSPS rulemaking in the document titled *Control Option Impacts for Flares in the PEPO Production Source Category that Control Emissions from Processes Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking.

We are also relying on data gathered to support the rulemakings for the EMACT standards, HON, and MON, as well as memoranda documenting the technology reviews for those processes. Many of the emission sources for ethylene production facilities, HON facilities, and MON facilities are similar to PEPO facilities, so the EPA analyzed several control options for the PEPO NESHAP that the Agency also analyzed for the rulemakings for the EMACT standards, HON, and MON. The memoranda and background technical information can be found in the Ethylene Production RTR rulemaking docket (Docket ID No. EPA-HQ-OAR-2017-0357), the HON rulemaking docket (Docket ID No. EPA-HQ-OAR-2022-0730), and the MON RTR rulemaking docket (Docket ID No. EPA-HQ-OAR-2018-0746). Additional information related to the promulgation and subsequent amendments of the PEPO NESHAP is available in Docket ID Nos. A-96-38, EPA-HQ-OAR-2004-0467, and EPA-HQ-OAR-2011-0435.

E. What outreach was conducted?

We conducted pre-proposal outreach by sharing an overview of the industry and planned rulemaking to the EPA's national environmental justice (EJ) engagement call on August 20, 2024, and the EPA's monthly call with the National Tribal Air Association on August 31, 2023, and August 29, 2024. We also met with members of the ACC on August 13, 2024. The EPA also

previously engaged in outreach activities with communities we expected to be impacted by chemical plants emitting EtO in 2021.[6]

III. Analytical Procedures and Decision-Making

A. How do we consider risk in our decision-making?

As discussed in section II.A of this preamble and in the Benzene NESHAP, in evaluating and developing standards under CAA section 112(f)(2), we apply a two-step approach to determine whether or not risks are acceptable and to determine if the standards provide an ample margin of safety to protect public health. As explained in the Benzene NESHAP, "the first step judgment on acceptability cannot be reduced to any single factor" and, thus, "[t]he Administrator believes that the acceptability of risk under section 112 is best judged on the basis of a broad set of health risk measures and information." (54 FR 38046). Similarly, with regard to the ample margin of safety determination, "the Agency again considers all of the health risk and other health information considered in the first step. Beyond that information, additional factors relating to the appropriate level of control will also be considered, including cost and economic impacts of controls, technological feasibility, uncertainties, and any other relevant factors." *Id*.

The Benzene NESHAP approach provides flexibility regarding factors the EPA may consider in making determinations and how the EPA may weigh those factors for each source category. The EPA conducts a risk assessment that provides estimates of the MIR posed by emissions of HAP that are carcinogens from each source in the source category, the hazard index (HI) for chronic exposures to HAP with the potential to cause noncancer health effects, and the hazard quotient (HQ) for acute exposures to HAP with the potential to cause noncancer health effects.[7] The assessment also provides estimates of the distribution of cancer risk within the exposed populations, cancer incidence, and an evaluation of the potential for an adverse

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[6] *https://www.epa.gov/hazardous-air-pollutants-ethylene-oxide/inspector-general-follow-ethylene-oxide-0*.

[7] The MIR is defined as the cancer risk associated with a lifetime of exposure at the highest concentration of HAP where people are likely to live. The HQ is the ratio of the potential HAP exposure concentration to the noncancer dose-response value; the HI is the sum of HQs for HAP that affect the same target organ or organ system.

environmental effect. The scope of the EPA's risk analysis is consistent with the explanation in the EPA's response to comments on our policy under the 1989 Benzene NESHAP:

> The policy chosen by the Administrator permits consideration of multiple measures of health risk. Not only can the MIR figure be considered, but also incidence, the presence of non-cancer health effects, and the uncertainties of the risk estimates. In this way, the effect on the most exposed individuals can be reviewed as well as the impact on the general public. These factors can then be weighed in each individual case. This approach complies with the *Vinyl Chloride* mandate that the Administrator ascertain an acceptable level of risk to the public by employing his expertise to assess available data. It also complies with the Congressional intent behind the CAA, which did not exclude the use of any particular measure of public health risk from the EPA's consideration with respect to CAA section 112 regulations, and thereby implicitly permits consideration of any and all measures of health risk which the Administrator, in his judgment, believes are appropriate to determining what will "protect the public health".

(54 FR 38057). Thus, the level of the MIR is only one factor to be weighed in determining acceptability of risk. The Benzene NESHAP explained that "an MIR of approximately one in 10 thousand should ordinarily be the upper end of the range of acceptability. As risks increase above this benchmark, they become presumptively less acceptable under CAA section 112, and would be weighed with the other health risk measures and information in making an overall judgment on acceptability. Or, the Agency may find, in a particular case, that a risk that includes an MIR less than the presumptively acceptable level is unacceptable in the light of other health risk factors." *Id*. at 38045. In other words, risks that include an MIR above 100-in-1 million (1-in-10 thousand) may be determined to be acceptable, and risks with an MIR below that level may be determined to be unacceptable, depending on all of the available health information. Similarly, with regard to the ample margin of safety analysis, the EPA stated in the 1989 Benzene NESHAP that: "EPA believes the relative weight of the many factors that can be considered in selecting an ample margin of safety can only be determined for each specific source category. This occurs mainly because technological and economic factors (along with the health-related factors) vary from source category to source category." *Id*. at 38061. We also consider the uncertainties associated with the various risk analyses, as discussed earlier in this preamble, in our determinations of acceptability and ample margin of safety.

The EPA notes that it has not considered certain health information to date in making residual risk determinations. At this time, we do not attempt to quantify the HAP risk that may be associated with emissions from other facilities that do not include the source category under review, mobile source emissions, natural source emissions, persistent environmental pollution, or atmospheric transformation in the vicinity of the sources in the category.

The EPA understands the potential importance of considering an individual's total exposure to HAP in addition to considering exposure to HAP emissions from the source category and facility. We recognize that such consideration may be particularly important when assessing noncancer risk, where pollutant-specific exposure health reference levels (*e.g.*, reference concentrations (RfCs)) are based on the assumption that thresholds exist for adverse health effects. For example, the EPA recognizes that, although exposures attributable to emissions from a source category or facility alone may not indicate the potential for increased risk of adverse noncancer health effects in a population, the exposures resulting from emissions from the facility in combination with emissions from all of the other sources (*e.g.*, other facilities) to which an individual is exposed may be sufficient to result in an increased risk of adverse noncancer health effects. In May 2010, the Science Advisory Board (SAB) advised the EPA "that RTR assessments will be most useful to decision makers and communities if results are presented in the broader context of aggregate and cumulative risks, including background concentrations and contributions from other sources in the area."[8]

In response to the SAB recommendations, the EPA incorporates cumulative risk analyses into its RTR risk assessments. The Agency: (1) conducts facility-wide assessments, which include source category emission points, as well as other emission points within the facilities; (2) combines exposures from multiple sources in the same category that could affect the same individuals; and (3) for some persistent and bioaccumulative pollutants, analyzes the ingestion

[8] Recommendations of the SAB Risk and Technology Review Methods Panel are provided in their report, which is available at: *https://www.epa.gov/sites/default/files/2021-02/documents/epa-sab-10-007-unsigned.pdf*.

route of exposure. In addition, the RTR risk assessments consider aggregate cancer risk from all carcinogens and aggregated noncancer HQs for all noncarcinogens affecting the same target organ or target organ system.

Although we are interested in placing source category and facility-wide HAP risk in the context of total HAP risk from all sources combined in the vicinity of each source, we are concerned about the uncertainties of doing so. Estimates of total HAP risk from emission sources other than those that we have studied in depth during this RTR review would have significantly greater associated uncertainties than the source category or facility-wide estimates. While we evaluated the risk from HAP emitted by all stationary point sources near facilities within this source category in the community-based risk assessment, that assessment is intended to provide additional context to the public and was not used for decision-making in this proposed rule.

B. How do we estimate post-MACT risk posed by the source category?

In this section, we provide a complete description of the types of analyses that we generally perform during the risk assessment process. In some cases, we do not perform a specific analysis because it is not relevant. For example, in the absence of emissions of HAP known to be persistent and bioaccumulative in the environment (PB-HAP), we would not perform a multipathway exposure assessment. Where we do not perform an analysis, we state that we do not and provide the reason. While we present all of our risk assessment methods, we only present risk assessment results for the analyses actually conducted (see section IV.A of this preamble).

The EPA conducts a risk assessment that provides estimates of the MIR for cancer posed by the HAP emissions from each source in the source category, the HI for chronic exposures to HAP with the potential to cause noncancer health effects, and the HQ for acute exposures to HAP with the potential to cause noncancer health effects. The assessment also provides estimates of the distribution of cancer risk within the exposed populations, cancer incidence, and an evaluation of the potential for an adverse environmental effect. The nine sections that follow this

paragraph describe how we estimated emissions and conducted the risk assessment. The docket for this rulemaking contains the following document which provides more information on the risk assessment inputs and models: *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule*. The methods used to assess risk (as described in the nine primary steps below) are consistent with those described by the EPA in the document reviewed by a panel of the EPA's SAB in 2009;[9] and described in the SAB review report issued in 2010. They are also consistent with the key recommendations contained in that report.

1. How did we estimate actual emissions and identify the emissions release characteristics?

As previously discussed, we updated the risk assessment in this action for the PEPO Production source category because the source category has sources that emit EtO. The EPA developed the list of 25 facilities for the PEPO Production source category as described in section II.B of this preamble. We developed the emissions modeling input files using the EPA's 2017 NEI. However, in a few instances where facility-specific data were not available or not reflective of current controls in the 2017 NEI, we obtained data from a more recent dataset (*e.g.*, review of emissions inventory data from our CAA section 114 request, more recent inventories submitted to States, or 2018 NEI). The EPA also used the NEI data to develop the other parameters needed to perform the risk modeling analysis including the emissions release characteristics, such as stack heights, stack diameters, volumetric flow rates, temperatures, and emission release point locations. For further details on the assumptions and methodologies used to estimate actual emissions, see appendix 1 of the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule,* which is available in the docket for this rulemaking.

2. How did we estimate MACT-allowable emissions?

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[9] U.S. EPA. *Risk and Technology Review (RTR) Risk Assessment Methodologies: For Review by the EPA's Science Advisory Board with Case Studies – MACT I Petroleum Refining Sources and Portland Cement Manufacturing*, June 2009. EPA-452/R-09-006. *https://www3.epa.gov/airtoxics/rrisk/rtrpg.html*.

The available emissions data in the RTR emissions dataset include estimates of the mass of HAP emitted during a specified annual time period. These "actual" emission levels are often lower than the emission levels allowed under the requirements of the current MACT standards. The emissions allowed under the MACT standards are referred to as the "MACT-allowable" emissions. We discussed the consideration of both MACT-allowable and actual emissions in the 2005 final RTR for Coke Oven Batteries (70 FR 19992, 19998–99, April 15, 2005) and in the 2006 proposed and final RTR for the HON (71 FR 34421, 34428, June 14, 2006, and 71 FR 76603, 76609, December 21, 2006, respectively). In those actions, we noted that assessing the risk at the MACT-allowable level is inherently reasonable since that risk reflects the maximum level facilities could emit and still comply with national emission standards. We also explained that it is reasonable to consider actual emissions, where such data are available, in both steps of the risk analysis, in accordance with the Benzene NESHAP approach. (54 FR 38044.)

For this analysis, we have determined that the actual emissions data are reasonable estimates of the MACT-allowable emissions levels for the PEPO Production source category, as we are not generally aware of any situations in which a facility is conducting additional work practices or operating a control device such that it achieves a far greater emission reduction than required by the NESHAP. However, in cases where we encountered a permit emissions limit that appeared to be higher than the reported emissions, we recorded that in the allowable emissions column of the modeling file to assess the risk of allowable emissions. For further details on the assumptions and methodologies used to estimate MACT-allowable emissions, see appendix 1 of the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule,* which is available in the docket for this rulemaking.

3. How do we conduct dispersion modeling, determine inhalation exposures, and estimate individual and population inhalation risk?

Both long-term and short-term inhalation exposure concentrations and health risk from the source category addressed in this proposal were estimated using the Human Exposure Model (HEM-4).[10] The HEM-4 performs three primary risk assessment activities: (1) conducting dispersion modeling to estimate the concentrations of HAP in ambient air, (2) estimating long-term and short-term inhalation exposures to individuals residing within 50 kilometers (km) of the modeled sources, and (3) estimating individual and population-level inhalation risk using the exposure estimates and quantitative dose-response information.

a. Dispersion Modeling

The air dispersion model AERMOD (American Meteorological Society/EPA Regulatory Model dispersion modeling system), used by the HEM-4, is one of the EPA's preferred models for assessing air pollutant concentrations from industrial facilities.[11] To perform the dispersion modeling and to develop the preliminary risk estimates, HEM-4 draws on three data libraries. The first is a library of meteorological data, which is used for dispersion calculations. This library includes 1 year (2019) of hourly surface and upper air observations from over 800 meteorological stations, selected to provide coverage of the United States and Puerto Rico. A second library of United States Census Bureau census block[12] internal point locations and populations provides the basis of human exposure calculations (U.S. Census, 2020). In addition, for each census block, the census library includes the elevation and controlling hill height, which are also used in dispersion calculations. A third library of pollutant-specific dose-response values is used to estimate health risk. These are discussed below.

b. Risk from Chronic Exposure to HAP

In developing the risk assessment for chronic exposures, we use the estimated annual average ambient air concentrations of each HAP emitted by each source in the source category.

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[10] For more information about HEM-4, go to *https://www.epa.gov/fera/risk-assessment-and-modeling-human-exposure-model-hem.*

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

[12] A census block is the smallest geographic area for which census statistics are tabulated.

The HAP air concentrations at each nearby census block centroid located within 50 km of the facility are a surrogate for the chronic inhalation exposure concentration for all the people who reside in that census block. A distance of 50 km is consistent with both the analysis supporting the 1989 Benzene NESHAP (54 FR 38044) and the limitations of Gaussian dispersion models, including AERMOD.

For each facility, we calculate the MIR as the cancer risk associated with a continuous lifetime (24 hours per day, 7 days per week, 52 weeks per year, 70 years) exposure to the maximum annual average concentration at the centroid of each inhabited census block. We calculate individual cancer risk by multiplying the estimated lifetime exposure to the ambient concentration of each HAP (in micrograms per cubic meter ($\mu g/m^3$)) by its URE. The URE is an upper-bound estimate of an individual's incremental risk of contracting cancer over a lifetime of exposure to a concentration of 1 $\mu g/m^3$ of air. For residual risk assessments, we generally use UREs from the EPA's IRIS. For carcinogenic pollutants without IRIS values, we look to other reputable sources of cancer dose-response values, often using California EPA (CalEPA) UREs, where available. In cases where new, scientifically credible dose-response values have been developed in a manner consistent with EPA guidelines and have undergone a peer review process similar to that used by the EPA, we may use such dose-response values in place of, or in addition to, other values, if appropriate. The pollutant-specific dose-response values used to estimate health risk are available at *https://www.epa.gov/fera/dose-response-assessment-assessing-health-risks-associated-exposure-hazardous-air-pollutants*.

To estimate individual lifetime cancer risks associated with exposure to HAP emissions from each facility in the source category, we sum the risks for each of the carcinogenic HAP[13] emitted by the modeled facility. We estimate cancer risk at every census block within 50 km of every facility in the source category. The MIR is the highest individual lifetime cancer risk estimated for any of those census blocks. In addition to calculating the MIR, we estimate the distribution of individual cancer risks for the source category by summing the number of individuals within 50 km of the sources whose estimated risk falls within a specified risk range. We also estimate annual cancer incidence by multiplying the estimated lifetime cancer risk at each census block by the number of people residing in that block, summing results for all of the census blocks, and then dividing this result by a 70-year lifetime.

To assess the risk of noncancer health effects from chronic exposure to HAP, we calculate either an HQ or a target organ-specific hazard index (TOSHI). We calculate an HQ when a single noncancer HAP is emitted. Where more than one noncancer HAP is emitted, we sum the HQ for each of the HAP that affects a common target organ or target organ system to obtain a TOSHI. The HQ is the estimated exposure divided by the chronic noncancer dose-response value, which is a value selected from one of several sources. The preferred chronic noncancer dose-response value is the EPA RfC, defined as "an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime"

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[13] The EPA's 2005 *Guidelines for Carcinogen Risk Assessment* classifies carcinogens as: "carcinogenic to humans," "likely to be carcinogenic to humans," and "suggestive evidence of carcinogenic potential." These classifications also coincide with the terms "known carcinogen," "probable carcinogen," and "possible carcinogen," respectively, which are the terms advocated in the EPA's *Guidelines for Carcinogen Risk Assessment*, published in 1986 (51 FR 33992, September 24, 1986). In August 2000, the document, *Supplemental Guidance for Conducting Health Risk Assessment of Chemical Mixtures* (EPA/630/R-00/002), was published as a supplement to the 1986 document. Copies of both documents can be obtained from *https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=20533&CFID=70315376&CFTOKEN=71597944*. Summing the risk of these individual compounds to obtain the cumulative cancer risk is an approach that was recommended by the EPA's SAB in their 2002 peer review of the EPA's National Air Toxics Assessment (NATA) titled *NATA - Evaluating the National-scale Air Toxics Assessment 1996 Data -- an SAB Advisory*, available at *https://yosemite.epa.gov/sab/sabproduct.nsf/214C6E915BB04E14852570CA007A682C/$File/ecadv02001.pdf*.

(*https://iaspub.epa.gov/sor_internet/registry/termreg/searchandretrieve/glossariesandkeywordlists/search.do?details=&vocabName=IRIS%20Glossary*). In cases where an RfC from the EPA's IRIS is not available or where the EPA determines that using a value other than the RfC is appropriate, the chronic noncancer dose-response value can be a value from the following prioritized sources, which define their dose-response values similarly to the EPA: (1) the Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Level (*https://www.atsdr.cdc.gov/mrls/index.asp*); (2) the CalEPA Chronic Reference Exposure Level (REL) (*https://oehha.ca.gov/air/crnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0*); or (3) as noted above, a scientifically credible dose-response value that has been developed in a manner consistent with the EPA guidelines and has undergone a peer review process similar to that used by the EPA. The pollutant-specific dose-response values used to estimate health risks are available at *https://www.epa.gov/fera/dose-response-assessment-assessing-health-risks-associated-exposure-hazardous-air-pollutants*.

c. Risk from Acute Exposure to HAP That May Cause Health Effects Other Than Cancer

For each HAP for which appropriate acute inhalation dose-response values are available, the EPA also assesses the potential health risks due to acute exposure. For these assessments, the EPA makes health protective assumptions about emission rates, meteorology, and exposure location. As part of our efforts to continually improve our methodologies to evaluate the risks that HAP emitted from categories of industrial sources pose to human health and the environment,[14] we revised our treatment of meteorological data to use reasonable worst-case air dispersion conditions in our acute risk screening assessments instead of worst-case air dispersion conditions. This revised treatment of meteorological data and the supporting rationale are described in more detail in the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology*

[14] See, *e.g.*, U.S. EPA. *Screening Methodologies to Support Risk and Technology Reviews (RTR): A Case Study Analysis* (Draft Report, May 2017. (*https://www3.epa.gov/ttn/atw/rrisk/rtrpg.html*).

Review Proposed Rule and in appendix 5 of the report *Technical Support Document for Acute Risk Screening Assessment*, which are available in the docket for this rulemaking. This revised approach has been used in this proposed rule and in all other RTR rulemakings proposed on or after June 3, 2019.

To assess the potential acute risk to the maximally exposed individual, we use the peak hourly emission rate for each emission point,[15] reasonable worst-case air dispersion conditions *(i.e.*, 99th percentile), and the point of highest off-site exposure. Specifically, we assume that peak emissions from the source category and reasonable worst-case air dispersion conditions co-occur and that a person is present at the point of maximum exposure.

To characterize the potential health risks associated with estimated acute inhalation exposures to a HAP, we generally use multiple acute dose-response values, including acute RELs, acute exposure guideline levels (AEGLs), and emergency response planning guidelines (ERPG) for 1-hour exposure durations, if available, to calculate acute HQs. The acute HQ is calculated by dividing the estimated acute exposure concentration by the acute dose-response value. For each HAP for which acute dose-response values are available, the EPA calculates acute HQs.

An acute REL is defined as "the concentration level at or below which no adverse health effects are anticipated for a specified exposure duration."[16] Acute RELs are based on the most sensitive, relevant, adverse health effect reported in the peer-reviewed medical and toxicological literature. They are designed to protect the most sensitive individuals in the population through the inclusion of margins of safety. Because margins of safety are incorporated to address data gaps and uncertainties, exceeding the REL does not automatically indicate an adverse health impact. AEGLs represent threshold exposure limits for the general public and are applicable to

emergency exposures ranging from 10 minutes to 8 hours.[17] They are guideline levels for "once-in-a-lifetime, short-term exposures to airborne concentrations of acutely toxic, high-priority chemicals." *Id.* at 21. The AEGL–1 is specifically defined as "the airborne concentration (expressed as ppm (parts per million) or mg/m3 (milligrams per cubic meter)) of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure." The document also notes that "Airborne concentrations below AEGL–1 represent exposure levels that can produce mild and progressively increasing but transient and nondisabling odor, taste, and sensory irritation or certain asymptomatic, nonsensory effects." *Id.* AEGL–2 are defined as "the airborne concentration (expressed as parts per million or milligrams per cubic meter) of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape." *Id.*

ERPGs are developed, by the American Industrial Hygiene Association (AIHA), for emergency planning and are intended to be health-based guideline concentrations for single exposures to chemicals. The ERPG–1 is the maximum airborne concentration, established by AIHA, below which it is believed that nearly all individuals could be exposed for up to 1 hour

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[15] In the absence of hourly emission data, we develop estimates of maximum hourly emission rates by multiplying the average actual annual emissions rates by a factor (either a category-specific factor or a default factor of 10) to account for variability. This is documented in *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule,* and in appendix 5 of the report: *Technical Support Document for Acute Risk Screening Assessment*. Both of these documents are available in the docket for this rulemaking.

[16] CalEPA issues acute RELs as part of its Air Toxics Hot Spots Program, and the 1-hour and 8-hour values are documented in *Air Toxics Hot Spots Program Risk Assessment Guidelines, Part I, The Determination of Acute Reference Exposure Levels for Airborne Toxicants*, which is available at *https://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary*.

[17] National Academy of Sciences, 2001. *Standing Operating Procedures for Developing Acute Exposure Levels for Hazardous Chemicals*, page 2. Available at *https://www.epa.gov/sites/production/files/2015-09/documents/sop_final_standing_operating_procedures_2001.pdf*. Note that the National Advisory Committee for Acute Exposure Guideline Levels for Hazardous Substances ended in October 2011, but the AEGL program continues to operate at the EPA and works with the National Academies to publish final AEGLs (*https://www.epa.gov/aegl*).

without experiencing other than mild transient adverse health effects or without perceiving a clearly defined, objectionable odor. Similarly, the ERPG–2 is the maximum airborne concentration, established by AIHA, below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.

An acute REL for 1-hour exposure durations is typically lower than its corresponding AEGL–1 and ERPG–1. Even though their definitions are slightly different, AEGL–1s are often the same as the corresponding ERPG–1s, and AEGL–2s are often equal to ERPG–2s. The maximum HQs from our acute inhalation screening risk assessment typically result when we use the acute REL for a HAP. In cases where the maximum acute HQ exceeds 1, we also report the HQ based on the next highest acute dose-response value (usually the AEGL–1 and/or the ERPG-1).

For the PEPO Production source category, we did not use a default acute emissions multiplier of 10, but rather we used process level-specific acute emissions multipliers, generally ranging from a factor of 2 to 10 as was done in past chemical and petrochemical residual risk reviews such as for the 2015 Petroleum Refinery Sector rule, 2024 HON rulemaking, 2020 MON RTR, and 2020 EMACT standards RTR, where similar emission sources and standards exist. These refinements are discussed more fully in appendix 1 of the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule,* which is available in the docket for this rulemaking.

In our acute inhalation screening risk assessment, acute impacts are deemed negligible for HAP for which acute HQs are less than or equal to 1, and no further analysis is performed for these HAP. In cases where an acute HQ from the screening step is greater than 1, we assess the site-specific data to ensure that the acute HQ is at an off-site location. For the PEPO Production source category, the data refinements employed consisted of reviewing satellite imagery of the

locations of the maximum acute HQ values to determine if the maximum was off facility property. For any maximum value that was determined to be on facility property, the next highest value that was off facility property was used. These refinements are discussed more fully in the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule*, which is available in the docket for this rulemaking.

4. How do we conduct the multipathway exposure and risk screening assessment?

The EPA conducts a tiered screening assessment examining the potential for significant human health risks due to exposures via routes other than inhalation (*e.g.*, ingestion). We first determine whether any sources in the source category emit any HAP known to be persistent and bioaccumulative in the environment, as identified in the EPA's Air Toxics Risk Assessment Library (see Volume 1, appendix D, at *https://www.epa.gov/fera/risk-assessment-and-modeling-air-toxics-risk-assessment-reference-library)*.

For the PEPO Production source category, we identified PB-HAP emissions of arsenic compounds, cadmium compounds, polycyclic organic matter (POM), and mercury, so we proceeded to the next step of the evaluation. Except for lead, the human health risk screening assessment for PB-HAP consists of three progressive tiers. In a Tier 1 screening assessment, we determine whether the magnitude of the facility-specific emissions of PB-HAP warrants further evaluation to characterize human health risk through ingestion exposure. To facilitate this step, we evaluate emissions against previously developed screening threshold emission rates for several PB-HAP that are based on a hypothetical upper-end screening exposure scenario developed for use in conjunction with the EPA's Total Risk Integrated Methodology - Fate, Transport, and Ecological Exposure (TRIM.FaTE) model. The PB-HAP with screening threshold emission rates are arsenic compounds, cadmium compounds, chlorinated dibenzodioxins and furans, mercury compounds, and POM. Based on the EPA estimates of toxicity and bioaccumulation potential, these pollutants represent a health protective list for inclusion in

multipathway risk assessments for RTR rules. (See Volume 1, Appendix D at *https://www.epa.gov/sites/production/files/2013-08/documents/volume_1_reflibrary.pdf.*) In this assessment, we compare the facility-specific emission rates of these PB-HAP to the screening threshold emission rates for each PB-HAP to assess the potential for significant human health risks via the ingestion pathway. We call this application of the TRIM.FaTE model the Tier 1 screening assessment. The ratio of a facility's actual emission rate to the Tier 1 screening threshold emission rate is a "screening value."

We derive the Tier 1 screening threshold emission rates for these PB-HAP (other than lead compounds) to correspond to a maximum excess lifetime cancer risk of 1-in-1 million (*i.e.*, for arsenic compounds, polychlorinated dibenzodioxins and furans, and POM) or, for HAP that cause noncancer health effects (*i.e.*, cadmium compounds and mercury compounds), a maximum HQ of 1. If the emission rate of any one PB-HAP or combination of carcinogenic PB-HAP in the Tier 1 screening assessment exceeds the Tier 1 screening threshold emission rate for any facility (*i.e.*, the screening value is greater than 1), we conduct a second screening assessment, which we call the Tier 2 screening assessment. The Tier 2 screening assessment separates the Tier 1 combined fisher and farmer exposure scenario into fisher, farmer, and gardener scenarios that retain upper-bound ingestion rates.

In the Tier 2 screening assessment, the location of each facility that exceeds a Tier 1 screening threshold emission rate is used to refine the assumptions associated with the Tier 1 fisher and farmer exposure scenarios at that facility. A key assumption in the Tier 1 screening assessment is that a lake and/or farm is located near the facility. As part of the Tier 2 screening assessment, we use a U.S. Geological Survey (USGS) database to identify actual waterbodies within 50 km of each facility and assume the fisher only consumes fish from lakes within that 50-km zone. We also examine the differences between local meteorology near the facility and the meteorology used in the Tier 1 screening assessment. We then adjust the previously-developed Tier 1 screening threshold emission rates for each PB-HAP for each facility based on

an understanding of how exposure concentrations estimated for the screening scenario change with the use of local meteorology and the USGS lakes database.

In the Tier 2 farmer scenario, we maintain an assumption that the farm is located within 0.5 km of the facility and that the farmer consumes meat, eggs, dairy, vegetables, and fruit produced near the facility. We may further refine the Tier 2 screening analysis by assessing a gardener scenario to characterize a range of exposures, with the gardener scenario being more plausible in RTR evaluations. Under the gardener scenario, we assume the gardener consumes home-produced eggs, vegetables, and fruit products at the same ingestion rate as the farmer. The Tier 2 screen continues to rely on the high-end food intake assumptions that were applied in Tier 1 for local fish (adult female angler at 99th percentile fish consumption[18]) and locally grown or raised foods (90th percentile consumption of locally grown or raised foods for the farmer and gardener scenarios[19]). If PB-HAP emission rates do not result in a Tier 2 screening value greater than 1, we consider those PB-HAP emissions to pose risks below a level of concern. If the PB-HAP emission rates for a facility exceed the Tier 2 screening threshold emission rates, we may conduct a Tier 3 screening assessment.

There are several analyses that can be included in a Tier 3 screening assessment, depending upon the extent of refinement warranted, including validating that the lakes are fishable, locating residential/garden locations for urban and/or rural settings, considering plume-rise to estimate emissions lost above the mixing layer, and considering hourly effects of meteorology and plume-rise on chemical fate and transport (a time-series analysis). If necessary, the EPA may further refine the screening assessment through a site-specific assessment.

In evaluating the potential multipathway risk from emissions of lead compounds, rather than developing a screening threshold emission rate, we compare maximum estimated chronic inhalation exposure concentrations to the level of the current National Ambient Air Quality

Standard (NAAQS) for lead.[20] Values below the level of the primary (health-based) lead NAAQS are considered to have a low potential for multipathway risk.

For further information on the multipathway assessment approach, see the document titled *Residual Risk Assessment for the Polyether Polyols* (*PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule*, which is available in the docket for this rulemaking.

5. How do we assess risks considering emissions control options?

In addition to assessing baseline inhalation risks and screening for potential multipathway risks, we also estimate risks considering the potential emission reductions that would be achieved by the control options under consideration. In these cases, the expected emission reductions are applied to the specific HAP and emission points in the RTR emissions dataset to develop corresponding estimates of risk and incremental risk reductions.

6. How do we conduct the environmental risk screening assessment?

a. Adverse Environmental Effect, Environmental HAP, and Ecological Benchmarks

The EPA conducts a screening assessment to examine the potential for an adverse environmental effect as required under section 112(f)(2)(A) of the CAA. Section 112(a)(7) of the CAA defines “adverse environmental effect” as “any significant and widespread adverse effect, which may reasonably be anticipated, to wildlife, aquatic life, or other natural resources, including adverse impacts on populations of endangered or threatened species or significant degradation of environmental quality over broad areas.”

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[18] Burger, J. 2002. *Daily consumption of wild fish and game: Exposures of high end recreationists. International Journal of Environmental Health Research,* 12:343–354.

[19] U.S. EPA. *Exposure Factors Handbook 2011 Edition (Final)*. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R–09/052F, 2011.

[20] In doing so, the EPA notes that the legal standard for a primary NAAQS – that a standard is requisite to protect public health and provide an adequate margin of safety (CAA section 109(b)) – differs from the CAA section 112(f) standard (requiring, among other things, that the standard provide an “ample margin of safety to protect public health”). However, the primary lead NAAQS is a reasonable measure of determining risk acceptability (*i.e.*, the first step of the 1989 Benzene NESHAP analysis) since it is designed to protect the most susceptible group in the human population – children, including children living near major lead emitting sources. 73 FR 67002/3; 73 FR 67000/3; 73 FR 67005/1. In addition, applying the level of the primary lead NAAQS at the risk acceptability step is conservative, since that primary lead NAAQS reflects an adequate margin of safety.

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 included in the screening assessment are arsenic compounds, cadmium compounds, dioxins/furans, POM, mercury (both inorganic mercury and methyl mercury), and lead compounds. The acid gases included in the screening assessment are hydrochloric acid (HCl) and hydrofluoric acid (HF).

HAP that persist and bioaccumulate are of particular environmental concern because they accumulate in the soil, sediment, and water. The acid gases, HCl and HF, are included due to their well-documented potential to cause direct damage to terrestrial plants. In the environmental risk screening assessment, we evaluate the following four exposure media: terrestrial soils, surface water bodies (includes water-column and benthic sediments), fish consumed by wildlife, and air. Within these four exposure media, we evaluate nine ecological assessment endpoints, which are defined by the ecological entity and its attributes. For PB-HAP (other than lead), both community-level and population-level endpoints are included. For acid gases, the ecological assessment evaluated is terrestrial plant communities.

An ecological benchmark represents a concentration of HAP that has been linked to a particular environmental effect level. For each environmental HAP, we identified the available ecological benchmarks for each assessment endpoint. We identified, where possible, ecological benchmarks at the following effect levels: probable effect levels, lowest-observed-adverse-effect level, and no-observed-adverse-effect level. In cases where multiple effect levels were available for a particular PB-HAP and assessment endpoint, we use all of the available effect levels to help us to determine whether ecological risks exist and, if so, whether the risks could be considered significant and widespread.

For further information on how the environmental risk screening assessment was conducted, including a discussion of the risk metrics used, how the environmental HAP were identified, and how the ecological benchmarks were selected, see appendix 9 of the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category*

in Support of the 2024 Risk and Technology Review Proposed Rule, which is available in the docket for this rulemaking.

b. Environmental Risk Screening Methodology

For the environmental risk screening assessment, the EPA first determined whether any facilities in the PEPO Production source category emitted any of the environmental HAP. For the PEPO Production source category, we identified emissions of arsenic compounds, cadmium compounds, POM, and mercury.[21] Because one or more of the environmental HAP evaluated are emitted by at least one facility in the PEPO Production source category, we proceeded to the second step of the evaluation.

c. PB-HAP Methodology

The environmental screening assessment includes six PB-HAP, arsenic compounds, cadmium compounds, dioxins/furans, POM, mercury (both inorganic mercury and methyl mercury), and lead compounds. With the exception of lead, the environmental risk screening assessment for PB-HAP consists of three tiers. The first tier of the environmental risk screening assessment uses the same health-protective conceptual model that is used for the Tier 1 human health screening assessment. TRIM.FaTE model simulations were used to back-calculate Tier 1 screening threshold emission rates. The screening threshold emission rates represent the emission rate in tons of pollutant per year that results in media concentrations at the facility that equal the relevant ecological benchmark. To assess emissions from each facility in the category, the reported emission rate for each PB-HAP was compared to the Tier 1 screening threshold emission rate for that PB-HAP for each assessment endpoint and effect level. If emissions from a facility do not exceed the Tier 1 screening threshold emission rate, the facility "passes" the screening assessment, and, therefore, is not evaluated further under the screening approach. If

[21] We note that in many instances, we did not have sufficient information to parse out emissions from PEPO processes from facility-wide emissions inventories; thus, to avoid underestimating emissions from PEPO sources, we modeled most or all of certain facilities' emissions records as if they all are from the PEPO Production source category.

emissions from a facility exceed the Tier 1 screening threshold emission rate, we evaluate the facility further in Tier 2.

In Tier 2 of the environmental screening assessment, the screening threshold emission rates are adjusted to account for local meteorology and the actual location of lakes in the vicinity of facilities that did not pass the Tier 1 screening assessment. For soils, we evaluate the average soil concentration for all soil parcels within a 7.5-km radius for each facility and PB-HAP. For the water, sediment, and fish tissue concentrations, the highest value for each facility for each pollutant. If emissions from a facility do not exceed the Tier 2 screening threshold emission rate, the facility "passes" the screening assessment and typically is not evaluated further. If emissions from a facility exceed the Tier 2 screening threshold emission rate, we evaluate the facility further in Tier 3.

As in the multipathway human health risk assessment, in Tier 3 of the environmental screening assessment, we examine the suitability of the lakes around the facilities to support life and remove those that are not suitable (*e.g.*, lakes that have been filled in or are industrial ponds), adjust emissions for plume rise, and conduct hour-by-hour time-series assessments. If these Tier 3 adjustments to the screening threshold emission rates still indicate the potential for an adverse environmental effect (*i.e.*, facility emission rate exceeds the screening threshold emission rate), we may elect to conduct a more refined assessment using more site-specific information. If, after additional refinement, the facility emission rate still exceeds the screening threshold emission rate, the facility may have the potential to cause an adverse environmental effect.

To evaluate the potential for an adverse environmental effect from lead, we compared the average modeled air concentrations (from HEM-4) of lead around each facility in the source category to the level of the secondary NAAQS for lead. The secondary lead NAAQS is a reasonable means of evaluating environmental risk because it is set to provide substantial protection against adverse welfare effects which can include "effects on soils, water, crops,

vegetation, man-made 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."

d. Acid Gas Environmental Risk Methodology

The environmental screening assessment for acid gases evaluates the potential phytotoxicity and reduced productivity of plants due to chronic exposure to HF and HCl. The environmental risk screening methodology for acid gases is a single-tier screening assessment that compares modeled ambient air concentrations (from AERMOD) to the ecological benchmarks for each acid gas. To identify a potential adverse environmental effect (as defined in section 112(a)(7) of the CAA) from emissions of HF and HCl, we evaluate the following metrics: the size of the modeled area around each facility that exceeds the ecological benchmark for each acid gas, in acres and square km; the percentage of the modeled area around each facility that exceeds the ecological benchmark for each acid gas; and the area-weighted average screening value around each facility (calculated by dividing the area-weighted average concentration over the 50-km modeling domain by the ecological benchmark for each acid gas). For further information on the environmental screening assessment approach, see appendix 9 of the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule*, which is available in the docket for this rulemaking.

7. How do we conduct facility-wide assessments?

To put the source category risks in context, we typically examine the risks from the entire "facility," where the facility includes all HAP-emitting operations within a contiguous area and under common control. In other words, we examine the HAP emissions not only from the source category emission points of interest, but also emissions of HAP from all other emission sources at the facility for which we have data. For the PEPO Production source category, we conducted the facility-wide assessment using a dataset compiled from the 2017 NEI and other emissions

information discussed in section II.C of this preamble. Once a quality assured source category dataset was available, it was placed back with the remaining records from the NEI for that facility (which in most instances was 2017 NEI data). The facility-wide file was then used to analyze risks due to the inhalation of HAP that are emitted "facility-wide" for the populations residing within 50 km of each facility, consistent with the methods used for the source category analysis described above. For these facility-wide risk analyses, the modeled source category risks were compared to the facility-wide risks to determine the portion of the facility-wide risks that could be attributed to the source category addressed in this proposal. We also specifically examined the facility that was associated with the highest estimate of risk and determined the percentage of that risk attributable to the source category of interest. The document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule*, available through the docket for this rulemaking, provides the methodology and results of the facility-wide analyses, including all facility-wide risks and the percentage of source category contribution to facility-wide risks.

8. How do we conduct community-based risk assessments?

In addition to the source category and facility-wide risk assessments, we also assessed the combined inhalation cancer risk from all local stationary sources of HAP for which we have emissions data. Specifically, we combined the modeled impacts from the facility-wide assessment (which includes category and non-category sources) with other nearby stationary point source model results. Section II.C of this preamble discusses the facility-wide emissions used in this assessment. For the other nearby point sources, we used AERMOD model results with emissions based primarily on the 2020 NEI. After combining these model results, we assessed cancer risks due to the inhalation of all HAP emitted by point sources for the populations residing within 10 km (~6.2 miles) of PEPO facilities. In the community-based risk assessment, we compared the modeled source category and facility-wide cancer risks to the cancer risks from other nearby point sources to determine the portion of the risks that could be

attributed to the source category addressed in this proposal. The document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule*, which is available in the docket for this rulemaking, provides the methodology and results of the community-based risks analyses.

9. How do we consider uncertainties in risk assessment?

Uncertainty and the potential for bias are inherent in all risk assessments, including those performed for this proposal. Although uncertainty exists, we believe that our approach, which used health protective tools and assumptions, ensures that our decisions are health and environmentally protective. A brief discussion of the uncertainties in the RTR emissions dataset, dispersion modeling, inhalation exposure estimates, and dose-response relationships follows below. Also included are those uncertainties specific to our acute screening assessments, multipathway screening assessments, and our environmental risk screening assessments. A more thorough discussion of these uncertainties is included in the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule*, which is available in the docket for this rulemaking. If a multipathway site-specific assessment was performed for this source category, a full discussion of the uncertainties associated with that assessment can be found in appendix 11 of that document, *Site-Specific Human Health Multipathway Residual Risk Assessment Report*.

a. Uncertainties in the RTR Emissions Dataset

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

assessment were based on an emission adjustment factor applied to the average annual hourly emission rates, which are intended to account for emission fluctuations due to normal facility operations.

b. Uncertainties in Dispersion Modeling

We recognize there is uncertainty in ambient concentration estimates associated with any model, including the EPA's recommended regulatory dispersion model, AERMOD. In using a model to estimate ambient pollutant concentrations, the user chooses certain options to apply. For RTR assessments, we select some model options that have the potential to overestimate ambient air concentrations (*e.g.*, not including plume depletion or pollutant transformation). We select other model options that have the potential to underestimate ambient impacts (*e.g.*, not including building downwash). Other options that we select have the potential to either under- or overestimate ambient levels (*e.g.*, meteorology and receptor locations). On balance, considering the directional nature of the uncertainties commonly present in ambient concentrations estimated by dispersion models, the approach we apply in the RTR assessments should yield unbiased estimates of ambient HAP concentrations. We also note that the selection of meteorology dataset location could have an impact on the risk estimates. As we continue to update and expand our library of meteorological station data used in our risk assessments, we expect to reduce this variability.

c. Uncertainties in Inhalation Exposure Assessment

Although every effort is made to identify all of the relevant facilities and emission points, as well as to develop accurate estimates of the annual emission rates for all relevant HAP, the uncertainties in our emissions inventory likely dominate the uncertainties in the exposure assessment. Some uncertainties in our exposure assessment include human mobility, using the centroid of each census block, assuming lifetime exposure, and assuming only outdoor exposures. For most of these factors, there is neither an under nor overestimate when looking at the maximum individual risk or the incidence, but the shape of the distribution of risks may be

affected. With respect to outdoor exposures, actual exposures may not be as high if people spend time indoors, especially for very reactive pollutants or larger particles. For all factors, we reduce uncertainty when possible. For example, with respect to census-block centroids, we analyze large blocks using aerial imagery and adjust locations of the block centroids to better represent the population in the blocks. We also add additional receptor locations where the population of a block is not well represented by a single location.

d. Uncertainties in Dose-Response Relationships

There are uncertainties inherent in the development of the dose-response values used in our risk assessments for cancer effects from chronic exposures and noncancer effects from both chronic and acute exposures. Some uncertainties are generally expressed quantitatively, and others are generally expressed in qualitative terms. We note, as a preface to this discussion, a point on dose-response uncertainty that is stated in the EPA's *2005 Guidelines for Carcinogen Risk Assessment*; namely, that "the primary goal of EPA actions is protection of human health; accordingly, as an Agency policy, risk assessment procedures, including default options that are used in the absence of scientific data to the contrary, should be health protective" (the EPA's *2005 Guidelines for Carcinogen Risk Assessment*, page 1-7). This is the approach followed here as summarized in the next paragraphs.

Cancer UREs used in our risk assessments are those that have been developed to generally provide an upper bound estimate of risk.[22] That is, they represent a "plausible upper limit to the true value of a quantity" (although this is usually not a true statistical confidence limit). In some circumstances, the true risk could be as low as zero; however, in other circumstances the risk could be greater.[23] Chronic noncancer RfC and reference dose values represent chronic exposure levels that are intended to be health-protective levels. To derive dose-

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[22] IRIS glossary (*https://ofmpub.epa.gov/sor_internet/registry/termreg/searchandretrieve/glossariesandkeywordlists/search.do?details=&glossaryName=IRIS%20Glossary*).

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

response values that are intended to be "without appreciable risk," the methodology relies upon an uncertainty factor (UF) approach,[24] which considers uncertainty, variability, and gaps in the available data. The UFs are applied to derive dose-response values that are intended to protect against appreciable risk of deleterious effects.

Many of the UFs used to account for variability and uncertainty in the development of acute dose-response values are quite similar to those developed for chronic durations. Additional adjustments are often applied to account for uncertainty in extrapolation from observations at one exposure duration (*e.g.*, 4 hours) to derive an acute dose-response value at another exposure duration (*e.g.*, 1 hour). Not all acute dose-response values are developed for the same purpose, and care must be taken when interpreting the results of an acute assessment of human health effects relative to the dose-response value or values being exceeded. Where relevant to the estimated exposures, the lack of acute dose-response values at different levels of severity should be factored into the risk characterization as potential uncertainties.

Uncertainty also exists in the selection of ecological benchmarks for the environmental risk screening assessment. We established a hierarchy of preferred benchmark sources to allow selection of benchmarks for each environmental HAP at each ecological assessment endpoint. We searched for benchmarks for three effect levels (*i.e.*, no-effects level, threshold-effect level, and probable-effect level), but not all combinations of ecological assessment/environmental HAP had benchmarks for all three effect levels. Where multiple effect levels were available for a particular HAP and assessment endpoint, we used all of the available effect levels to help us determine whether risk exists and whether the risk could be considered significant and widespread.

Although we make every effort to identify appropriate human health effect dose-response values for all pollutants emitted by the sources in this risk assessment, some HAP emitted by the

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[24] See *A Review of the Reference Dose and Reference Concentration Processes*, U.S. EPA, December 2002, and *Methods for Derivation of Inhalation Reference Concentrations and Application of Inhalation Dosimetry*, U.S. EPA, 1994.

source category are lacking dose-response assessments. Accordingly, these pollutants cannot be included in the quantitative risk assessment, which could result in quantitative estimates understating HAP risk. To help to alleviate this potential underestimate, where we conclude similarity with a HAP for which a dose-response value is available, we use that value as a surrogate for the assessment of the HAP for which no value is available. To the extent use of surrogates indicates appreciable risk, we may identify a need to increase priority for an IRIS assessment for that substance. We additionally note that, generally speaking, HAP of greatest concern due to environmental exposures and hazard are those for which dose-response assessments have been performed, reducing the likelihood of understating risk. Further, HAP not included in the quantitative assessment are assessed qualitatively and considered in the risk characterization that informs the risk management decisions, including consideration of HAP reductions achieved by various control options.

For a group of compounds that are unspeciated (*e.g.*, groups of compounds that we do not know the exact composition of like glycol ethers), we conservatively use the most protective dose-response value of an individual compound in that group to estimate risk. Similarly, for an individual compound in a group (*e.g.*, ethylene glycol diethyl ether) that does not have a specified dose-response value, we also apply the most protective dose-response value from the other compounds in the group to estimate risk.

e. Uncertainties in Acute Inhalation Screening Assessments

In addition to the uncertainties highlighted above, there are several factors specific to the acute exposure assessment that the EPA conducts as part of the risk review under section 112 of the CAA. The accuracy of an acute inhalation exposure assessment depends on the simultaneous occurrence of independent factors that may vary greatly, such as hourly emissions rates, meteorology, and the presence of a person. In the acute screening assessment that we conduct under the RTR program, we assume that peak emissions from the source category and reasonable worst-case air dispersion conditions (*i.e.*, 99th percentile) co-occur. We then include the

additional assumption that a person is located at this point at the same time. Together, these assumptions represent a reasonable worst-case actual exposure scenario. In most cases, it is unlikely that a person would be located at the point of maximum exposure during the time when peak emissions and reasonable worst-case air dispersion conditions occur simultaneously.

f. Uncertainties in the Multipathway and Environmental Risk Screening Assessments

For each source category, we generally rely on site-specific levels of PB-HAP or environmental HAP emissions to determine whether a refined assessment of the impacts from multipathway exposures is necessary or whether it is necessary to perform an environmental screening assessment. This determination is based on the results of a three-tiered screening assessment that relies on the outputs from models – TRIM.FaTE and AERMOD – that estimate environmental pollutant concentrations and human exposures for five PB-HAP (dioxins, POM, mercury, cadmium, and arsenic) and two acid gases (HF and HCl). For lead, we use AERMOD to determine ambient air concentrations, which are then compared to the secondary NAAQS standard for lead. Two important types of uncertainty associated with the use of these models in RTR risk assessments and inherent to any assessment that relies on environmental modeling are model uncertainty and input uncertainty.[25]

Model uncertainty concerns whether the model adequately represents the actual processes (*e.g.*, movement and accumulation) that might occur in the environment. For example, does the model adequately describe the movement of a pollutant through the soil? This type of uncertainty is difficult to quantify. However, based on feedback received from previous EPA SAB reviews and other reviews, we are confident that the models used in the screening assessments are appropriate and state-of-the-art for the multipathway and environmental screening risk assessments conducted in support of RTRs.

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[25] In the context of this discussion, the term "uncertainty" as it pertains to exposure and risk encompasses both ***variability*** in the range of expected inputs and screening results due to existing spatial, temporal, and other factors, as well as ***uncertainty*** in being able to accurately estimate the true result.

Input uncertainty is concerned with how accurately the models have been configured and parameterized for the assessment at hand. For Tier 1 of the multipathway and environmental screening assessments, we configured the models to avoid underestimating exposure and risk. This was accomplished by selecting upper-end values from nationally representative datasets for the more influential parameters in the environmental model, including selection and spatial configuration of the area of interest, lake location and size, meteorology, surface water, soil characteristics, and structure of the aquatic food web. We also assume an ingestion exposure scenario and values for human exposure factors that represent reasonable maximum exposures.

In Tier 2 of the multipathway and environmental screening assessments, we refine the model inputs to account for meteorological patterns in the vicinity of the facility versus using upper-end national values, and we identify the actual location of lakes near the facility rather than the default lake location that we apply in Tier 1. By refining the screening approach in Tier 2 to account for local geographical and meteorological data, we decrease the likelihood that concentrations in environmental media are overestimated, thereby increasing the usefulness of the screening assessment. In Tier 3 of the screening assessments, we refine the model inputs again to account for hour-by-hour plume-rise and the height of the mixing layer. We can also use those hour-by-hour meteorological data in a TRIM.FaTE run using the screening configuration corresponding to the lake location. These refinements produce a more accurate estimate of chemical concentrations in the media of interest, thereby reducing the uncertainty with those estimates. The assumptions and the associated uncertainties regarding the selected ingestion exposure scenario are the same for all three tiers.

For the environmental screening assessment for acid gases, we employ a single-tiered approach. We use the modeled air concentrations and compare those with ecological benchmarks.

For all tiers of the multipathway and environmental screening assessments, our approach to addressing model input uncertainty is generally cautious. We choose model inputs from the

upper end of the range of possible values for the influential parameters used in the models, and we assume that the exposed individual exhibits ingestion behavior that would lead to a high total exposure. This approach reduces the likelihood of not identifying high risks for adverse impacts.

Despite the uncertainties, when individual pollutants or facilities do not exceed screening threshold emission rates (*i.e.*, screen out), we are confident that the potential for adverse multipathway impacts on human health is very low. On the other hand, when individual pollutants or facilities do exceed screening threshold emission rates, it does not mean that impacts are significant, only that we cannot rule out that possibility and that a refined assessment for the site might be necessary to obtain a more accurate risk characterization for the source category.

The EPA evaluates the following HAP in the multipathway and/or environmental risk screening assessments, where applicable: arsenic, cadmium, dioxins/furans, lead, mercury (both inorganic and methyl mercury), POM, HCl, and HF. These HAP represent pollutants that can cause adverse impacts either through direct exposure to HAP in the air or through exposure to HAP that are deposited from the air onto soils and surface waters and then through the environment into the food web. These HAP represent those HAP for which we can conduct a meaningful multipathway or environmental screening risk assessment. For other HAP not included in our screening assessments, the model has not been parameterized such that it can be used for that purpose. In some cases, depending on the HAP, we may not have appropriate multipathway models that allow us to predict the concentration of that pollutant. The EPA acknowledges that other HAP beyond these that we are evaluating may have the potential to cause adverse effects and, therefore, the EPA may evaluate other relevant HAP in the future, as modeling science and resources allow.

C. How do we perform the technology review?

Our technology review primarily focuses on the identification and evaluation of developments in practices, processes, and control technologies that have occurred since the

previous PEPO NESHAP technology review was 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 CAA section 112 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 MACT standards;
- Any improvements in add-on control technology or other equipment (that were identified and considered during development of the original MACT 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 MACT 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 MACT 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 MACT standards).

In addition to reviewing the practices, processes, and control technologies that were considered at the time we originally developed (or last updated) the PEPO NESHAP, we review a variety of data sources in our investigation of potential practices, processes, or controls to consider. We also review the NESHAP and the available data to determine if there are any unregulated emissions of HAP within the source category, and evaluate these data for use in

developing new emission standards. See sections II.C and II.D of this preamble for information on the specific data sources that were reviewed as part of the technology review.

D. How do we determine a MACT floor and consider beyond-the-floor?

MACT standards must reflect the maximum degree of emissions reduction achievable through the application of measures, processes, methods, systems or techniques, including, but not limited to, measures that (1) reduce the volume of or eliminate pollutants through process changes, substitution of materials or other modifications; (2) enclose systems or processes to eliminate emissions; (3) capture or treat pollutants when released from a process, stack, storage or fugitive emissions point; (4) are design, equipment, work practice or operational standards (including requirements for operator training or certification); or (5) are a combination of the above. CAA section 112(d)(2)(A)–(E). The MACT standards may take the form of design, equipment, work practice or operational standards where the EPA first determines either that (1) a pollutant cannot be emitted through a conveyance designed and constructed to emit or capture the pollutant, or that any requirement for, or use of, such a conveyance would be inconsistent with law; or (2) the application of measurement methodology to a particular class of sources is not practicable due to technological and economic limitations. CAA section 112(h)(1)–(2).

The MACT ‘‘floor’’ is the minimum control level allowed for MACT standards promulgated under CAA section 112(d)(3) and may not be based on cost considerations. For new sources located at facilities that are major sources of HAP, section 112 of the CAA requires the EPA to establish standards that are no less stringent than the emissions control that is achieved in practice by the best controlled similar source. The statute does not define “achieved in practice” nor does it dictate the manner in which the agency determines which source is the best controlled similar source, instead leaving it to the agency’s discretion to make those determinations. For existing sources located at facilities that are major sources of HAP, standards must be no less stringent than the average emissions limitation achieved by the best performing sources for which the EPA has emissions information. Again, the CAA leaves to the EPA’s discretion the

manner in which to calculate "the average emission limitation achieved" by the best performing sources. Under section 112, the CAA recognizes that source categories and subcategories have differing numbers of sources and provides category size-specific instructions on determining standard stringency for existing sources. Specifically, standards for categories or subcategories with fewer than 30 sources must be based on the average emission limitation achieved by the best performing 5 sources, and standards for categories or subcategories with 30 or more sources must be based on the average emission limitation achieved by the best performing 12 percent of sources for which the EPA has emissions information. In developing MACT standards, the EPA must also consider control options that are more stringent than the floor (*i.e.*, ''beyond-the-floor'' options) under CAA section 112(d)(2). We may establish beyond-the-floor standards more stringent than the floor based on considerations of the cost of achieving the emission reductions, any non-air quality health and environmental impacts, and energy requirements.

IV. Analytical Results and Proposed Decisions

A. What are the results of the risk assessment and analyses?

As previously discussed, we conducted a risk assessment for the PEPO Production source category. We previously identified EtO as a cancer risk driver from facilities with PEPO NESHAP-subject processes in the first risk assessment we conducted in 2014. However, the EPA's IRIS inhalation URE for EtO was revised in 2016,[26] based on new data, showing EtO to be more carcinogenic than previously understood (*i.e.*, resulting in a URE 60 times greater than the previous URE over a 70-year lifetime). We briefly present the results of the risk assessment below and in more detail in the document titled *Residual Risk Assessment for the* Polyether Polyols (*PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule*, which is available in the docket for this rulemaking.

1. Chronic Inhalation Risk Assessment Results

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[26] U.S. EPA. *Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide (CASRN 75-21-8) In Support of Summary Information on the Integrated Risk Information System (IRIS).* December 2016. EPA/635/R-16/350Fa. Available at: *https://cfpub.epa.gov/ncea/iris/iris_documents/documents/toxreviews/1025tr.pdf*.

Out of the 25 facilities identified as subject to the PEPO NESHAP, two facilities do not have source category emissions included in our risk assessment. One facility has a PEPO source under construction while the other facility did not report records in its emissions inventory with names that that could be linked to its PEPO process and thus we did not have sufficient information to parse out the source category records.[27] The results of the chronic baseline inhalation cancer risk assessment, which are estimated using modeling and is the case for all risk results presented here and in subsequent sections, indicate that, based on estimates of current actual emissions, the MIR posed by the source category is 1,000-in-1 million, driven by EtO emissions from wastewater (77 percent) and equipment leaks (21 percent). The total estimated cancer incidence based on actual emission levels is 0.3 excess cancer cases per year (or 1 cancer case every 3.3 years). EtO emissions contribute 99.6 percent of the total cancer incidence. Within 50 km of PEPO NESHAP-subject facilities, the population exposed to cancer risk greater than 100-in-1 million for PEPO NESHAP actual emissions is approximately 3,300 people, and the population exposed to cancer risk greater than or equal to 1-in-1 million is approximately 3.8 million people. Of the 23 facilities that the EPA assessed for source category risk, 6 facilities have an estimated maximum cancer risk greater than 100-in-1 million. In addition, the maximum modeled chronic noncancer TOSHI for the source category based on actual emissions is estimated to be 0.1 (for respiratory effects). No populations are estimated to be exposed to a TOSHI greater than 1.

Of the 23 facilities that the EPA assessed for the source category risk, 5 facilities have allowable emissions that differ from the actual emissions (see section III.B.2 of this preamble). For the other 18 facilities, actual emissions equal allowable emissions, and therefore, actual risks equal allowable risks for these 18 facilities. Our risk assessment based on allowable emissions includes all 23 facilities. This assessment estimates the MIR posed by the source category is

[27] When considering all emissions reported by the facility for which we could not identify PEPO emissions records, we estimated a facility-wide maximum cancer risk of 70-in-1 million, so including this facility in the PEPO source category risk assessment would not have changed our decisions on standards to address unacceptable risk.

unchanged at 1,000-in-1 million, driven by EtO emissions from wastewater (77 percent) and equipment leaks (21 percent). The total estimated cancer incidence is 0.4 excess cancer cases per year (or 1 cancer case every 2.5 years). EtO emissions contribute 99.6 percent of the total cancer incidence. Within 50 km of PEPO NESHAP-subject facilities, the population exposed to cancer risk greater than 100-in-1 million for PEPO NESHAP allowable emissions is approximately 6,700 people, and the population exposed to cancer risk greater than or equal to 1-in-1 million is approximately 4.7 million people. Of the 23 facilities that the EPA assessed for source category risk, 8 facilities have an estimated maximum cancer risk greater than 100-in-1 million. In addition, the EPA estimated the maximum modeled chronic noncancer TOSHI for the source category based on allowable emissions to be less than 1.

See table 1 of this preamble for a summary of the PEPO NESHAP inhalation risk assessment results.

Table 1. PEPO Production Source Category Inhalation Risk Assessment Results Based on Actual and Allowable Emissions[1]

Risk Assessment	Number of Facilities[2]	Maximum Individual Cancer Risk (-in-1 million)[3]	Estimated Population at Increased Risk of Cancer		Estimated Annual Cancer Incidence (cases per year)	Maximum Chronic Noncancer TOSHI	Refined Maximum Screening Acute Noncancer HQ
			≥ 1-in-1 million	> 100-in-1 million			
Baseline (Pre-control) Actual Emissions							
Source Category	23	1,000	3.8 million	3,300	0.3	0.1 (respiratory)	1
Facility-wide[4]	25	2,000	7.3 million	4,000	0.6	3 (respiratory)	--
Baseline (Pre-control) Allowable Emissions							
Source Category[1]	23	1,000	4.7 million	6,700	0.4	0.1 (respiratory)	--

[1] There are allowable emissions for 5 facilities. For the other 18 facilities, actual emissions equal allowable emissions.
[2] There are 25 PEPO production facilities; however, only 23 of these facilities are included in the source category risk assessment based on available data.
[3] Maximum individual excess lifetime cancer risk due to HAP emissions.
[4] See "Facility-Wide Risk Results" in section IV.A.5 of this preamble for more details on this risk assessment.

2. Screening Level Acute Risk Assessment Results

As presented in table 1 of this preamble, the estimated worst-case off-site acute inhalation exposures to emissions from the PEPO Production source category result in a maximum modeled

acute noncancer HQ equal to 1 based on the REL for methoxytriglycol (a glycol ether). Acute impacts are deemed negligible for HAP for which acute HQs are less than or equal to 1, and no further analysis is performed for these HAP. The main body and appendix 10 of the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule*, which is available in the docket for this rulemaking, provides detailed information about the assessment, including evaluation of the screening-level acute risk assessment results.

3. Multipathway Risk Screening Results

For the PEPO Production source category, three facilities emitted at least 1 PB-HAP, including arsenic, cadmium, mercury, and POM.[28] Emissions of these PB-HAP from each facility were compared to the respective pollutant-specific Tier 1 screening emission thresholds. The Tier 1 screening analysis for PB-HAP (other than lead, which was evaluated differently), indicated no facilities exceeded the Tier 1 emission threshold for arsenic, cadmium, mercury, or POM.

In evaluating the potential for multipathway risk from emissions of lead, the modeled maximum annual ambient lead concentration (0.000002 $\mu g/m^3$) was compared to the NAAQS for lead (0.15 $\mu g/m^3$, 3-month rolling average). We did not estimate any exceedance of the NAAQS for lead. The modeled maximum annual lead concentration is well below the NAAQS for lead, indicating low potential for multipathway risk of concern due to lead emissions.

Detailed information about the assessment is provided in the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the*

[28] Note that while the multipathway risk screening results includes metals (*e.g.*, arsenic, cadmium, mercury) and POM, the EPA used a health-protective approach and included emissions inventory records that were not clearly labeled (not easily categorized) in modeling of emissions from the PEPO Production source category. This means that emissions from other source categories were likely included for this analysis in certain instances. We have no information suggesting that metals or POM are emitted from PEPO processes. See appendix 1 of the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule*, which is available in the docket for this rulemaking, for more details about development of the risk modeling file.

2024 Risk and Technology Review Proposed Rule, which is available in the docket for this rulemaking.

4. Environmental Risk Screening Results

As described in section IV.A of this preamble, we conducted a screening assessment for adverse environmental effects for the PEPO Production source category. The environmental screening assessment included the following HAP: arsenic, cadmium, methyl mercury, divalent mercury, and POM.[29]

In the Tier 1 screening analysis for PB-HAP (other than lead, which was evaluated differently), none of the PB-HAP had exceedances for any ecological benchmark.

In evaluating the potential adverse environmental risks associated with emissions of lead, the modeled maximum annual ambient lead concentration (0.000002 $\mu g/m^3$) was compared to the NAAQS for lead (0.15 $\mu g/m^3$, 3-month rolling average). We did not estimate any exceedance of the NAAQS for lead. The modeled maximum annual lead concentration is well below the NAAQS for lead, indicating low potential for environmental risk of concern due to lead emissions.

We also conducted an environmental risk screening assessment specifically for acid gases (*i.e.*, HCl and HF) for the PEPO Production source category. There are no facilities with HF emissions. There are three facilities with HCl emissions. For HCl, 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

[29] Note that while the environmental risk screening results includes metals (*e.g.*, arsenic, cadmium, lead, mercury), POM, and acid gases (*e.g.*, HCl), the EPA used a health-protective approach and included emissions inventory records that were not clearly labeled (not easily categorized) in modeling of emissions from the PEPO Production source category to avoid underestimating emissions from PEPO sources. This means that emissions from other source categories were likely included for this analysis in certain instances. We have no information suggesting that metals, POM, or HCl are emitted from PEPO processes. See appendix 1 of the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule*, which is available in the docket for this rulemaking, for more details about development of the risk modeling file.

modeled concentration of HCl (*i.e.*, each off-site data point in the modeling domain) was below the ecological benchmarks for all facilities.

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. Detailed information about the assessments is provided in the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule,* which is available in the docket for this rulemaking.

5. Facility-Wide Risk Results

We assessed facility-wide risk, as described in section III.B.7 of this preamble, to characterize the source category risk in the context of "whole facility" risk using the NEI-based data described in section II.C of this preamble. Facility-wide risk was modeled using post-control emissions from the processes subject to the HON to reflect the emissions reductions expected from the HON rulemaking that was signed in early 2024 (89 FR 42932). The maximum lifetime individual cancer risk posed by the 25 modeled facilities based on facility-wide emissions is 2,000-in-1 million with EtO emissions from wastewater (72 percent) and equipment leaks (20 percent) from PEPO production source category emissions driving the risk. The total estimated cancer incidence based on facility-wide emission levels is 0.6 excess cancer cases per year. EtO emissions contribute 94 percent of the total cancer incidence. Within 50 km of PEPO NESHAP-subject facilities, the population exposed to cancer risk greater than 100-in-1 million for PEPO facility-wide emissions is approximately 4,000 people, and the population exposed to cancer risk greater than or equal to 1-in-1 million is approximately 7.3 million people. The maximum chronic noncancer TOSHI due to facility-wide emissions is estimated to be 3 (for respiratory effects) due to emissions of chlorine from 1 facility. A different facility has a chronic noncancer TOSHI of 2 (for respiratory effects) due to facility-wide emissions of maleic anhydride. Approximately 60 people are estimated to be exposed to a TOSHI greater than 1 due to facility-wide emissions. Of the approximately 60 people, 44 people are exposed to a TOSHI of

3 due to emissions of chlorine and 16 people are exposed to a TOSHI of 2 due to emissions of maleic anhydride.

After the controls proposed in this action are implemented for the PEPO Production source category (see section IV.B.2 of this preamble), the post-control facility-wide cancer risk remains greater than 100-in-1 million at two facilities.

6. Community-Based Risk Assessment

We also conducted a community-based risk assessment for PEPO NESHAP-subject facilities. The goal of this assessment was to estimate cancer risk from HAP emitted from all local stationary point sources for which we have emissions data. We estimated the overall inhalation cancer risk due to emissions from all stationary point sources impacting census blocks within 10 km of the 25 PEPO production facilities. Specifically, we combined the modeled impacts from category and non-category HAP sources at PEPO production facilities, as well as other stationary point source HAP emissions. Within 10 km of PEPO NESHAP-subject facilities, we identified 823 non-source category facilities that could potentially also contribute to HAP inhalation exposures. Similar to the facility-wide risk assessment, the community-based risk assessment uses post-control emissions from the processes subject to the HON to reflect the emissions reductions expected from the HON rulemaking that was signed in early 2024 (89 FR 42932).

We first looked at what the maximum cancer risk is for communities around PEPO production facilities. The results indicate that the community-level maximum individual cancer risk is the same as both the source category MIR and the maximum individual cancer risk for the facility-wide assessment, 2,000-in-1 million. The community-based risk assessment estimated that greater than 99 percent of the community-level maximum individual cancer risk is attributable to emissions from PEPO production facilities (including both source category and non-category emissions). We then looked at the risks to the communities from all emissions sources for which we had data. Within 10 km, the population exposed to cancer risks greater than

100-in-1 million from all nearby emissions is approximately 5,300. For comparison, approximately 3,300 people have cancer risks greater than 100-in-1 million due to PEPO production emissions and approximately 4,000 people have cancer risks greater than 100-in-1 million due to PEPO facility-wide emissions (see table 2 of this preamble). The overall cancer incidence for this exposed population (*i.e.*, populations with risks greater than 100-in-1 million living within 10 km of PEPO production facilities) is 0.02, with 84 percent of the cancer incidence from PEPO production processes, 9 percent from non-PEPO processes at PEPO production facilities (a total of 93 percent from PEPO production facilities), and 7 percent from other nearby stationary point sources that are not PEPO production facilities.

The population exposed to cancer risks greater than or equal to 1-in-1 million in the community-based assessment is approximately 1.2 million people. For comparison, approximately 830,000 people have cancer risks greater than or equal to 1-in-1 million due to PEPO production process emissions and approximately 1.1 million people have cancer risks greater than 1-in-1 million due to PEPO facility-wide emissions (see table 2 of this preamble). The overall cancer incidence for this exposed population (*i.e.*, people with risks greater than or equal to 1-in-1 million and living within 10 km of PEPO production facilities) is 0.4, with 34 percent of the incidence due to emissions from PEPO production processes, 30 percent from emissions of non-PEPO processes at PEPO production facilities (that is, a total of 64 percent from emissions from PEPO production facilities) and 36 percent from emissions from other nearby stationary sources that are not PEPO production facilities.

After the controls proposed in this action are implemented for the PEPO Production source category (see section IV.B.2 of this preamble), the community-level maximum individual cancer risk will be reduced to the same as the facility-wide assessment, 300-in-1 million. The assessment estimated that 51 percent of the MIR is attributable to emissions from non-PEPO processes at a PEPO production facility, 43 percent from PEPO processes and 6 percent from other nearby stationary point sources that are not PEPO production facilities. The population

(within 10 km of PEPO facilities) exposed to cancer risks greater than 100-in-1 million from all nearby emissions will be significantly reduced from 5,300 people to 500 people; a 91 percent reduction from the baseline. The populations exposed to cancer risks greater than 100-in-1 million from the PEPO Production source category and facility-wide emissions are similarly reduced, from 3,300 people to 0 for source category emissions and from 4,000 to 200 for facility-wide emissions (see table 2 of this preamble). Furthermore, the overall cancer incidence for this exposed population is expected to be reduced from 0.02 to 0.001. The percentage of cancer incidence due to emissions from PEPO processes is reduced from 84 percent to 28 percent. The percentage of the cancer incidence due to emissions from non-PEPO processes at PEPO production facilities and emissions from other nearby stationary sources proportionately shifts to 46 percent and 26 percent respectively. EtO emissions across these sources remain the largest source of incidence, accounting for 93 percent of the overall cancer incidence for this exposed population.

The post-control population exposed to cancer risks greater than or equal to 1-in-1 million will be reduced from 1.2 million to 1.1 million. In comparison, after the controls proposed in this action, the number of people with risks greater than or equal to 1-in-1 million due to source category emissions would reduce from 830,000 to 560,000 and due to facility-wide emissions from 1.1 million to 1 million (see table 2 of this preamble). The overall cancer incidence for this exposed population is expected to be reduced from 0.4 to 0.3. The percentage of cancer incidence from PEPO processes is expected to decrease from 34 to 11 percent. The cancer incidence from non-PEPO processes at PEPO production facilities and from other nearby stationary sources are expected to proportionately shift to 40 percent and 49 percent, respectively.

More results from the community-based assessment are provided in the document titled *Analysis of Demographic Factors For Populations Living Near Polyether Polyols (PEPO)*

Production Facilities – Community-Based Assessment, which is available in the docket for this rulemaking.

Table 2. Inhalation Cancer Risk Assessment Results for Communities Living Within 10 km of PEPO Production Facilities

Risk Assessment	Maximum Individual Cancer Risk (-in-1 million)	Estimated Population at Increased Risk of Cancer	
		> 100-in-1 million	≥ 1-in-1 million
Baseline (Pre-control)			
PEPO Production Source Category	1,000	3,300	830,000
Facility-wide	2,000	4,000	1.1 million
Community-based	2,000	5,300	1.2 million
After Implementation of Proposed Controls (Post-control)			
PEPO Production Source Category	100	0	560,000
Facility-wide	300	200	1 million
Community-based	300	500	1.1 million

7. What demographic groups might benefit from this regulation?

To examine the potential for EJ concerns, the EPA conducted three different demographic analyses: a proximity analysis, baseline cancer risk-based analysis (*i.e.*, before implementation of any controls required by this proposed action), and post-control cancer risk-based analysis (*i.e.*, after implementation of the controls required by this proposed action). The proximity demographic analysis is an assessment of individual demographic groups in the total population living within 10 km (~6.2 miles) and 50 km (~31 miles) of the facilities. The baseline risk-based demographic analysis is an assessment of risks to individual demographic groups in the population living within 10 km and 50 km of the facilities prior to the implementation of any controls required by this proposed action ("baseline"). The post-control risk-based demographic analysis is an assessment of risks to individual demographic groups in the population living within 10 km and 50 km of the facilities after implementation of the controls required by this proposed action ("post-control"). Each of these demographic analyses were performed for the following three different HAP emissions scenarios: PEPO category HAP emissions (10 km and 50 km), whole-facility HAP emissions (10 km and 50 km), and community HAP emissions (10 km only). Demographic groups included in the analyses are: White, Black, American Indian and

Alaskan Native, 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 over 25 without a high school diploma, people living below the poverty level, people living below two times the poverty level, and linguistically isolated people. For a detailed discussion of the types of EJ analyses performed for this proposal and their results see section V.F of this preamble, "*What analysis of environmental justice did we conduct?*"

B. What are our proposed decisions regarding risk acceptability, ample margin of safety, and adverse environmental effect?

1. Risk Acceptability Under the Current MACT Standards

As noted in section III.A of this preamble, we weigh a wide range of health risk measures and factors in our risk acceptability determination, including the cancer MIR, the number of persons in various cancer and noncancer risk ranges, cancer incidence, the maximum noncancer TOSHI, the maximum acute noncancer HQ, the extent of noncancer risks, the distribution of cancer and noncancer risks in the exposed population, and risk estimation uncertainties (54 FR 38044, September 14, 1989).

Under the current MACT standards for the PEPO Production source category, the risk results indicate that the MIR is 1,000-in-1 million, driven by emissions of EtO, and well above 100-in-1 million, which is the presumptive limit of acceptability. The estimated incidence of cancer due to inhalation exposures is 0.3 excess cancer case per year. The population estimated to be exposed to cancer risks greater than 100-in-1 million is approximately 3,300, and the population estimated to be exposed to cancer risks greater than or equal to 1-in-1 million is approximately 3.8 million. The estimated maximum chronic noncancer TOSHI from inhalation exposure for this source category is 0.1 (for respiratory effects). The acute risk screening assessment of reasonable worst-case inhalation impacts indicates a maximum acute noncancer HQ of 1.

Considering all of the health risk information and factors discussed above, particularly the high MIR for the PEPO Production source category, the EPA proposes that the risks for the source category are unacceptable. As noted in section II.A of this preamble, when risks are unacceptable, under the 1989 Benzene NESHAP approach and CAA section 112(f)(2)(A), the EPA must first determine the emissions standards necessary to reduce risk to an acceptable level, and then determine whether further HAP emissions reductions are 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. Therefore, pursuant to CAA section 112(f)(2), we are proposing certain standards for emission sources of EtO in the PEPO Production source category that are more protective than the current PEPO NESHAP MACT standards.

2. Proposed Controls to Address Unacceptable Risks

As previously discussed, we conducted a risk assessment of the PEPO Production source category because the 2016 revision to the EPA's IRIS inhalation URE for EtO showed that EtO is more toxic than previously known.

For the PEPO Production source category, we identified EtO as the cancer risk driver from PEPO sources. We are aware of 20 PEPO facilities reporting EtO emissions in their emissions inventories from PEPO production processes. From our residual risk assessment, six facilities with emissions of EtO from process vents, storage vessels, equipment leaks, and wastewater have estimated cancer risks greater than 100-in-1 million in nearby communities. Additionally, an allowable leak of EtO from a heat exchange system contributes to cancer risks greater than 100-in-1 million. Thus, to reduce emissions of EtO from PEPO processes, the EPA is proposing more stringent control requirements for process vents, storage vessels, equipment leaks, heat exchange systems, and wastewater that emit or have the potential to emit EtO. As discussed later in this preamble, we are proposing that these requirements will reduce risk to an

acceptable level and provide an ample margin of safety to protect public health, and no additional requirements are needed to prevent an adverse environmental effect.

We discuss the control options we evaluated for reducing EtO emissions from PEPO processes in sections IV.B.2.a through IV.B.2.e of this preamble.

a. Process Vents and Storage Vessels

Process vents that emit EtO are primarily associated with reactors (from batch unit operations and continuous unit operations) that produce PEPO products using epoxides as a reactant. Other unit operations within the PMPU may also have process vents that emit EtO, such as process vents on condensers and distillation units.

The PEPO NESHAP (40 CFR 63.1425) specifies control requirements for process vents, based on the PEPO polymerization process (*i.e.*, polymerization using epoxides versus using THF). For PEPO processes that use epoxides as the reactant, the PEPO NESHAP specifies emissions limits for: (1) epoxide emissions, (2) nonepoxide organic HAP emissions from processes that use nonepoxide HAP to make or modify the product, and (3) nonepoxide organic HAP emissions from catalyst extraction. For the epoxide standards, the PEPO NESHAP (40 CFR 63.1425(b)) requires owners or operators to either: (1) reduce emissions at existing sources by 98 percent and new sources by 99.9 percent; (2) control emissions using a flare (existing sources only); (3) achieve an outlet concentration of 20 parts per million by volume (ppmv) or less; or (4) limit emissions to 1.69×10^{-2} kilogram of epoxide per megagram of product at existing sources and 4.43×10^{-3} kilogram of epoxide per megagram of product at new sources. We provide more details about process vents in our technology review discussion (see section IV.C.3 of this preamble) including specifics about the process vent standards for nonepoxide organic HAP emissions from processes that use nonepoxide HAP to make or modify the product, and for nonepoxide organic HAP emissions from catalyst extraction.

PEPO facilities use storage vessels to hold liquid and gaseous feedstocks for use in a process, as well as to store liquid and gaseous products from a process. Facilities typically store

EtO under pressure as a liquified gas, but EtO may also be found in small amounts in atmospheric storage vessels storing liquid products that use EtO as a reactant in their production. Typical emissions from atmospheric storage tanks occur from working and breathing losses, while pressure vessels are considered closed systems and, if properly maintained and operated, should have virtually no emissions. In some instances, there may be low levels of fugitive emissions from pressure vessels, and pressure vessels storing liquefied gases may be vented periodically to purge inerts.

The PEPO NESHAP (40 CFR 63.1432) cites the control provisions specified in the HON (40 CFR 63.119 through 63.123) which require owners or operators determine Group 1 or Group 2 designations of affected storage vessels, based on the volume of the storage vessel and maximum true vapor pressure (MTVP) of the material stored. Group 1 storage vessels are those with capacities between 75 m^3 (inclusive) and 151 m^3 and a MTVP greater than or equal to 13.1 kilopascals (kPa), and those with capacities greater than or equal to 151 m^3 and a MTVP greater than or equal to 5.2 kPa. The HON storage vessel standards that PEPO affected sources are currently subject to[30] require Group 1 storage vessels to reduce total HAP emissions by 95 percent (or 90 percent if the storage vessel was installed on or before December 31, 1992) by venting emissions through a closed vent system to any combination of control devices or to vent emissions through a closed vent system to a flare. Owners and operators of Group 1 storage vessels storing a liquid with a MTVP of total organic HAP less than 76.6 kPa are also allowed to reduce organic HAP by utilizing an internal floating roof (IFR), an external floating roof (EFR), an EFR converted to an IFR, vapor balancing, or by routing the emissions to a process or a fuel gas system. For Group 1 storage vessels storing a liquid with a MTVP of total organic HAP greater than or equal to 76.6 kPa, owners and operators can reduce organic HAP emissions by 95

[30] The HON requirements that were added in 2024 (89 FR 42932, May 16, 2024) apply to only the SOCMI source category; therefore, those 2024 HON amendments are currently not applicable to the PEPO Production source category. In other words, when we discuss the current PEPO NESHAP requirements that refer to HON, we mean pre-2024 HON requirements.

percent by venting emissions through a closed vent system to any combination of control devices, controlling emissions by routing them to a process or a fuel gas system, or by using vapor balancing. Pressure vessels (operating in excess of 204.9 kPa without emissions to the atmosphere) may also store materials with EtO. For storage vessels, the PEPO NESHAP, by reference to the HON, allows use of a design evaluation instead of a performance test to determine the percent reduction of control devices for any quantity of total uncontrolled organic HAP emissions being sent to the control device. We provide more details about storage vessels in our technology review discussion (see section IV.C.2 of this preamble).

Based on results from the risk assessment, we determined that the current MACT standards for PEPO process vents and storage vessels do not result in sufficient control of EtO emissions to prevent unacceptable risk. For example, emissions of EtO from PEPO process vents and storage vessels contribute to 72 percent of one facility's maximum individual cancer risk of 500-in-1 million. Therefore, we evaluated available control technologies with a higher level of control, as discussed below.

To lower the risk for PEPO facilities with EtO emissions, we analyzed a control option for process vents and storage vessels that are in EtO service which requires all process vents and storage vessels in EtO service to be controlled. This control option is based on requirements that were recently finalized in the MON and HON because of unacceptable risk (see 85 FR 49084, August 12, 2020, and 89 FR 42932, May 16, 2024, respectively). The definitions of process vents and storage vessels "in ethylene oxide service" from the MON and HON are presented here:

- For process vents, "in ethylene oxide service" means, when uncontrolled, each process vent contains a concentration of greater than or equal to 1 ppmv undiluted EtO, and when combined, the sum of all process vents within the process would emit uncontrolled EtO emissions greater than or equal to 5 lb/yr.

- For storage vessels of any capacity and vapor pressure, “in ethylene oxide service” means that the concentration of EtO within the tank liquid is greater than or equal to 0.1 percent by weight.

The MON and HON standards for process vents and storage vessels in EtO service, require owners and operators to route emissions through a closed vent system to a: (1) control device that reduces EtO by at least 99.9 percent by weight or to a concentration less than 1 ppmv for each process vent and storage vessel vent (or, for multiple process vents within a process, to less than 5 lb/yr for all combined process vents), or (2) flare meeting certain flare operating and monitoring requirements.

To ensure emissions from PEPO affected sources are controlled to an acceptable level of risk under the PEPO NESHAP, we are proposing to incorporate the same EtO emissions standards for process vents and storage vessels from the MON and HON into the PEPO NESHAP. Specifically, we are proposing at 40 CFR 63.1423(b) to refer to subpart F of the HON which defines the term “in ethylene oxide service” for process vents to mean each process vent in a process that, when uncontrolled, contains a concentration of greater than or equal to 1 ppmv undiluted EtO, and when combined, the sum of all these process vents within the process would emit uncontrolled EtO emissions greater than or equal to 5 pounds per year (lb/yr) (2.27 kilograms per year, kg/yr). We are also proposing to update the definition of “process vent” at 40 CFR 63.1423(b) to align with this proposed change. We are also proposing in the PEPO NESHAP at 40 CFR 63.1423(b) to refer to subpart F of the HON which defines the term “in ethylene oxide service” for storage vessels to mean that the concentration of EtO of the stored liquid is at least 0.1 percent by weight. We are also proposing that the exemption for “vessels and equipment storing and/or handling material that contains no organic HAP, or organic HAP as impurities only” listed in the definition of “storage vessel” at 40 CFR 63.1423(b) does not apply for storage vessels in EtO service. We are proposing procedures for determining whether process vents and/or storage vessels are in EtO service within the proposed definition of the term

"in ethylene oxide service" (by reference to 40 CFR 63.109 for PEPO process vents and storage vessels in EtO service). We are proposing at 40 CFR 63.1425(g) that PEPO process vents in EtO service either reduce emissions of EtO by: (1) venting emissions through a closed vent system to a non-flare control device that reduces EtO by at least 99.9 percent by weight, or to a concentration less than 1 ppmv for each process vent, or to less than 5 lb/yr for all combined process vents within the process; or (2) routing emissions through a closed vent system to a flare meeting the proposed flare operating requirements discussed in section IV.D.1 of this preamble (see proposed 40 CFR 63.1436). We are proposing at 40 CFR 63.1432(a) by reference to the HON (40 CFR 63.119(a)(5)) that PEPO storage vessels in EtO service either reduce emissions of EtO by: (1) venting emissions through a closed vent system to a non-flare control device that reduces EtO by at least 99.9 percent by weight or to a concentration less than 1 ppmv for each storage tank vent; or (2) venting emissions through a closed vent system to a flare meeting the proposed flare operating requirements discussed in section IV.D.1 of this preamble (see proposed 40 CFR 63.1436). We are proposing procedures to determine compliance with these proposed EtO standards at 40 CFR 63.1426(g) (by reference to 40 CFR 63.124 for PEPO process vents in EtO service) and 40 CFR 63.1432(v) (by reference to 40 CFR 63.124 for PEPO storage vessels in EtO service). In section IV.D.1 of this preamble, we recognized flares cannot achieve 99.9 percent EtO reduction. We also noted that as part of the CAA section 114 request, five facilities measured EtO emissions from their EtO emission points and only one of these five facilities currently use a flare to control EtO emissions from process vents or storage vessels. Even so, our modeling file does include several other PEPO facilities that do use flares to control process vents and storage vessels that emit EtO. Therefore, we accounted for these flares operating at 98 percent EtO reduction in our risk assessment and determined that it is not necessary for flares to achieve 99.9 percent EtO reduction to reduce risk to an acceptable level and provide an ample margin of safety to protect public health (provided that owners and operators still comply with the entire suite of EtO control requirements that we are proposing in this action).

Additionally, we propose removing the option to allow use of a design evaluation in lieu of performance testing to demonstrate compliance for storage vessels in EtO service to ensure that the required level of control is achieved (see proposed 40 CFR 63.1432(v) by reference to the HON (40 CFR 63.124(a)(2)(i) and (b)(3))). We are also proposing that after promulgation of the rule, owners or operators that choose to control emissions with a non-flare control device conduct an initial performance test according to proposed 40 CFR 63.1426(g) and 63.1432(v) by reference to the HON (40 CFR 63.124) on each existing control device in EtO service and on each newly installed control device in EtO service to verify performance at the required level of control. We are also proposing at 40 CFR 63.1426(g) and 63.1432(v) by reference to the HON (40 CFR 63.124(b)) that owners or operators conduct periodic performance testing on non-flare control devices in EtO service every 5 years.

Finally, we are proposing at 40 CFR 63.1427(a) that owners and operators may not use the extended cookout (ECO) pollution prevention technique to show compliance with the proposed standard for PEPO process vents in EtO service. The PEPO NESHAP at 40 CFR 63.1427(a) allows the use of ECO as a means of reducing epoxide emissions by the required percentage (98 or 99.9 percent) or complying with the production-based limit ($\leq 1.69 \times 10^{-2}$ or 4.43×10^{-3} kilograms of epoxide emissions per megagram of product made). This pollution prevention technique reduces emissions by extending the time of reaction, thus leaving less unreacted epoxides to be emitted downstream. To demonstrate a percent efficiency, it is necessary to designate the basis, or the "uncontrolled" emissions, for assessing the percent reduction. The point where uncontrolled emissions are to be assessed, called the "onset" of the ECO, is defined in the PEPO NESHAP at 40 CFR 63.1427(c) as the point when the epoxide concentration in the reactor liquid is equal to 25 percent of the concentration of epoxide in the liquid at the end of the epoxide feed. Procedures to calculate epoxide emissions at the end of ECO are provided in 40 CFR 63.1427(d). The EPA determined the default onset of ECO based on CBI from the Society of the Plastics Industry, which indicated the economic breakpoint for

when a cookout is no longer economically advantageous (see 62 FR 46804, September 4, 1997). However, new economic conditions suggest the ECO compliance option may no longer be viable. For instance, one facility reported, in response to the EPA's CAA section 114 request, that their customers require less than 1 ppm residual EtO, *i.e.*, it is economically advantageous to continue the reaction until 1 ppm is reached. It is impractical to achieve a 99.9 percent reduction from an onset of 1 ppm. Additionally, using the current definition of onset, ECO could lead to high EtO emissions relative to the starting amount of epoxide used. Therefore, we believe it is not appropriate to continue allowing the ECO pollution prevention technique to demonstrate compliance with the proposed EtO emissions standards (*i.e.*, reduce EtO by at least 99.9 percent by weight) that are intended to control emissions from process vents and storage vessels to an acceptable risk level. We are also proposing that it is not appropriate to continue to allow the existing production-based limits (*i.e.*, $\leq 1.69\text{x}10^{-2}$ or $4.43\text{x}10^{-3}$ kilograms of epoxide emissions per megagram of product made) in place of the new EtO emissions standards. The $1.69\text{x}10^{-2}$ production-based limit is an alternative to the 98 percent emission reduction standard for existing affected sources which is not as stringent as the proposed 99.9 percent emission reduction standard for EtO. While the $4.43\text{x}10^{-3}$ production-based limit is an alternative to the 99.9 percent emission reduction standard for new affected sources, it is related to the aggregate reduction of total epoxide emissions and not specifically to EtO emissions. Additionally, it is not clear how these production-based limits (also referred to "as emission factors") were derived[31] and we do not have enough information to set a new production-based limit that would be equivalent to the proposed EtO emissions standards.

See the document titled *Analysis of Control Options for Process Vents and Storage Vessels to Reduce Residual Risk of Ethylene Oxide in the PEPO Production Source Category*,

[31] Although the original proposal for the PEPO NESHAP (62 FR 46804, September 4, 1997) mentions that the method for determining these emission factors is detailed in the Supplementary Information Document, we could not locate this derivation in the document titled *Hazardous Air Pollutant Emissions from the Production of Polyether Polyols—Supplementary Information Document for Proposed Standards*.

which is available in the docket for this action, for more information on the control option the EPA evaluated to reduce EtO risk from PEPO process vents and storage vessels.

b. Equipment Leaks

Emissions of EtO from equipment leaks occur in the form of gases or liquids that escape to the atmosphere through connection points (*e.g.*, threaded fittings) or through the moving parts of valves, pumps, compressors, PRDs, and certain types of process equipment. The PEPO NESHAP defines equipment leaks as “emissions of organic HAP from a connector, pump, compressor, agitator, pressure relief device, sampling connection system, open-ended valve or line, valve, surge control vessel, bottoms receiver, or instrumentation system in organic HAP service.” The equipment leak requirements apply to equipment that contain or contact material that are 5 percent by weight or more of organic HAP, operate 300 hours per year or more, and are not in vacuum service.

The PEPO NESHAP requirements for equipment leaks directly reference the provisions in 40 CFR part 63, subpart H (which is part of the HON). The HON equipment leak requirements vary by equipment component type, but require LDAR using monitoring with EPA Method 21 of appendix A-7 to 40 CFR part 60 at certain frequencies (*e.g.*, monthly, quarterly, every 2 quarters, annually) and varying leak definitions (*e.g.*, 500 ppmv; 1,000 ppmv; 10,000 ppmv) depending on the type of service (*e.g.*, gas and vapor service or in light liquid service). The LDAR requirements for components in heavy liquid service include sensory monitoring and the use of EPA Method 21 monitoring if a leak is identified. We provide more details about equipment leaks in our technology review discussion (see section IV.C.5 of this preamble).

Results from our risk assessment indicate that, for the source category MIR of 1,000-in-1 million, more than 20 percent is from emissions of EtO related to PEPO equipment leaks. We also note that the risk from EtO from PEPO equipment leaks at three facilities (including the facility driving the MIR) is ≥ 100-in-1 million. To help reduce the risk associated with EtO emissions from equipment leaks in the PEPO Production source category, we performed a

review of available measures for reducing EtO emissions from components that are most likely to be in EtO service, which include connectors (in gas and vapor service or light liquid service), pumps (in light liquid service), and valves (in gas or light liquid service). We identified options for further strengthening LDAR practices to find and repair equipment leaks from these three pieces of equipment more quickly, including lowering the leak definitions and/or requiring more frequent monitoring with EPA Method 21 of appendix A-7 to 40 CFR part 60, which align with the recently finalized EtO standards for equipment leaks in the HON (89 FR 42932, May 16, 2024).

For gas/vapor and light liquid connectors in EtO service, we identified two options: (1) require connector monitoring at a leak definition of 500 ppmv with annual monitoring and no reduction in monitoring frequency (*i.e.*, no skip periods), and (2) require connector monitoring at a leak definition of 100 ppmv with annual monitoring and no reduction in monitoring frequency.

For light liquid pumps in EtO service, we identified three options: (1) lower the leak definition from 1,000 ppmv to 500 ppmv with monthly monitoring, (2) lower the leak definition from 1,000 ppmv to 100 ppmv with monthly monitoring, or (3) require the use of leakless pumps (*i.e.*, canned pumps, magnetic drive pumps, diaphragm pumps, pumps with tandem mechanical seals, pumps with double mechanical seals) with annual monitoring and a leak defined as any reading above background concentration levels.

For gas/vapor and light liquid valves in EtO service, we identified two options: (1) require a leak definition of 500 ppmv with monthly monitoring and no reduction in monitoring frequency, and (2) lower the leak definition from 500 ppmv to 100 ppmv with monthly monitoring and no reduction in monitoring frequency.

Due to the high residual risk for some of the facilities from equipment leaks of EtO and the potential need for greater emission reduction to meet an acceptable level of risk for the PEPO Production source category, we also evaluated a more stringent combined option which requires monthly monitoring for valves (in gas/vapor and light liquid service), connectors (in gas/vapor

and light liquid service), and pumps (light liquid service) in EtO service at a leak definition of 100 ppmv for valves and connectors and 500 ppmv for light liquid pumps using EPA Method 21 of appendix A-7 to 40 CFR part 60. This combined option also does not allow equipment in EtO service to be monitored less frequently with skip periods, nor does the option allow facilities to take advantage of the delay of repair provisions. We analyzed increasing the monitoring frequency to monthly for connectors because they are the most numerous equipment components at chemical facilities, and they are the most significant contribution to the baseline emissions from leaking equipment at the EtO-emitting facilities.

For the component-specific control options, we calculated the EtO baseline emissions and emissions after implementation of controls for each facility using average volatile organic compound (VOC) emission rates for each component, and the component counts and the EtO weight percent of the process from the responses to the EPA's CAA section 114 request. For the combined option of monthly monitoring of gas and light liquid valves and connectors at 100 ppmv and light liquid pumps at 500 ppmv, we do not have emission factors to estimate reductions for increased monitoring frequencies for connectors. Where a simplified emission factor method for determining the potential reductions of applying the option did not exist, we estimated emissions reductions based on the approach used in other rules,[32] where detailed leak data or an assumed leak distribution were available. The equipment leaks model uses a Monte Carlo analysis to estimate emissions from EtO facility equipment leaks. The memorandum *Analysis of Control Options for Equipment Leaks to Reduce Residual Risk of Ethylene Oxide in the PEPO Production Source Category*, which is available in the docket for this action, provides a detailed discussion of the model.

In this action, we are also proposing the same definition for the term "in ethylene oxide service" for equipment as used in the final amendments to the HON (89 FR 42932, May 16,

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[32] *Gas Plant Equipment Leak Monte Carlo Model Code and Instructions*. October 21, 2021. EPA Docket No. EPA-HQ-OAR-2021-0317. *Control Options for Equipment Leaks at Gasoline Distribution Facilities.* October 20, 2021. EPA Docket No. EPA-HQ-OAR-2020-0371.

2024).[33] For equipment leaks, we are proposing to define "in ethylene oxide service" in the PEPO NESHAP at 40 CFR 63.1423(b) (by reference to 40 CFR 63.101) to mean any equipment that contains or contacts a fluid (liquid or gas) that is at least 0.1 percent by weight of EtO. We are proposing procedures for determining whether equipment is in EtO service within the proposed definition of the term "in ethylene oxide service" (by reference to 40 CFR 63.109 for PEPO equipment in EtO service). We are proposing that any piece of equipment that is in ethylene oxide service is also in organic HAP service. For PEPO equipment in EtO service, to achieve greater emissions reductions to help meet an acceptable level of risk for the PEPO Production source category, we are proposing the following combined requirements: monitoring of connectors in gas/vapor and light liquid service at a leak definition of 100 ppmv on a monthly basis with no reduction in monitoring frequency or delay of repair; monthly monitoring of light liquid pumps at a leak definition of 500 ppmv; and monthly monitoring of gas/vapor and light liquid valves at a leak definition of 100 ppmv with no reduction in monitoring frequency or delay of repair (see proposed 40 CFR 63.1434(a) by reference to the HON). The document titled *Analysis of Control Options for Equipment Leaks to Reduce Residual Risk of Ethylene Oxide in the PEPO Production Source Category*, which is available in the docket for this action, provides additional information on all evaluated control options to reduce EtO risk from PEPO equipment leaks.

c. Heat Exchange Systems

Emissions of EtO from heat exchange systems occur due to corrosion or cracks in internal tubing materials, which allows some process fluids to mix or become entrained with the cooling water. Pollutants (*e.g.*, EtO) in the process fluids may subsequently be released from the cooling water into the atmosphere when the water is exposed to air (*e.g.*, in a cooling tower for closed-loop systems or trenches/ponds in a once-through system). The HON heat exchange system standards that PEPO affected sources are currently subject to require owners or operators

[33] See 40 CFR 63.101.

to monitor heat exchange systems for leaks of process fluids into cooling water and take actions to repair leaks within 45 days if they are detected (facilities may delay the repair of leaks if they meet certain criteria). To comply with the provisions, owners or operators can use any method listed in 40 CFR part 136 to sample cooling water for leaks for the HAP listed in table 4 to subpart F (recirculating systems) and table 9 to subpart G (once-through systems) (and other representative substances such as total organic compounds (TOC) or VOC that can indicate the presence of a leak can also be used). In addition, owners or operators can monitor for leaks using a surrogate indicator (*e.g.*, ion specific electrode monitoring, pH, conductivity), provided that they meet certain criteria in 40 CFR 63.104(c). We provide more details about heat exchange systems in our technology review discussion (see section IV.C.1 of this preamble).

For heat exchange systems, we found that, while we did not identify a report of EtO emissions from a PEPO heat exchange system leak, a model using representative leaks (and the current standards for monitoring and repair) indicated that a potential leak currently allowed by the PEPO NESHAP containing EtO from a facility's cooling tower could significantly contribute to unacceptable risk. Thus, we are proposing to use the same definition of the term "in ethylene oxide service" as used in the final amendments to the HON (89 FR 42932, May 16, 2024). We are proposing in the PEPO NESHAP at 40 CFR 63.1423 to refer to subpart F of the HON which defines the term "in ethylene oxide service" for heat exchange systems to mean any heat exchange system in a process that cools process fluids (liquid or gas) that are 0.1 percent or greater by weight of EtO. We are proposing procedures for determining whether heat exchange systems are in EtO service within the proposed definition of the term "in ethylene oxide service" (by reference to 40 CFR 63.109 for PEPO heat exchange systems in EtO service). We are proposing that any heat exchange system that is in ethylene oxide service is also in organic HAP service. To address risk from EtO allowable emissions due to PEPO heat exchange system leaks, we evaluated the following option for PEPO heat exchange systems "in ethylene oxide service" which: (1) requires use of the Modified El Paso Method (see section IV.C.1 of this preamble),

(2) requires quarterly monitoring using the Modified El Paso Method, (3) reduces the allowed amount of repair time from 45 days after finding a leak to 15 days from the sampling date, and (4) prohibits delay of repair. We also evaluated this same option except with varying monitoring frequencies (*i.e.*, monthly and weekly) instead of quarterly. Using equation 7-2 from appendix P of the Texas Commission on Environmental Quality's (TCEQ) Sampling Procedures Manual,[34] model leak distributions and concentrations, and other model input parameters, we anticipate the quarterly option would reduce EtO emissions from leaking PEPO heat exchange systems by 54 percent because owners or operators would identify and repair leaks more quickly, which is needed to help reduce potential unacceptable risk from the PEPO Production source category. See section IV.B.4 of this preamble for an analysis of the monthly and weekly options to provide an ample margin of safety. We are proposing weekly monitoring at 40 CFR 63.1435(a) by reference to the HON (40 CFR 63.104(g)(6)) based on that ample margin of safety analysis. The document titled *Analysis of Control Options for Heat Exchange Systems to Reduce Residual Risk of Ethylene Oxide in the PEPO Production Source Category*, which is available in the docket for this action, provides additional information on this evaluated control option to reduce EtO risk from PEPO heat exchange systems.

d. Wastewater

EtO is emitted from wastewater collection, storage, and treatment systems that are uncovered or open to the atmosphere through volatilization of the compound at the liquid surface. Emissions occur by diffusive or convective means, or both. Diffusion occurs when organic pollutant concentrations at the water surface are much higher than ambient concentrations. The organic pollutants volatilize, or diffuse into the air, to reach equilibrium between the aqueous and vapor phases. Convection occurs when air flows over the water surface,

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[34] See appendix B in the document titled: *The Air Stripping Method (Modified El Paso Method) for Determination of Volatile Organic Compound (VOC) Emissions from Water Sources*, which is included in the docket for this rulemaking.

sweeping organic vapors from the water surface into the air. The rate of volatilization is related directly to the speed of the air flow over the water surface.

The HON wastewater standards that PEPO affected sources are currently subject to (40 CFR 63.1433 cites the control provisions specified in the HON at 40 CFR 63.132 through 63.147) divide wastewater streams into Group 1 wastewater streams, which require controls, and Group 2 wastewater streams, which generally do not require controls provided they do not exceed Group 1 thresholds. The Group 1 and Group 2 designations for wastewater streams are based on volumetric flow rate and total annual average organic HAP concentration. The HON specifies performance standards for treating Group 1 wastewater streams using open or closed biological treatment systems or using a design steam stripper with vent control. For APCDs (*e.g.*, thermal oxidizers) used to control emissions from collection system components, steam strippers, or closed biological treatment, the HON provides owners or operators several compliance options including achieving a 95-percent destruction efficiency, achieving a 20-ppmv outlet concentration, or implementing design specifications for temperature and residence time. We provide more details about wastewater streams in our technology review discussion (see section IV.C.4 of this preamble).

The results from our risk assessment show that EtO emissions from wastewater contribute 77 percent of the source category MIR (the MIR is 1,000-in-1-million), thus wastewater is one of the EtO emission sources contributing to the EPA's finding of unacceptable risk for the PEPO Production source category. To lower the risk for the PEPO facilities with EtO emissions, we are proposing at 40 CFR 63.1423(b) to use the same definition of the term "in ethylene oxide service" for wastewater as used in the recently amended HON (89 FR 42932, May 16, 2024) which means any wastewater stream that contains total annual average concentration of EtO greater than or equal to 1 part per million by weight (ppmw) at any flow rate. We are proposing procedures for determining whether a wastewater stream is in EtO service within the proposed definition of the term "in ethylene oxide service" (by reference to 40 CFR

63.109 for PEPO wastewater streams in EtO service). We are also proposing, by reference to the amended HON, that a wastewater stream in EtO service would be considered a Group 1 wastewater stream (see 40 CFR 63.1433(a)(23) and (27) and 63.132(c)(1)(iii) and (d)(1)(ii)). In addition, we are proposing to update the definition of "wastewater" at 40 CFR 63.1423(b) to align with these proposed changes. As part of the management and treatment requirements for Group 1 wastewater streams, owners and operators would be required at 40 CFR 63.138(b)(3) and (c)(3) to reduce, by removal or destruction, the concentration of EtO to a level less than 1 ppmw. We anticipate that owners and operators will use stream stripping to comply with this proposed requirement. While we acknowledge EtO can be biodegraded, the compound is not on table 37 to subpart G of the HON, suggesting that it is not a readily biodegradable compound when using a biological treatment method, and EtO would need to be stripped out of the wastewater to meet the standard at 40 CFR 63.138(b)(3) and (c)(3). Therefore, we evaluated Control Option 1 using a steam stripper achieving a 98 percent reduction of EtO emissions (based on the fraction removed (Fr) value of EtO[35] in table 9 to subpart G of the HON).

Additionally, we are aware that some chemical manufacturing facilities dispose of certain wastewater streams that contain EtO by adding those wastewaters to the cooling water of their heat exchange systems, rather than considering those EtO-containing streams to be potential sources of wastewater. To help reduce risk from the PEPO Production source category by eliminating these types of EtO emissions from wastewater being injected into heat exchange systems, we are also proposing to prohibit owners and operators from injecting water into or disposing of water through any heat exchange system in a PMPU meeting the conditions of 40 CFR 63.1420 if the water contains any amount of EtO, has been in contact with any process stream containing EtO, or the water is considered wastewater as defined in 40 CFR 63.1423 (see 40 CFR 63.1435(i). The document titled *Analysis of Control Options for Wastewater Streams to*

[35] The Fr is the fraction of a HAP that is stripped from wastewater and is an indicator of the extent to which a HAP is effectively removed during the steam stripping process, which for EtO is 98 percent.

Reduce Residual Risk of Ethylene Oxide in the PEPO Production Source Category, which is available in the docket for this action, provides additional information on this evaluated control option to reduce EtO risk from PEPO wastewater streams.

e. Summary

For process vents, storage vessels, equipment leaks, heat exchange systems, and wastewater, we considered the control options described above for reducing EtO risk from the PEPO Production source category that are associated with processes subject to the PEPO NESHAP. To reduce risk from the source category to an acceptable level, we propose to require control of EtO emissions from: (1) process vents, (2) storage vessels, (3) equipment leaks, (4) heat exchange systems, and (5) wastewater in EtO service, as defined in this proposal. For process vents and storage vessels in EtO service, we are proposing owners and operators reduce emissions of EtO by either: (1) venting emissions through a closed vent system to a non-flare control device that reduces EtO by greater than or equal to 99.9 percent by weight or to a concentration less than 1 ppmv for each process vent and storage vessel, or (2) venting emissions through a closed vent system to a flare meeting the proposed operating and monitoring requirements for flares (see section IV.D.1 of this preamble). For process vents, we are also proposing an annual limit of 5 lb/yr or less for all combined process vents as an alternative to the percent control and concentration options. For equipment leaks in EtO service, we are proposing the following combined requirements: monitoring of connectors in gas/vapor and light liquid service at a leak definition of 100 ppmv on a monthly basis with no reduction in monitoring frequency and no delay of repair; monthly monitoring of light liquid pumps at a leak definition of 500 ppmv; and monthly monitoring of gas/vapor and light liquid valves at a leak definition of 100 ppmv with no reduction in monitoring frequency and no delay of repair. For heat exchange systems in EtO service, we are proposing to require owners or operators to conduct more frequent leak monitoring (weekly instead of quarterly) and to repair leaks within 15 days from the sampling date (in lieu of the current 45-day repair requirement after receiving results of

monitoring indicating a leak), and to not allow owners or operators to delay repairs. For wastewater in EtO service, we are proposing to revise the Group 1 wastewater stream threshold for sources to include wastewater streams in EtO service, and to prohibit owners and operators from injecting wastewater in EtO service into or disposing of water through any heat exchange system in a PMPU.

In all cases, we are proposing that, if information exists that suggests EtO could be present in these processes, then the emission source is considered to be in EtO service unless the owner or operator conducts the procedures specified in 40 CFR 63.109 to demonstrate that the emission source does not meet the definition of being in EtO service (see proposed definition of the term "in ethylene oxide service" at 40 CFR 63.1423(b) (by reference to 40 CFR 63.101) and proposed 40 CFR 63.1425(g) for process vents, 40 CFR 63.1432(v) for storage vessels, 40 CFR 63.1433(a)(27) for wastewater, 40 CFR 63.1434(a)(6) for equipment leaks, and 40 CFR 63.1435(j) for heat exchange systems). Examples of information that could suggest EtO is present in a process stream include calculations based on safety data sheets, material balances, process stoichiometry, or previous test results provided the results are still relevant to the current operating conditions.

Based on the proposed applicability thresholds, we expect that up to 21 PEPO facilities will be affected by one or more of the proposed EtO-specific standards; and we anticipate that all of these facilities will be subject to the process vent, storage vessel, equipment leak, heat exchange system, and wastewater EtO-specific provisions.

3. Determination of Risk Acceptability After Proposed Emission Reductions

As noted in sections II.A.1 and III.A of this preamble and in the 1989 Benzene NESHAP, the EPA sets standards under CAA section 112(f)(2) using a two-step approach, with an analytical first step to determine whether risks are acceptable. This determination "considers all health information, including risk estimation uncertainty, and includes a presumptive limit on maximum individual lifetime [cancer] risk (MIR) of approximately 1 in 10 thousand" (54 FR

38044, 38045/col. 1, September 14, 1989). In the 1989 Benzene NESHAP, the EPA explained that "[i]n establishing a presumption for MIR, rather than a rigid line for acceptability, the Agency intends to weigh it with a series of other health measures and factors" (*Id.*, at 38045/col. 3). "As risks increase above this benchmark, they become presumptively less acceptable under section 112, and would be weighed with the other health risk measures and information in making an overall judgement on acceptability" (*Id.*).

Table 3 of this preamble presents the levels of emissions control proposed to address unacceptable risks for the PEPO Production source category, which includes reducing emissions of EtO for PEPO processes and requiring more stringent controls for process vents, storage vessels, equipment leaks, heat exchange systems, and wastewater without considering costs.

Table 3. EtO Risk Control Options for the PEPO Production Source Category

Emission Source (in EtO service)	Description of Proposed Control Option	Percent Reduction of EtO Emissions
Process Vent	Route emissions through a closed vent system to a non-flare control device[1] that reduces EtO by greater than or equal to 99.9 percent by weight, to a concentration less than or equal to 1 ppmv for each process vent, or to less than 5 lb/yr for all combined process vents.	99.9 percent
Storage Vessel	Route emissions through a closed vent system to a non-flare control device[1] that reduces EtO by greater than or equal to 99.9 percent by weight or to a concentration less than or equal to 1 ppmv.	99.9 percent
Equipment Leaks	For equipment components that are in EtO service, monthly monitoring using EPA Method 21 of connectors in gas/vapor and light liquid service at a leak definition of 100 ppmv with no reduction in monitoring frequency and no repair delays; monthly monitoring of light liquid pumps at a leak definition of 500 ppmv; and monthly monitoring of gas/vapor and light liquid valves at a leak definition of 100 ppmv with no reduction in monitoring frequency and no delay of repair.	70 percent
Heat Exchange Systems	Quarterly[2] monitoring for leaks using the Modified El Paso Method and repair of leaks required no later than 15 days after the date sampling occurs.	54 percent
Wastewater	Control all wastewater with a total annual average concentration of EtO greater than or equal to 1 ppmw at any flow rate as if it were a Group 1 wastewater.	98 percent

[1] Owners or operators can also use a flare that meets the proposed requirements at 40 CFR 63.1436 discussed in section IV.D.1 of this preamble).
[2] Quarterly monitoring of heat exchange systems addresses the source category's unacceptable risk, but the EPA is proposing to require weekly monitoring to provide an ample margin of safety.

For the PEPO Production source category, after implementation of the proposed controls to address unacceptable risks, the MIR is reduced to 100-in-1 million (down from 1,000-in-1 million) with no facilities or populations exposed to risk levels greater than 100-in-1 million. The population exposed to risk levels greater than or equal to 1-in-1 million living within 50 km of affected facilities would be reduced from 3.8 million people to 1.7 million people. The total estimated cancer incidence for the source category of 0.3 (pre-control) is reduced to 0.08 (post-control) excess cancer cases per year. The maximum modeled chronic noncancer TOSHI for the source category remains unchanged. It is estimated to be 0.1 (for respiratory effects) with no populations estimated to be exposed to a TOSHI greater than 1. The estimated worst-case off-site acute exposures to emissions from the PEPO Production source category also remain unchanged, with a maximum modeled acute noncancer HQ of 1 based on the REL for methoxytriglycol (a glycol ether). Acute impacts are deemed negligible for HAP for which acute HQs are less than or equal to 1. Table 4 of this preamble summarizes the reduction in cancer risks associated with the source category based on the proposed controls. More detail is available in the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule*, which is available in the docket for this rulemaking.

Table 4. Cancer Risks After Implementation of Proposed Control for the PEPO Production Source Category

Control Scenario	MIR (x-in-1 million)	Population (≥1-in-1 million)	Population (>100-in-1 million)	Cancer Incidence
Pre-Control Baseline	1,000	3,800,000	3,300	0.3
Post-Control	100	1,700,000	0	0.08

As noted earlier in this section, the EPA considers an MIR of "approximately 1-in-10 thousand" (*i.e.*, 100-in-1 million) to be the presumptive limit of acceptability (54 FR 38045, September 14, 1989) and the proposed controls lower the MIR of the PEPO Production source category to 100-in-1 million. This is a significant reduction from the pre-control MIR of 1,000-

in-1 million. For noncancer effects, the EPA has not established under section 112 of the CAA a numerical range for risk acceptability as it has with carcinogens, nor has it determined that there is a bright line above which acceptability is denied. However, the Agency has established that, as exposure increases above a reference level (as indicated by a HQ or TOSHI greater than 1), confidence that the public will not experience adverse health effects decreases and the likelihood that an effect will occur increases.

Therefore, considering all health information, including risk estimation uncertainty, the EPA proposes that the resulting risks after implementation of the proposed controls for the PEPO Production source category detailed in section IV.B.2 would be acceptable. We solicit comments on all the proposed control requirements to reduce risk to an acceptable level for the PEPO Production source category.

4. Ample Margin of Safety Analysis

The second step in the residual risk decision framework is a determination of whether the emission standards proposed to achieve an acceptable risk level provide an ample margin of safety to protect public health, or whether more stringent emission standards would be required for this purpose. In making this determination, we considered the health risk and other health information considered in our acceptability determination, along with additional factors not considered in the risk acceptability step, including costs and economic impacts of controls, technological feasibility, uncertainties, and other relevant factors, consistent with the approach of the 1989 Benzene NESHAP. Table 5 of this preamble summarizes the costs and EtO emission reductions we estimated for the proposed control requirements to reduce the risks to an acceptable level for the PEPO Production source category. For details on the assumptions and methodologies used in the costs and impacts analyses, see the technical documents titled, *Analysis of Control Options for Process Vents and Storage Vessels to Reduce Residual Risk of Ethylene Oxide in the PEPO Production Source Category*; *Analysis of Control Options for Equipment Leaks to Reduce Residual Risk of Ethylene Oxide in the PEPO Production Source*

Category; *Analysis of Control Options for Heat Exchange Systems to Reduce Residual Risk of Ethylene Oxide in the PEPO Production Source Category*; and *Analysis of Control Options for Wastewater Streams to Reduce Residual Risk of Ethylene Oxide in the PEPO Production Source Category*, which are available in the docket for this rulemaking. We note that for three fugitive EtO emission sources (*i.e.*, equipment leaks, heat exchange systems, and wastewater), the emission reductions (and subsequent cost effectiveness values for EtO) differ from reductions expected to occur from reported emissions inventories due to use of model plants, engineering assumptions made to estimate baseline emissions, and uncertainties in how fugitive emissions may have been calculated for reported inventories compared to our model plants analyses (see the aforementioned technical documents).

Table 5. Nationwide EtO Emission Reductions and Cost Impacts for Control Options Considered for PEPO Processes

Control Option	Total Capital Investment (MM$)	Total Annualized Costs (MM$/yr)	EtO Emission Reductions (tpy)	Cost-Effectiveness ($/ton EtO)
A—Process Vent & Storage Vessel Controls	2.55	2.91	10.8	269,400
B—Equipment Leak Controls	0.06	1.23	20.3	60,600
C—Heat Exchange System Controls	0.21	0.36	12.1	29,800
D—Wastewater Controls	14.4	5.75	312	18,400
Total (A + B + C + D)	17.2	10.2	355	28,700

For the ample margin of safety analyses, we evaluated the cost and feasibility of available control technologies that could be applied to PEPO processes to reduce risks further, considering all of the health risks and other health information evaluated in the risk acceptability determination described above and the additional information that we can consider only in the ample margin of safety analysis (*i.e.*, costs and economic impacts of controls, technological feasibility, uncertainties, and other relevant factors). We note that the EPA previously determined that the standards for the PEPO Production source category provide an ample margin

of safety to protect public health (79 FR 17340, March 27, 2014), and that the most significant change since that determination was the revised 2016 IRIS inhalation URE for EtO. As such, we focused our ample margin of safety analysis on cancer risk for EtO since, even after application of controls needed to get risks to an acceptable level, EtO drives cancer risk and cancer incidence (*i.e.*, 98 percent of remaining cancer incidence of 0.08 is from EtO) for the PEPO Production source category.

For process vents, storage vessels, equipment leaks, and wastewater in the PEPO Production source category, we did not identify any other control options for EtO emissions beyond those proposed in this action to reduce risks to an acceptable level. Furthermore, the proposed EtO controls for process vents, storage vessels, equipment leaks, and wastewater to reduce risks to an acceptable level are far more stringent than other options we identified to control HAP generally (*i.e.*, see sections IV.D and IV.C of this preamble). Therefore, we conclude that these controls to reduce EtO emissions from PEPO processes to reduce risks to an acceptable level would also provide an ample margin of safety to protect public health.

For EtO emissions from leaks in heat exchangers, we found that weekly monitoring is a cost-effective option to provide an ample margin of safety. Considering the incremental cost effectiveness from quarterly to monthly ($197,200 per ton of EtO emissions reductions) and from monthly to weekly ($1,734,200 per ton of EtO emissions reductions) are within the range of accepted values of cost effectiveness for EtO reductions,[36] we find it appropriate to propose the weekly option (which is required by the HON) to provide an ample margin of safety. For this reason, we are proposing weekly monitoring for leaks for heat exchange systems in EtO service using the Modified El Paso Method (see 40 CFR 63.1435(a) by reference to the HON (40 CFR 63.104(g)(6)). If the owner or operator finds a leak, we are proposing to require repair of the leak to reduce the concentration or mass emissions rate below the applicable leak action level as soon as practicable, but no later than 15 days after collecting the sample with no delay of repair

[36] See 89 FR 24110, April 5, 2024.

allowed (see 40 CFR 63.1435(a) by reference to the HON (40 CFR 63.104(h)(6)). The document titled *Analysis of Control Options for Heat Exchange Systems to Reduce Residual Risk of Ethylene Oxide in the PEPO Production Source Category*, which is available in the docket for this action, provides additional information on this evaluated control option to reduce EtO risk from PEPO heat exchange systems. We solicit comments on the proposed control requirements to provide an ample margin of safety for the PEPO Production source category.

5. Adverse Environmental Effects

Based on our screening assessment of environmental risk presented in section IV.A.4 of this preamble, we did not identify any areas of concern with respect to environmental risk. Therefore, we have determined that HAP emissions from the PEPO Production source category do not result in an adverse environmental effect, and we are proposing that it is not necessary to set a more stringent standard to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect.

C. What are the results and proposed decisions based on our technology review?

In addition to the proposed EtO-specific requirements discussed in section IV.B.2 of this preamble, under CAA section 112(d)(6) we also evaluated developments in practices, processes, and control technologies for reducing HAP emissions from heat exchange systems, storage vessels, process vents, wastewater, and equipment leaks for processes subject to the PEPO NESHAP (see sections IV.C.1 through IV.C.5 of this preamble, respectively). We analyzed costs and emissions reductions for each emission source (*e.g.*, process vents) and determined cost effectiveness (annualized cost/Mg or ton of emissions reduction) on a HAP basis. We also evaluated fenceline monitoring as a development in practices considered under CAA section 112(d)(6) for the purposes of managing fugitive emissions from sources subject to the PEPO NESHAP (see section IV.C.6 of this preamble).

1. Standards for Heat Exchange Systems

Heat exchangers are devices or collections of devices used to transfer heat from process fluids to another process fluid (typically water) without intentional direct contact of the process fluid with the cooling fluid (*i.e.*, non-contact heat exchanger). There are two types of heat exchange systems: closed-loop recirculation systems and once-through systems. Closed-loop recirculation systems use a cooling tower to cool the heated water leaving the heat exchanger and then return the newly cooled water to the heat exchanger for reuse. Once-through systems typically use surface freshwater (*e.g.*, from a nearby river) as the influent cooling fluid to the heat exchangers, and the heated water leaving the system is then discharged from the facility. At times, the internal tubing material of a heat exchanger can corrode or crack, allowing some process fluids to mix or become entrained with the cooling water. Pollutants in the process fluids may subsequently be released from the cooling water into the atmosphere when the water is exposed to air (*e.g.*, in a cooling tower for closed-loop systems or trenches/ponds in a once-through system).

The PEPO NESHAP at 40 CFR 63.1423 currently refers to the HON (40 CFR 63.101) to define a heat exchange system as "a device or collection of devices used to transfer heat from process fluids to water without intentional direct contact of the process fluid with the water (*i.e.*, non-contact heat exchanger) and to transport and/or cool the water in a closed-loop recirculation system (cooling tower system) or a once-through system (*e.g.*, river or pond water)." We are proposing to delete the reference to the HON definition and instead define a heat exchange system in the PEPO NESHAP so it refers to a PMPU (see section IV.E.4 of this preamble). The definition also clarifies that: (1) for closed-loop recirculation systems, the heat exchange system consists of a cooling tower, all PMPU heat exchangers that are in organic HAP service serviced by that cooling tower, and all water lines to and from these process unit heat exchangers; (2) for once-through systems, the heat exchange system consists of all heat exchangers that are in organic HAP service, servicing an individual PMPU and all water lines to and from these heat exchangers; (3) sample coolers or pump seal coolers are not considered heat exchangers for the

purpose of this proposed definition and are not part of the heat exchange system; and (4) intentional direct contact with process fluids results in the formation of a wastewater. This definition also applies to heat exchange systems in EtO service as described in section IV.B.2.c of this preamble.

The PEPO NESHAP requirements for heat exchange systems at 40 CFR 63.1435, by reference to the HON (40 CFR 63.104), includes an LDAR program for owners or operators of certain heat exchange systems that do not meet one or more of the conditions in 40 CFR 63.104(a). The LDAR program specifies that owners or operators must monitor heat exchange systems for leaks of process fluids into cooling water and take actions to repair detected leaks within 45 days. Owners or operators may delay the repair of leaks if they meet the applicable criteria in 40 CFR 63.104. The PEPO NESHAP allows owners or operators to use any method listed in 40 CFR part 136 to sample cooling water for leaks for the HAP listed in table 4 to 40 CFR part 63, subpart F (for HON) that is also listed in table 4 to 40 CFR part 63, subpart PPP (recirculating systems) and table 9 to 40 CFR part 63, subpart G (for HON) that is also listed in table 4 to 40 CFR part 63, subpart PPP (once-through systems) (and other representative substances such as TOC or VOC that can indicate the presence of a leak can also be used). A leak in the heat exchange system is detected if the exit mean concentration of HAP (or other representative substance) in the cooling water is at least 1 ppmw or 10 percent greater than (using a one-sided statistical procedure at the 0.05 level of significance) the entrance mean concentration of HAP (or other representative substance) in the cooling water. Furthermore, the PEPO NESHAP allows owners or operators to monitor for leaks using a surrogate indicator (*e.g.*, ion-specific electrode monitoring, pH, conductivity), provided that certain criteria in 40 CFR 63.104(c) are met. The PEPO NESHAP initially requires 6 months of monthly monitoring for existing heat exchange systems. Thereafter, the frequency can be reduced to quarterly. The leak monitoring frequencies are the same whether the owner or operator uses water sampling and analysis or surrogate monitoring to identify leaks.

As part of our technology review, we reviewed the criteria in 40 CFR 63.104 that exempt certain heat exchange systems from the LDAR requirements in the PEPO NESHAP to see if the exemptions were still reasonable to maintain. We identified two criteria in 40 CFR 63.104 dealing with once-through heat exchange systems meeting certain National Pollution Discharge Elimination System (NPDES) permit conditions (*i.e.*, 40 CFR 63.104(a)(3) and (4)) that warranted further assessment. Once-through heat exchange systems typically have systems open to the air (*e.g.*, open sewer lines, trenches, and ponds) that are utilized to transport used cooling water to a discharge point (*e.g.*, an outfall) of a facility. This cooling water can also be mixed with other sources of water (*e.g.*, cooling water used in once-through heat exchange systems in non-PEPO processes, stormwater, treated wastewater, *etc.*) in sewers, trenches, and ponds prior to discharge from the plant. If this point of discharge from the plant is into a "water of the United States," the facility is required to have a NPDES permit and to meet certain pollutant discharge limits. In reviewing the requirements of 40 CFR 63.104(a)(3), we find that there is a clear disconnect between having a NPDES permit that meets certain allowable discharge limits (*i.e.*, 1 part per million by volume (ppmv) or less above influent concentration, or 10 percent or less above influent concentration, whichever is greater) at the discharge point of a facility (*e.g.*, outfall) versus being able to adequately identify a leak from a once-through heat exchange system, given that these systems are open to the atmosphere prior to this discharge point and, therefore, any volatile HAP leaking from a once-through heat exchange system would likely be emitted to the atmosphere prior to the NPDES outfall. Similarly, while the requirements of 40 CFR 63.104(a)(4) allow facilities with once-through heat exchange systems that have certain requirements (*i.e.*, the requirements of 40 CFR 63.104(a)(3) and (4)) incorporated into their NPDES permit to not comply with the requirements of 40 CFR 63.104(b) and 63.104(c), we find this exemption to be problematic. Specifically, the NPDES requirements at 40 CFR 63.104(a)(4) lack the specificity of where a sample must be taken to adequately find and quantify a leak from a once-through heat exchange system (*e.g.*, just prior to the outfall from the plant versus from the

exit of the once-through heat exchange system prior to being open to atmosphere), what concentration and/or mass emissions rate constitutes a leak that must be fixed, how quickly a leak must be fixed, what pollutants must be adequately accounted for, and what test method(s)/surrogates facilities are allowed. As such, we find 40 CFR 63.104(a)(4) to be inadequate in terms of being able to detect and repair leaks that are at least as equivalent to those that would be identified if once-through heat exchange systems were complying with 40 CFR 63.104(b) or (c) instead. Therefore, for purposes of demonstrating continuous compliance with the underlying MACT standard, we are proposing at 40 CFR 63.1435(a), by reference to 40 CFR 63.104(a)(4)(v), to remove the exemptions for once-through heat exchange systems meeting certain NPDES permit conditions at 40 CFR 63.104(a)(3) and (4) and instead to require that facilities comply with the requirements of 40 CFR 63.104(b) and 63.104(c).

Our technology review identified one development in LDAR practices and processes for heat exchange systems (*i.e.*, broader than our review of heat exchange systems in EtO service discussed in section IV.B.2.c of this preamble): the use of the Modified El Paso Method[37] to monitor for leaks. The Modified El Paso Method is included in the HON, MON, EMACT standards, the Petroleum Refinery Sector rule, and in the RACT/BACT/LAER clearinghouse database. TCEQ also requires the method for facilities complying with TCEQ's highly reactive volatile organic compound (HRVOC) rule (*i.e.*, 30 Texas Administrative Code Chapter 115, Subchapter H, Division 3). The Modified El Paso Method measures a larger number of compounds than the current methods required in the PEPO NESHAP and is more effective in identifying leaks. For LDAR programs applied to heat exchange systems, the compliance monitoring option, leak definition, and frequency of monitoring for leaks are all important considerations affecting emission reductions because they identify when there is a leak and when

[37] The Modified El Paso Method uses a dynamic or flow-through system for air stripping a sample of the water and analyzing the resultant off-gases for VOC using a flame ionization detector (FID) analyzer. The method is described in detail in appendix P of the TCEQ's Sampling Procedures Manual: *The Air Stripping Method (Modified El Paso Method) for Determination of Volatile Organic Compound (VOC) Emissions from Water Sources*. Appendix P is included in the docket for this rulemaking.

to take corrective actions to repair the leak. Therefore, we evaluated the Modified El Paso Method for use at PEPO facilities, including an assessment of appropriate leak definitions and monitoring frequencies.

To identify an appropriate Modified El Paso Method leak definition for facilities subject to the PEPO NESHAP, we identified five rules (*i.e.*, TCEQ HRVOC rule, the HON, the MON, the EMACT standards, and the Petroleum Refinery Sector rule) that incorporate this monitoring method and have leak definitions corresponding to the use of this methodology. We also reviewed data submitted in response to a CAA section 114 request for PEPO production facilities. The TCEQ HRVOC rule, the HON, the MON, EMACT standards, and the Petroleum Refinery Sector rule have leak definitions of total strippable hydrocarbon concentration (as methane) in the stripping gas ranging from 3.1 ppmv to 6.2 ppmv. In addition, sources subject to the HON, the MON, EMACT standards, or the Petroleum Refinery Sector rule must repair a leak no later than 45 days after first identifying the leak and cannot delay the repair of leaks for more than 30 days where, during subsequent monitoring, owners or operators find a total strippable hydrocarbon concentration (as methane) in the stripping gas of 62 ppmv or higher. Taking into account the range of actionable leak definitions in use by other rules that require use of the Modified El Paso Method currently (*i.e.*, 3.1 ppmv to 6.2 ppmv of total strippable hydrocarbon (as methane) in the stripping gas), we chose to evaluate a leak definition at the upper end of identified actionable leak definitions in our analysis. Thus, we evaluated the Modified El Paso Method leak definition of 6.2 ppmv of total strippable hydrocarbon concentration (as methane) in the stripping gas for both new and existing heat exchange systems, along with not allowing delay of repair of leaks for more than 30 days where, during subsequent monitoring, a total strippable hydrocarbon concentration (as methane) in the stripping gas of 62 ppmv or higher is found.

We also considered more stringent monitoring frequencies. Both the Petroleum Refinery Sector rule, which includes monthly monitoring for existing sources under certain circumstances, and the TCEQ HRVOC rule, which includes continuous monitoring provisions for existing and

new sources, have more stringent monitoring frequencies. However, the petroleum refinery rule analysis found the incremental HAP cost effectiveness to change from quarterly to monthly monitoring and monthly to continuous monitoring (at the same leak definition) of refinery heat exchange systems to be $40,000/ton and $500,000/ton, respectively. We conclude that these costs are not reasonable for PEPO facilities. Thus, we chose to evaluate quarterly monitoring for existing and new heat exchange systems (*i.e.*, the base monitoring frequency currently in the rule). We also evaluated monthly monitoring to confirm the anticipated higher incremental HAP cost effectiveness.

Based on this technology review, we identified the following control options for heat exchange systems as a development in practice that can be implemented at a reasonable cost: (1) quarterly monitoring for existing and new heat exchange systems (after an initial 6 months of monthly monitoring) with the Modified El Paso Method and a leak definition of 6.2 ppmv of total strippable hydrocarbon concentration (as methane) in the stripping gas, and (2) same as Control Option 1, except monthly monitoring with the Modified El Paso Method instead of quarterly monitoring.

We then estimated the impacts of these control options assuming 24 PEPO facilities[38] would be affected by requiring the use of the Modified El Paso Method. As part of our analysis, we assumed owners or operators conducting monitoring for three or more heat exchange systems would elect to purchase a stripping column and FID analyzer and perform in-house Modified El Paso monitoring because the total annualized costs for in-house Modified El Paso monitoring are less than the costs for contracted services. In addition, we assumed that owners or operators could repair leaks by plugging a specific heat exchanger tube, and if a heat exchanger is leaking to the extent that it needs to be replaced, then it is effectively at the end of its useful life. Therefore, we determined that the cost of replacing a heat exchanger is an operational cost that

[38] We note that while there are 25 PEPO facilities, one PEPO facility is currently co-located with a HON facility. This facility is a small business that only receives and treats wastewater. Therefore, we do not expect this facility to have heat exchange systems on site.

would be incurred by the facility as a result of routine maintenance and equipment replacement, and it is not attributable to the control option.

Table 6 of this preamble presents the nationwide impacts for requiring owners or operators at PEPO facilities to use the Modified El Paso Method quarterly or monthly (Control Options 1 and 2), and repair leaks of total strippable hydrocarbon concentration (as methane) in the stripping gas of 6.2 ppmv or greater. See the document titled *Clean Air Act Section 112(d)(6) Technology Review for Heat Exchange Systems Located in the PEPO Production Source Category that are Associated with Processes Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking, for details on the assumptions and methodologies used in this analysis.

Table 6. Nationwide Emissions Reductions and Cost Impacts of Control Options Considered for Heat Exchange Systems at PEPO Facilities

Control Option	Total Capital Investment ($)	Total Annualized Costs w/o Credits ($/yr)	Total Annualized Costs w/Credits ($/yr)	Total HAP Emission Reductions (tpy)	Average HAP Cost-effectiveness w/Credits ($/ton)	Average HAP Cost-effectiveness w/o Credits ($/ton)	Average Incremental HAP Cost-effectiveness w/Credits ($/ton)
1	54,700	30,700	10,400	17.4	600	1,800	-
2	492,400	82,200	61,200	18.0	3,400	4,500	80,400

Based on the costs and emission reductions for the identified control options, we are proposing Control Option 1 to revise the PEPO NESHAP for heat exchange systems pursuant to CAA section 112(d)(6). We are not proposing Control Option 2 because it is not cost-effective given the high incremental total HAP cost effectiveness (*i.e.*, $80,400/ton HAP) from Control Option 1. We are proposing Control Option 1 at 40 CFR 63.1435, by reference to the HON (40 CFR 63.104(g)(4)),[39] to specify quarterly monitoring for existing and new heat exchange systems (after an initial 6 months of monthly monitoring) using the Modified El Paso Method and a leak definition of 6.2 ppmv of total strippable hydrocarbon concentration (as methane) in the stripping

[39] We note that each of the HON citations mentioned in this paragraph of this preamble are also applicable to PEPO facilities pursuant to 40 CFR 63.1435. For these HON citations to properly apply to PEPO facilities, we are proposing substitution rule text at 40 CFR 63.1435(f) and (g).

gas. We are proposing to require owners and operators to repair the leak to reduce the concentration or mass emissions rate to below the leak action level as soon as practicable, but no later than 45 days after identifying the leak. We are also proposing, by reference to 40 CFR 63.104(j)(3), a delay of repair action level of total strippable hydrocarbon concentration (as methane) in the stripping gas of 62 ppmv, that if exceeded during leak monitoring, would require immediate repair (*i.e.*, the leak found cannot be put on delay of repair and would be required to be repaired within 30 days of the monitoring event). This would apply to both monitoring heat exchange systems and individual heat exchangers by replacing the use of any 40 CFR part 136 water sampling method with the Modified El Paso Method and removing the option that allows for use of a surrogate indicator of leaks. We are also proposing, by reference to 40 CFR 63.104(h) and (i), that repair include re-monitoring at the monitoring location where a leak is identified to ensure that any leaks found are fixed. We are proposing that none of these requirements would apply to heat exchange systems that have a maximum cooling water flow rate of 10 gallons per minute or less because owners and operators of smaller heat exchange systems would be disproportionately affected and forced to repair leaks with a much lower potential HAP emissions rate than owners and operators of heat exchange systems with larger recirculation rate systems. Finally, we are proposing by reference to 40 CFR 63.104(l) that the leak monitoring requirements for heat exchange systems at 40 CFR 63.104(b) may be used in limited instances, instead of using the Modified El Paso Method, to monitor for leaks. We continue to maintain that the Modified El Paso Method is the preferred method to monitor for leaks in heat exchange systems and we are proposing that the requirements of 40 CFR 63.104(b) may only be used if 99 percent by weight or more of all the organic compounds that could potentially leak into the cooling water have a Henry's Law Constant less than 5.0E-6 atmospheres per mole per cubic meter (atm-m^3/mol) at 25° Celsius. As noted in the proposal for the HON amendments (88 FR 25080), we selected this threshold based on a review of Henry's Law Constants for the HAP listed in table 4 to 40 CFR part 63, subpart F, as well as the water-

soluble organic compounds listed in a recent alternative monitoring request from a MON facility.[40] Henry's Law Constants are available from the EPA at *https://comptox.epa.gov/dashboard/*. Examples of HAP that have a Henry's Law Constant less than 5.0E-6 atm-m^3/mol at 25° Celsius are: aniline; 2-chloroacetophenone; diethylene glycol diethyl ether; diethylene glycol dimethyl ether; dimethyl sulfate; 2,4-dinitrotoluene; 1,4-dioxane; ethylene glycol monoethyl ether acetate; ethylene glycol monomethyl ether acetate; methanol; and toluidine. Many of these HAP also have very high boiling points, with most above 300° Fahrenheit, which means they will generally stay in the cooling water and not be emitted to the atmosphere. We solicit comments on the proposed requirements related to heat exchange systems.

2. Standards for Storage Vessels

Storage vessels are used to store liquid and gaseous feedstocks for use in a process, as well as to store liquid and gaseous products from a process. Most PEPO storage vessels are designed for operation at atmospheric or near atmospheric pressures; pressure vessels are used to store compressed gases and liquefied gases. Atmospheric storage vessels are typically cylindrical with a vertical orientation, and they are constructed with either a fixed roof or a floating roof. Some, generally small, atmospheric storage vessels are oriented horizontally. Pressure vessels are either spherical or horizontal cylinders.

The HON storage vessel standards that PEPO affected sources are currently subject to, by reference to NESHAP subpart G at 40 CFR 63.119 through 63.123, require that owners and

[40] In May 2021, EPA Region 4 received a request from Eastman Chemical Company to perform an alternative method instead of the Modified El Paso Method to monitor for leaks in Eastman's Tennessee Operations heat exchange systems, which primarily have cooling water containing soluble HAP with a high boiling point. Eastman specifically identified two HAP (1,4-dioxane and methanol), which do not readily strip out of water using the Modified El Paso Method. Eastman's application for alternative monitoring included experimental data showing that the Modified El Paso Method would likely not identify a leak of these HAP in heat exchange system cooling water. Eastman conducted Modified El Paso Method monitoring under controlled scenarios to determine how much methanol and 1,4-dioxane would be detected. The scenarios included solutions of water and either methanol or 1,4-dioxane at concentrations of 1 ppmw, 20 ppmw, and 100 ppmw (as measured using water sampling methods allowed previously in the MON). The Modified El Paso Method did not detect any methanol or 1,4-dioxane from the 1 ppmw and 20 ppmw solutions (*i.e.*, methanol and 1,4-dioxane did not strip out of the water in detectable amounts). The Modified El Paso Method detected very little HAP from the 100-ppmw solutions, with a maximum of only 0.17 percent of the 1,4-dioxane stripping out and being detected.

operators control emissions from storage vessels with capacities between 75 m^3 (inclusive) and 151 m^3 and a MTVP greater than or equal to 13.1 kPa, and storage vessels with capacities greater than or equal to 151 m^3 and a MTVP greater than or equal to 5.2 kPa. Storage vessels meeting these capacity and size criteria capacity are considered Group 1 storage vessels. Generally, the standards in the PEPO NESHAP for storage vessels refer to the provisions in the HON. As such, owners and operators of PEPO Group 1 storage vessels storing a liquid with a MTVP of total organic HAP less than 76.6 kPa must reduce emissions of organic HAP by 95 percent (or 90 percent if the storage vessel was installed on or before September 4, 1997) using a closed vent system and control device, or reduce organic HAP emissions either by utilizing an IFR or EFR, routing the emissions to a process or a fuel gas system, or through vapor balancing. Owners and operators of PEPO Group 1 storage vessels containing a liquid with a MTVP of total organic HAP greater than or equal to 76.6 kPa must reduce emissions of organic HAP by 95 percent (or 90 percent if the storage vessel was installed on or before September 4, 1997) utilizing a closed vent system and control device, or reduce organic HAP emissions by routing the emissions to a process or a fuel gas system, or using vapor balancing. In general, PEPO storage vessels that do not meet the MTVP and capacity thresholds described above are considered Group 2 storage vessels and owners or operators are not required to apply any additional emission controls provided they remain under Group 1 thresholds; however, Group 2 storage vessels are subject to certain monitoring, reporting, and recordkeeping requirements to ensure that they were correctly determined to be Group 2 storage vessels and that they remain in Group 2.

As part of our technology review for PEPO storage vessels (*i.e.*, broader than our review of storage vessels in EtO service discussed in section IV.B.2.a of this preamble), we identified the following emission reduction options: (1) revising the capacity and MTVP thresholds of the PEPO NESHAP to reflect the HON existing source threshold which requires existing storage vessels between 38 m^3 (inclusive) and 151 m^3 with an MTVP greater than or equal to 6.9 kPa to reduce emissions of organic HAP by 95 percent utilizing a closed vent system and control

device, or reduce organic HAP emissions either by utilizing an IFR, an EFR, by routing the emissions to a process or a fuel gas system, or using vapor balancing; (2) same as Control Option 1 plus requiring upgraded deck fittings[41] and controls for guidepoles for all storage vessels equipped with an IFR as already required in 40 CR 63, subpart WW (NESHAP for Storage Vessels - Control Level 2); and (3) in addition to requirements specified in Control Options 1 and 2, requiring the conversion of EFRs to IFRs through use of geodesic domes and upgrades to deck fittings and guidepoles.

We identified Control Option 1 as a technologically feasible development in practices, processes, and control technologies for storage vessels used at PEPO facilities because it reflects requirements for similar storage vessels that are located at chemical manufacturing facilities subject to the HON. Control Option 2 is an improvement in practices because these upgraded deck fittings and guidepole controls have been required by other regulatory agencies and other EPA regulatory action (*e.g.*, Petroleum Refinery Sector rulemaking) since promulgation of the PEPO NESHAP. Finally, we consider Control Option 3 to be a development in control technology because we found that some storage vessels with EFRs have installed geodesic domes since promulgation of the PEPO NESHAP.

We used information about storage vessel capacity, design, and stored materials that industry provided to the EPA in response to our CAA section 114 request (see section II.C of this preamble) to evaluate the impacts of all three of the options presented. We did not identify any PEPO storage vessels from our CAA section 114 request that would be impacted by Control Option 1. Given that materials used in PEPO production have very low vapor pressures, the majority of PEPO Group 2 storage vessels do not meet the vapor pressure portion of the revised Control Option 1 applicability. Furthermore, our CAA section 114 request data shows zero Group 2 storage vessels fitted with an IFR or EFR, meaning no additional storage vessels would

[41] Require all openings in an IFR (except those for automatic bleeder vents (vacuum breaker vents), rim space vents, leg sleeves, and deck drains) be equipped with a deck cover; and require the deck cover to be equipped with a gasket between the cover and the deck.

be affected by Control Option 2 or 3. To verify these findings, we conducted an air permit review alongside analysis of our CAA section 114 request data to identify any additional Group 2 storage vessels at PEPO facilities outside of the CAA section 114 respondents. We reviewed title V permits for the remaining 16 facilities subject to the PEPO NESHAP and determined that no additional Group 2 storage vessels would be affected by any of the aforementioned options. Based on these analyses, we estimate that applying any of the aforementioned options to the PEPO NESHAP would not result in cost impacts or emission reductions for PEPO facilities. See the document titled *Clean Air Act Section 112(d)(6) Technology Review for Storage Vessels Located in the PEPO Production Source Category that are Associated with Processes Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking, for details on the assumptions and methodologies used in this analysis.

We are proposing storage vessel Control Option 2 (which includes Control Option 1), pursuant to CAA section 112(d)(6), to revise the Group 1 storage capacity criterion for PEPO storage vessels at new and existing sources from between 75 m^3 (inclusive) and 151 m^3 to between 38 m^3 (inclusive) and 151 m^3 (see proposed table 3 to 40 CFR part 63, subpart PPP), and to require upgraded deck fittings and controls for guidepoles for all storage vessels equipped with an IFR as already required in 40 CFR part 63, subpart WW (see proposed 40 CFR 63.1432 which refers to the HON including 40 CFR 63.119(b)(5)(ix), (x), (xi), and (xii)). We note that the EPA recently finalized these same options for the HON, finding them to be cost effective for HON storage vessels (see 89 FR 42932, May 16, 2024). Given that the PEPO NESHAP directly references the HON storage vessel provisions (40 CFR part 63, subpart G), we believe it is reasonable for PEPO facilities to comply with these same final HON provisions. Although we did not find any PEPO storage vessels that would be affected by these proposed provisions, we believe it would be unnecessarily cumbersome to exclude these vessels by caveat in the storage vessel provisions of the PEPO NESHAP. Also, given that the EPA determined that Control Option 3 was not cost effective and did not propose this option for HON storage vessels, we are

not proposing to revise the PEPO NESHAP to reflect the requirements of Control Option 3 pursuant to CAA section 112(d)(6). Materials used in PEPO production have very low vapor pressures so we anticipate that the cost effectiveness of Control Option 3 would be worse for PEPO storage vessels. We also anticipate that EFR storage vessels would not be considered for any new PEPO affected sources given we did not identify any existing EFR storage vessels subject to the PEPO NESHAP. We solicit comments on the proposed revisions for storage vessels.

3. Standards for Process Vents

A process vent is a gas stream that is discharged during the operation of a particular unit operation (*e.g.*, separation processes, purification processes, mixing processes, reaction processes). The gas stream(s) may be routed to other unit operations for additional processing (*e.g.*, a gas stream from a reactor that is routed to a distillation column for separation of products), sent to one or more recovery devices, sent to a process vent header collection system (*e.g.*, blowdown system) and APCD (*e.g.*, flare, thermal oxidizer, carbon adsorber), and/or vented to the atmosphere. Process vents may be generated from continuous and/or batch operations, as well as from other intermittent types of operations (*e.g.*, maintenance operations). If process vents are required to be controlled prior to discharge to the atmosphere to meet an applicable emissions standard, then they are typically collected and routed to an APCD through a closed vent system.

The PEPO NESHAP specifies process vent control provisions for affected sources depending on the type of PEPO production process used: (1) polymerization of epoxides, or (2) polymerization of THF. Typically, PEPO processes that use epoxide reactants are batch processes, although some epoxide reactions are continuous, while production processes that use THF are continuous. For the PEPO production processes that use epoxides as a reactant, the NESHAP groups the process vent control provisions based on the function of the organic HAP in the production process and the resulting HAP emissions. Table 7 of this preamble shows the

process vent emission standards of the PEPO NESHAP for each of these groups for existing and new affected sources.

Table 7. Process Vent Emission Standards in the PEPO NESHAP for Affected Sources That Produce PEPO Using Epoxide Reactants

Process Vent Group	Process Vent Standards for Existing Affected Sources	Process Vent Standards for New Affected Sources
Epoxides emissions	• 98-percent aggregate reduction of total epoxide emissions;[1] • flare total epoxide emissions; • maintain an outlet concentration of ≤ 20 ppmv of total epoxides or TOC; or • maintain ≤ $1.69x10^{-2}$ kilograms of epoxide emissions per megagram of product made.	• 99.9 percent aggregate reduction of total epoxide emissions;[1] • maintain an outlet concentration ≤ 20 ppmv of total epoxides or TOC; or • maintain ≤ $4.43x10^{-3}$ kilograms of epoxide emissions per megagram of product made.
Nonepoxide organic HAP emissions from making or modifying the product	Group 1 combination of process vents from batch unit operations: • 90-percent aggregate emission reduction; or • flare emissions from all vents. Group 1 process vents from continuous unit operations: • 98-percent aggregate emission reduction; or • flare emissions.	Same as existing affected sources.
Nonepoxide organic HAP emissions from catalyst extraction	• 90-percent aggregate emission reduction; or • flare emissions from all vents.	Same as existing affected sources.

[1] The PEPO NESHAP allows the use of ECO as a means of reducing emissions by the required percentage (98 or 99.9 percent) or complying with the production-based limits ($1.69x10^{-2}$ or $4.43x10^{-3}$). This pollution prevention technique reduces emissions by extending the time of reaction, thus leaving less unreacted epoxides to be emitted downstream. To demonstrate a percent efficiency, it is necessary to designate the basis, or the "uncontrolled" emissions, for assessing the percent reduction. The point where uncontrolled emissions are to be assessed, called the "onset" of the ECO, is defined in the PEPO NESHAP as the point when the epoxide concentration in the reactor liquid is equal to 25 percent of the concentration of epoxide in the liquid at the end of the epoxide feed.

For the control requirements for nonepoxide organic HAP from making or modifying the product specified in table 7 of this preamble, owners or operators must determine whether the process vent is a Group 1 or Group 2 process vent. The PEPO NESHAP defines a "Group 1 combination of batch process vents" as a collection of process vents in a PMPU from batch unit operations that are associated with the use of a nonepoxide organic HAP to make or modify the product that has: (1) annual nonepoxide organic HAP emissions of 11,800 kg/yr (approximately

26,014 lb/yr) or greater, and (2) a cutoff flow rate that is greater than or equal to the annual average flow rate. The PEPO NESHAP defines a “Group 1 continuous process vent” as a process vent from a continuous unit operation that is associated with the use of a nonepoxide organic HAP to make or modify the product and that has: (1) a flow rate greater than or equal to 0.005 standard cubic meters per minute (scmm), (2) a total organic HAP concentration greater than or equal to 50 ppmv, and (3) a total resource effectiveness (TRE) index value less than or equal to 1.0. As discussed further below, the TRE index value is a measure of the supplemental total resource requirement per unit VOC (or HAP) reduction. The PEPO NESHAP defines a Group 2 process vent as a process vent that is associated with the use of a nonepoxide organic HAP to make or modify the product that is not classified as either a Group 1 combination of batch process vents or a Group 1 continuous process vent. In general, Group 2 process vents are not required to apply any additional emission controls; however, they are subject to certain monitoring, reporting, and recordkeeping requirements to ensure that they were correctly determined to be Group 2 and that they remain Group 2.

The HON process vent standards that certain PEPO affected sources (*i.e.*, those that produce PEPO using THF) are currently subject to require a Group 1/Group 2 determination:

- A Group 1 process vent associated with a PMPU using THF is a process vent for which the vent stream flow rate is greater than or equal to 0.005 scmm, the total organic HAP concentration is greater than or equal to 50 ppmv, and the TRE index value is less than or equal to 1.0. Owners or operators of Group 1 process vents at PEPO processes that use THF are required to either: reduce emissions of organic HAP using a flare meeting 40 CFR 63.11(b); reduce emissions of total organic HAP or TOC by 98 weight percent or to an exit concentration of 20 ppmv, whichever is less stringent; or achieve and maintain a TRE index value greater than 1.0.

- A Group 2 process vent associated with a PMPU using THF is process vent for which the vent stream flow rate is less than 0.005 scmm, the total organic HAP concentration is less than 50 ppmv, or the TRE index value is greater than 1.0.

As previously mentioned in this section of the preamble, the PEPO NESHAP contains a TRE index value threshold of 1.0 as part of the criteria used to determine whether owners or operators must control continuous process vents associated with nonepoxide organic HAP from making or modifying product and process vents associated with affected sources that produce PEPO using THF. In both of these process vent scenarios, the PEPO NESHAP requires owners or operators to calculate the TRE index using the procedures in the HON. The TRE index value accounts for all the resources which are expected to be used in VOC (or HAP) control by thermal oxidation and provides a dimensionless measure of resource burden based on cost effectiveness. Resources include supplemental natural gas, labor, and electricity. Additionally, if the off-gas contains halogenated compounds, resources will also include caustic and scrubbing and quench makeup water. For the PEPO NESHAP, owners or operators derive the TRE index value from the cost effectiveness associated with HAP control by a flare or thermal oxidation, and is a function of vent stream flowrate, vent stream net heating value, hourly emissions, and a set of coefficients. The EPA first introduced the TRE index value in an Agency document titled: *Guideline Series for Control of Volatile Organic Compound (VOC) Emissions from Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry (SOCMI)* (see EPA-450/3-84-015, December 1984). The EPA incorporated the TRE concept into the original HON (see 59 FR 19468, April 22, 1994) and the original PEPO NESHAP rulemaking (see 64 FR 29420, June 1, 1999). The PEPO NESHAP uses the TRE index value as an alternative mode of compliance for process vent regulations. The TRE index value can also trigger monitoring, recordkeeping, and reporting requirements. For additional details regarding the TRE index value (including the equation and coefficients used to calculate the TRE index value for the PEPO NESHAP), see the document titled *Clean Air Act Section 112(d)(6) Technology Review for*

Batch and Continuous Process Vents in the PEPO Production Source Category that are Associated with Processes Subject to the PEPO NESHAP, which is available in the docket for this rulemaking.

Our technology review for PEPO process vents (*i.e.*, broader than our review of process vents in EtO service discussed in section IV.B.2.a of this preamble) did not identify any control options associated with: (1) epoxide (*i.e*., EtO, propylene oxide, and epichlorohydrin) emissions resulting from the use of these chemicals as reactants, or (2) emissions of nonepoxide organic HAP resulting from their use in catalyst extraction. However, we identified the following emission reduction options as part of our technology review for continuous process vents associated with nonepoxide organic HAP from making or modifying product and process vents associated with affected sources that produce PEPO using THF: (1) remove the TRE concept in its entirety, remove the 50-ppmv and 0.005-scmm Group 1 process vent thresholds, and redefine a Group 1 process vent as any process vent that emits greater than or equal to 1.0 pound per hour (lb/hr) of total organic HAP; (2) the same requirements specified in Control Option 1, but redefine a Group 1 process vent as any process vent that emits greater than or equal to 0.10 lb/hr of total organic HAP; and (3) retain the TRE concept and the 50-ppmv and 0.005-scmm Group 1 process vent thresholds, but increase the TRE index value threshold from 1.0 to 5.0.

We identified Control Options 1 and 2 as developments in practices, processes, and control technologies for multiple reasons. First, we identified at least two chemical manufacturing NESHAP (*i.e.*, EMACT standards and the HON) that do not use the TRE index value as criteria for determining whether a process vent should be controlled.[42] Second, based on the responses to our CAA section 114 request (see section II.C of this preamble), we observed that some facilities are voluntarily controlling continuous process vents that are not required to be controlled per the results of the TRE index value calculation. Of the 13 HON facilities that

[42] The EPA recently removed the TRE index value from the HON (see 89 FR 42932, May 16, 2024). The EMACT standards never used the TRE index value.

received the CAA section 114 request, at least three facilities confirmed they were voluntarily controlling some of their Group 2 process vents. We expect PEPO facilities will also voluntarily control some of their Group 2 process vents, because facilities responded in the CAA section 114 request that, pursuant to 40 CFR 63.113(h), many of their process vents are voluntarily designated as Group 1 process vents "so that TRE calculations are not required." In other words, some facilities are likely electing to control certain process vents that have TRE index values greater than 1.0.[43] Third, based on the responses to our CAA section 114 request, we observed that facilities are routing multiple continuous process vents to a single APCD. This practice is significant because the current use of the TRE index value is only based on controlling a single process vent with a single APCD, which is an unrealistic scenario when compared to how chemical manufacturing facilities actually control their process vents. We believe that it is much more likely that a facility routes numerous process vents to the same APCD. Finally, we concluded that the TRE index is difficult to enforce because it is largely a theoretical characterization tool that incorporates numerous input values provided by owners or operators, and verifying the inputs without site-specific process knowledge can be problematic. We based our conclusion on a response to the CAA section 114 request received from one facility that provided over 300 pages of modeled runs that the facility used to help determine certain characteristics of their continuous process vents for use as inputs to TRE index value calculations (the facility had originally included these modeled runs with their Notification of Compliance Status report for the HON). Our review of this information identified numerous instances where the facility noted difficulties or uncertainties associated with modeling the process vent characteristics.

[43] None of the nine PEPO facilities that received our CAA section 114 request reported having any Group 2 continuous process vents associated with processes subject to the PEPO NESHAP; and only one of these facilities designated eight of their process vents as Group 1 continuous process vents subject to the PEPO NESHAP. We note that facilities can voluntarily designate a Group 2 process vent as a Group 1 process vent and control it according to Group 1 requirements. In these instances, the owner or operator is not required to keep calculations supporting a TRE index value. Therefore, it is possible that some of these Group 1 process vents are Group 2 process vents designated as Group 1 process vents.

We identified Control Option 3 as a development in practices, processes, and control technologies because we determined that another chemical manufacturing NESHAP (*i.e.*, the MON) contains a TRE index value threshold criteria (*i.e.*, less than or equal to 1.9) that is more stringent than the PEPO NESHAP TRE index value threshold criteria (*i.e.*, less than or equal to 1.0). Additionally, we identified one State regulatory agency rule that uses a more stringent TRE index value threshold than the value specified in the PEPO NESHAP.[44]

To evaluate impacts of the three control options presented above, we used information for approximately 50 continuous process vents designated as Group 2 that was provided by nine of the 13 HON facilities that received the CAA section 114 request. We determined it was reasonable to use the CAA section 114 response data for HON Group 2 process vents to extrapolate impacts for certain continuous Group 2 process vents subject to the PEPO NESHAP given that PMPU sources subject to the PEPO NESHAP are similar to CMPU (chemical manufacturing process unit) sources that are subject to the HON. Additionally, there are 15 PEPO facilities co-located with HON facilities; therefore, we believe it is reasonable to assume that developments in practices, processes, and control technologies would be implemented across the entire facility, given the similarities between HON and PEPO process units. We also reviewed several air emissions permits issued by State regulatory agencies to validate our assumptions and estimates of the number of Group 2 process vents located at PEPO facilities. Although we were unable to determine the exact number of Group 2 process vents (both continuous and batch) that are located at each PEPO facility, we believe that, based on our air permit review, our Group 2 process vent estimates are reasonable. It is evident from our air permit review that some PEPO facilities have between one and six Group 2 process vents.

[44] See Illinois Title 35: Subtitle B: Chapter I: Subchapter C: Parts 218 and 219 (*i.e.*, Organic Material Emission Standards And Limitations For The Chicago Area Subpart V: Batch Operations And Air Oxidation Processes; and Organic Material Emission Standards And Limitations For The Metro East Area Subpart V: Batch Operations And Air Oxidation Processes). However, it is unlikely to be applicable to process vents in the PEPO Production source category because it applies specifically to air oxidation processes, which are not typically used in PEPO production.

We estimated that process vent Control Option 1 would impact four PEPO facilities; one facility would need to install a thermal oxidizer and three facilities would either use existing controls or are already voluntarily controlling their Group 2 process vents. We estimated that process vent Control Option 2 would impact eight PEPO facilities; five facilities would need to install a thermal oxidizer and three facilities would either use existing controls or are already voluntarily controlling their Group 2 process vents. For process vent Control Option 3, we estimated that four PEPO facilities would be impacted by this option with one PEPO facility needing to install a thermal oxidizer and three facilities using either existing controls or are already voluntarily controlling their Group 2 process vents (*i.e.*, the same impacts as estimated for process vent Control Option 1). We then used information about the composition of process vent streams, net heating value, and volumetric and mass flow rate that industry provided to the EPA in response to the CAA section 114 request for HON Group 2 process vents to estimate the total capital investment and total annual cost of: (1) installing thermal oxidizers for reducing HAP emissions from certain PEPO Group 2 process vents, or (2) installing ductwork and a blower to route certain PEPO Group 2 process vents to an existing control device. For facilities that would need to install a thermal oxidizer, we used a total capital investment of $1,000,000 provided by commenters in the HON rulemaking (see 89 FR 42932, May 16, 2024). For total annual cost, we used the value the Agency determined for the HON rulemaking ($377,000 after adjusting for a higher interest rate and year 2022 dollars) for installing a new recuperative thermal oxidizer with 70-percent energy recovery following the procedures contained in the EPA Control Cost Manual.[45] For facilities that would not need to install a thermal oxidizer and would instead route Group 2 process vent emissions to an existing control device at the facility, we also estimated the average total capital investment and total annual cost values and emission reductions to install ductwork and a blower using the EPA Control Cost Manual.

[45] EPA, 2002. *EPA Control Cost Manual*, Sixth Edition. January 2002. Publication Number EPA/452/B-02-001.

Table 8 of this preamble presents the nationwide impacts for the three options considered for continuous process vents associated with nonepoxide organic HAP (from making or modifying product) and process vents associated with affected sources that produce PEPO using THF. We determined that Control Option 1 is cost effective; therefore, we are proposing, pursuant to CAA section 112(d)(6), to remove the TRE concept in its entirety from the PEPO NESHAP (see proposed 40 CFR 63.1425(c)(4) and (f)(7), 63.1428(h) and (i), 63.1429(b)(2), and 63.1430(e)(2), (f)(2) through (f)(5), and (j)). We are also proposing, pursuant to CAA section 112(d)(6), to remove the 50-ppmv and 0.005-scmm thresholds from the Group 1 definition for continuous process vents at 40 CFR 63.1423(b) associated with nonepoxide organic HAP and the Group 1 process vent applicability associated with a PMPU using THF, and instead require owners and operators of these process vents that emit greater than or equal to 1.0 lb/hr of total organic HAP to meet the current control standards in the PEPO NESHAP. We are also proposing to revise 40 CFR 63.1430(g)(3) to align to the proposed 1.0 lb/hr threshold. In this action, we are not proposing to revise the PEPO NESHAP to reflect the requirements of process vent Control Options 2 and 3 pursuant to CAA section 112(d)(6). We determined that process vent Control Option 2 is not cost effective, and while we believe Control Option 3 is cost effective, it would require retaining the TRE concept in the rule which, for the reasons explained above, we believe is not desirable. We solicit comments on the proposed revisions to the process vent requirements for the PEPO NESHAP.

Table 8. Nationwide Emissions Reductions and Cost Impacts of Control Options Considered for Certain Process Vents[1] at PEPO Facilities

Control Option	Total Capital Investment ($)	Total Annualized Costs ($/yr)	VOC Emission Reductions (tpy)	HAP Emission Reductions (tpy)	HAP Cost-effectiveness ($/ton)
1	1,023,000	380,000	45	45	$8,500
2	3,040,000	1,135,000	34	21	$53,700
3	1,023,000	380,000	37	37	$10,200

[1] For continuous process vents associated with nonepoxide organic HAP (from making or modifying product) and process vents associated with affected sources that produce PEPO using THF.

As part of our technology review for the combination of batch process vents that are associated with the use of a nonepoxide organic HAP to make or modify the product, we identified the following emission reduction option: revise the PEPO NESHAP control threshold from 26,014 lb/yr to 10,000 lb/yr and remove the associated flow rate applicability threshold. We identified this option as a development in practices, processes, and control technologies based on our comparison of the batch process vent requirements in the NESHAP for Chemical Manufacturing Area Sources (CMAS) to those specified in the PEPO NESHAP. Also, as part of a recent technology review, the EPA updated the Group I Polymers and Resins (P&R I) NESHAP (see 89 FR 42932, May 16, 2024) to reflect the applicability threshold used in the CMAS NESHAP. We note that the CMAS NESHAP regulates batch process vents from nine area source categories in the chemical manufacturing sector. Owners and operators of a CMAS CMPU with collective uncontrolled organic HAP emissions greater than or equal to 10,000 lb/yr from all batch process vents associated with an affected CMPU must meet emission limits for organic HAP emissions. The CMAS NESHAP defines GACT for batch process vents as 85-percent control for existing batch process units (and 90-percent control for new units) that have uncontrolled organic HAP emissions equal to or greater than 10,000 lb/yr. As discussed in the CMAS NESHAP rulemaking,[46] the EPA also used the applicability threshold of 10,000 lb/yr per batch process in the MON and this threshold indicates the size of a CMPU because the MON applies to major sources of HAP. The EPA used information from the baseline facility MON database and determined that costs to meet an 85-percent control requirement for existing CMAS CMPUs with uncontrolled organic HAP emissions equal to or greater than 10,000 lb/yr were reasonable ($8,700/ton). We note that the applicability threshold for uncontrolled organic HAP emissions of 10,000 lb/yr used in the CMAS NESHAP is more stringent than the applicability threshold of 26,014 lb/yr specified in the PEPO NESHAP for nonepoxide organic HAP emitted

[46] See 74 FR 56008, October 29, 2009.

from Group 1 combination of batch process vents that are associated with the use of a nonepoxide organic HAP to make or modify the product.

To evaluate impacts of the option presented for the combination of batch process vents that are associated with the use of a nonepoxide organic HAP to make or modify the product, we used information from the batch process vent impacts analysis for the CMAS final rule.[47] We selected the model plant for the 90-percent control option shown in table 3 of the CMAS NESHAP impacts analysis memorandum for sources subject to the PEPO NESHAP (instead of the 85-percent control option model plant shown in table 2 of the impacts analysis memorandum) to prevent backsliding of the current PEPO NESHAP requirements, which reflect MACT instead of the GACT standards of the CMAS NESHAP. We assumed that all facilities subject to the PEPO NESHAP, except for the nine that received our CAA section 114 request,[48] have batch process vents that would require control under the option evaluated (*i.e.*, under the option to change the Group 1 combination of batch process vents threshold to 10,000 lb/yr). Additionally, we determined that one facility is a small business that is co-located with a HON facility, and already accounted for under the recent HON rulemaking (see 89 FR 42932, May 16, 2024). As a result, we estimated impacts to the remaining 15 PEPO facilities.

Table 9 of this preamble presents the nationwide impacts for the option considered for the combination of batch process vents that are associated with the use of a nonepoxide organic HAP to make or modify the product at PEPO facilities. We determined that this option is cost effective, and we are proposing, pursuant to CAA section 112(d)(6), to remove the Group 1 process vent thresholds of annual organic HAP emissions mass flow rate, cutoff flow rate, and the annual average batch vent flow rate from the definition of "Group 1 combination of batch

[47] RTI, 2009. *Revised Impacts Analysis for Batch Process Vents Chemical Manufacturing Area Source NESHAP*. October 14, 2009. EPA Docket No. EPA-HQ-OAR-2008-0334-0075.

[48] None of the nine PEPO facilities reported having any Group 2 combinations of batch process vents associated with processes subject to the PEPO NESHAP; however, five of the nine facilities reported having several Group 1 combinations of batch process vents subject to the PEPO NESHAP. We note that facilities can voluntarily designate a Group 2 process vent a Group 1 process vent and control it according to Group 1 requirements. In these instances, the owner or operator is not required to keep calculations supporting a TRE index value. Therefore, it is possible that some of these Group 1 process vents are Group 2 process vents designated as Group 1 process vents.

process vents” specified in the PEPO NESHAP at 40 CFR 63.1423(b). We are also proposing to remove rule text associated with these process vent thresholds at 40 CFR 63.1428(c), (d), and (e). Instead, using the procedures specified in 40 CFR 63.1428(b), owners and operators of Group 1 combination of batch process vents that release a total of annual nonepoxide organic HAP emissions greater than or equal to 4,536 kg/yr (10,000 lb/yr) would be required at 40 CFR 63.1425(c) to reduce emissions of nonepoxide organic HAP from these process vents using a flare meeting the proposed operating and monitoring requirements for flares (see section IV.D.1 of this preamble); or reduce emissions of nonepoxide organic HAP by 90 percent by weight. We are also proposing to revise 40 CFR 63.1430(e)(1)(vii) to align to the proposed 4,536 kg/yr threshold. We solicit comments on the proposed revisions to the PEPO NESHAP for the combination of batch process vents that are associated with the use of a nonepoxide organic HAP to make or modify the product.

Table 9. Nationwide Emissions Reductions and Cost Impacts of the Control Option Considered for the Combination of Batch Process Vents (That Are Associated With the Use of a Nonepoxide Organic HAP to Make or Modify the Product) at PEPO Facilities

Control Option	Total Capital Investment ($)	Total Annualized Costs ($/yr)	VOC Emission Reductions (tpy)	Organic HAP Emission Reductions (tpy)	Organic HAP Cost-effectiveness ($/ton)
1	778,950	625,050	87.8	87.8	7,120

For further details on our assumptions and methodologies used in these analyses, see the document titled *Clean Air Act Section 112(d)(6) Technology Review for Batch and Continuous Process Vents in the PEPO Production Source Category that are Associated with Processes Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking.

4. Standards for Wastewater

As previously mentioned in this preamble, HAP are emitted from wastewater collection, storage, and treatment systems that are uncovered or open to the atmosphere through volatilization of organic compounds at the liquid surface. Emissions occur by diffusive or convective means, or both. Diffusion occurs when organic concentrations at the water surface are

much higher than ambient concentrations. The organics volatilize, or diffuse into the air, to reach equilibrium between aqueous and vapor phases. Convection occurs when air flows over the water surface, which reduces the concentration at the boundary layer between the liquid and air, thereby sweeping organic vapors from the water surface into the air. The rate of volatilization is related directly to the speed of the air flow over the water surface.

The PEPO NESHAP defines wastewater to mean water that contains either: (1) an annual average concentration of compounds specified in table 4 to 40 CFR part 63, subpart PPP, of at least 5 ppmw and has an annual average flow rate of 0.02 liters per minute (lpm) or greater, or (2) an annual average concentration of compounds specified in table 4 to 40 CFR part 63, subpart PPP, of at least 10,000 ppmw at any flow rate. The PEPO NESHAP definition of wastewater also includes water discarded from a PMPU that is part of an affected source (see 40 CFR 63.1420(a) for the definition of an affected source). Wastewater can be process wastewater or maintenance wastewater. For process and maintenance wastewaters, and certain liquid streams in open systems within a PMPU, the PEPO NESHAP defines Group 1 wastewater streams at existing and new sources as having a total annual average concentration of compounds specified in table 4 to 40 CFR part 63, subpart PPP, that are also in table 9 to 40 CFR part 63, subpart G, greater than or equal to 10,000 ppmw at any flow rate, or greater than or equal to 1,000 ppmw with an annual average flow rate greater than or equal to 10 liters per minute. The HON wastewater standards that PEPO sources are currently subject to directly reference (with differences specified in 40 CFR 63.1433(a)) NESHAP subpart G at 40 CFR 63.132 through 63.147, which provide owners and operators several control options for wastewater tanks, surface impoundments, containers, individual drain systems, and oil-water separators. NESHAP subpart G also specifies performance standards for treating wastewater streams using open or closed biological treatment systems or using a design steam stripper with vent control. For APCDs (*e.g.*, thermal oxidizers) used to control emissions from collection system components, steam strippers, or closed biological treatment systems, NESHAP subpart G provides owners or

operators several compliance options, including 95-percent destruction efficiency, a 20-ppmv outlet concentration, or temperature and residence time design specifications for enclosed combustion devices.

The HON maintenance wastewater standards that PEPO sources are currently subject to directly reference (with exceptions specified in 40 CFR 63.1433(b)) NESHAP subpart F at 40 CFR 63.105, which requires owners or operators to prepare a description of the maintenance procedures for managing wastewaters generated from the emptying and purging of equipment during shutdowns, maintenance, and repair. For certain liquid streams in open systems within a PMPU, NESHAP subpart G requires drain, manhole, lift station, and trench components to be equipped with a tightly fitting solid cover, a cover with vent control, or water seals; pipes to have no visible gaps or other emissions interfaces; oil/water separators to be equipped with a fixed roof with vent control or a floating roof; and tanks to have a fixed roof (with vent control if the tank contents are sparged, are heated, or are treated using an exothermic reaction).

As part of our CAA section 112(d)(6) technology review for PEPO wastewater streams (*i.e.*, broader than our review of wastewater streams in EtO service discussed in section IV.B.2.d of this preamble), we evaluated tightening the PEPO wastewater Group 1 applicability thresholds. Specifically, we evaluated the option to require owners and operators to manage and treat existing wastewater streams with total annual average concentration of compounds specified in table 4 to 40 CFR part 63, subpart PPP (that are also in table 9 to NESHAP subpart G) greater than or equal to 1,000 ppmw at any flow rate, or greater than or equal to 10 ppmw at a flow rate of 10 lpm or greater.

Table 10 of this preamble presents the nationwide costs and impacts for the wastewater stream control option considered for PEPO facilities. For details on the assumptions and methodologies used in this analysis, see the document titled *Clean Air Act Section 112(d)(6) Technology Review for Wastewater Streams Located in the PEPO Production Source Category*

that are Associated with Processes Subject to the PEPO NESHAP, which is available in the docket for this rulemaking.

Table 10. Nationwide Emissions Reductions and Cost Impacts of the Control Option Considered for Wastewater Streams at PEPO Facilities

Control Option	Total Capital Investment ($)	Total Annualized Costs ($/yr)	VOC Emission Reductions (tpy)	Organic HAP Emission Reductions (tpy)	Organic HAP Cost Effectiveness ($/ton)
1	57,128,000	22,600,000	693	693	32,600

We determined that the option to revise wastewater stream Group 1 threshold applicability in the PEPO NESHAP (*i.e.*, to require control of existing wastewater streams with total annual average concentration of table 4 to subpart PPP compounds (that are also in table 9 to NESHAP subpart G) greater than or equal to 1,000 ppmw at any flow rate, or greater than or equal to 10 ppmw at a flow rate of 10 lpm or greater) is not cost effective based on the costs and emission reductions presented. Therefore, we are not proposing to revise the PEPO NESHAP to reflect the requirements of this option pursuant to CAA section 112(d)(6).

5. Standards for Equipment Leaks

As previously mentioned in this preamble, emissions of VOC and HAP from equipment leaks occur in the form of gases or liquids that escape to the atmosphere through many types of connection points (*e.g.*, threaded fittings) or through the moving parts of certain types of process equipment during normal operation. Equipment regulated by the PEPO NESHAP includes agitators, compressors, connectors, instrumentation systems, OEL, PRDs, pumps, sampling collection systems, and valves that contain or contact material having 5 percent by weight or more of organic HAP, operate 300 hours per year or more, and are not in vacuum service.

The equipment leak standards that PEPO sources are currently subject to directly reference the provisions in the HON at 40 CFR part 63, subpart H, which require LDAR using monitoring with EPA Method 21 of appendix A-7 to 40 CFR part 60 at certain frequencies (*e.g.*, monthly, quarterly, every 2 quarters, annually) and varying leak definitions (*e.g.*, 500 ppmv;

1,000 ppmv; 10,000 ppmv) depending on the type of component and service (*e.g.*, in gas and vapor service or in light liquid service). The LDAR requirements for components in heavy liquid service include sensory monitoring (*e.g.*, visual, audible, olfactory).

The practices, processes, and control technologies we considered during MACT development for equipment leaks at PEPO facilities included LDAR and equipment standards. To identify developments for the technology review, we evaluated responses to our CAA section 114 request, the RACT/BACT/LAER database, and other Federal regulations (*i.e.*, the Petroleum Refinery Sector rule, HON, MON, and NSPS subpart VVb) and State regulations (*i.e.*, the Texas fugitive emissions rules[49] applicable to petrochemical processes). Also, the EPA conducted a general analysis in a 2011 equipment leaks study[50] to identify the latest developments in practices, processes, and control technologies for equipment leaks at chemical manufacturing facilities and petroleum refineries, and to estimate the impacts of applying those practices, processes, and control technologies to model facilities. We used this 2011 equipment leaks analysis as a reference for conducting the technology review for equipment leaks at PEPO facilities.

Our technology review for equipment leaks of HAP (*i.e.*, broader than the EtO emissions discussed in section IV.B.2.b of this preamble) did not find any new control technologies for equipment leak emissions to evaluate. However, we did identify developments in LDAR practices and processes (*i.e.*, lower leak definitions) for valves in gas and vapor service or in light liquid service, and pumps in light liquid service. We evaluated three control options to reduce HAP emissions from equipment leaks: (Control Option 1) lowering the leak definition for valves in light liquid service from 500 ppmv to 100 ppmv, (Control Option 2) same as Control Option 1, plus lowering the leak definition for valves in gas and vapor service from 500 ppmv to

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[49] 30 TAC 115, subchapters D and H, Division 3.

[50] Hancy. 2011. Memorandum from Hancy, C., RTI International, to Howard, J., EPA/OAQPS. *Analysis of Emissions Reduction Techniques for Equipment Leaks*. December 21, 2011. EPA Docket ID No. EPA-HQ-OAR-2010-0869.

100 ppmv, and (Control Option 3) same as Control Option 2, plus lowering the leak definition for pumps in light liquid service from 1,000 ppmv to 500 ppmv. For all other component and service types, we did not identify developments in LDAR practices and processes in the chemical sector.[51]

The EPA estimated emission reductions for the developments that we identified using component counts and emission factors. We derived the component counts using data provided to the EPA in response to our CAA section 114 request (see section II.C of this preamble) and we developed model component counts for 25 PEPO facilities. We then multiplied the number of nationwide PEPO processes[52] by the model component counts to estimate the nationwide component counts. Subsequently, we calculated baseline emissions and emissions after implementation of the proposed controls for each component using these nationwide component counts and emission factors and leak frequencies for the chemical manufacturing industry obtained from the 2011 equipment leaks study.

The EPA then calculated the costs for the baseline and control options, which reflect the cost to implement an LDAR program for each component. Note that the difference between the costs for the baseline and control options is the incremental cost to comply with the control requirements. Furthermore, because the control options result in chemicals in process lines not leaking (*i.e.*, not being lost), we present costs both with and without this consideration. To estimate savings in chemicals not being emitted (*i.e.*, lost) due to the equipment leak control options, we applied a recovery credit of $900 per ton of VOC to the emission reductions in the analyses.

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[51] We note that while other technologies such as optical gas imaging and sensor networks may be considered developments in monitoring for equipment leaks, the EPA did not evaluate those options further as we have insufficient information on how use of such monitoring technology compares to current EPA Method 21 practices for chemical sector sources.

[52] We used data provided to the EPA in response to our CAA section 114 request to estimate an average of two PMPUs per facility for the 16 PEPO facilities that did not receive the CAA section 114 request. Including the estimate for the 16 PEPO facilities that did not receive the CAA section 114 request with the 18 PMPUs that were reported in the CAA section 114 request, we estimate 50 PMPUs nationwide.

We calculated the VOC and HAP cost effectiveness by dividing the incremental annual costs by the emissions reductions. Table 11 of this preamble presents the nationwide costs and impacts for the suite of equipment leak control options considered for PEPO facilities. For details on the assumptions and methodologies used in this analysis, see the document titled *Clean Air Act Section 112(d)(6) Technology Review for Equipment Leaks Located in the PEPO Production Source Category that are Associated with Processes Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking.

Table 11. Nationwide Emissions Reductions and Cost Impacts of Control Options Considered for PEPO Equipment

Control Option	Total Capital Investment ($)	Total Annualized Costs w/o Credits ($/yr)	Total Annualized Costs w/Credits ($/yr)	Total HAP Emission Reductions (tpy)	Average HAP Cost Effectivenes s w/Credits ($/ton)	Average HAP Cost Effectivenes s w/o Credits ($/ton)	Average Incremental HAP Cost Effectivenes s w/Credits ($/ton)
1	42,300	11,700	9,200	2.20	4,200	5,300	-
2	72,700	18,800	15,300	2.99	5,100	6,300	7,700
3	99,000	28,100	24,200	3.29	7,400	8,500	30,500

Based on the costs and emission reductions for each of the options, we determined that Control Option 2 (which includes Control Option 1) is cost effective. Therefore, we are proposing, pursuant to CAA section 112(d)(6), to revise the PEPO NESHAP at 40 CFR 63.1434(a)(7) to use a leak definition of 100 ppmv for valves that are in either gas/vapor service or light liquid service. In this action, we are not proposing to revise the PEPO NESHAP to reflect the requirements of Control Option 3 pursuant to CAA section 112(d)(6), because we determined that Control Option 3 is not cost effective due to its high incremental HAP cost effectiveness (*i.e.*, $30,500/ton of HAP) from Control Option 2. We solicit comments on the proposed revisions to the equipment leak requirements for the PEPO NESHAP.

6. Standards for Fenceline Monitoring

Fenceline monitoring refers to the placement of monitors along the perimeter of a facility to measure pollutant concentrations. Coupled with requirements for root cause analysis and corrective action upon triggering an actionable level, this work practice standard is a

development in practices considered under CAA section 112(d)(6) for the purposes of managing fugitive emissions. The measurement of pollutant concentrations and comparison to concentrations estimated from mass emissions via dispersion modeling is used to verify emission estimates from a facility's emissions inventory. If concentrations at the fenceline are greater than expected, potential causes may include underreported or unknown emissions, leaking equipment, or other issues, usually related to ground-level fugitive emissions. Fenceline monitoring also provides information on the location of these potential emissions sources because it provides complete spatial coverage of a facility. Further, when used with a mitigation strategy, such as root cause analysis and corrective action upon exceedance of an action level, fenceline monitoring can be effective in reducing emissions and reducing the uncertainty associated with emissions estimation and characterization. Finally, public reporting of fenceline monitoring data provides public transparency and greater visibility, leading to more focus and effort in reducing emissions.

The EPA has successfully applied fenceline monitoring to the petroleum refineries source category as a technique to manage and reduce benzene emissions from fugitive emissions sources such as storage vessels, wastewater treatment systems, and leaking equipment. In 2015, the EPA promulgated the RTR for the petroleum refineries source category and required that refineries install and operate fenceline monitors following EPA Methods 325A/B to monitor benzene emissions. Additionally, the 2015 rule required that refineries conduct a root cause analysis to identify sources of high fenceline monitoring readings (*i.e.*, above an annual action level) and then develop a corrective action plan to address the sources and reduce emissions to a level that will bring fenceline monitoring concentrations below the action level.[53] To date, the

EPA has received fenceline monitoring data for more than 5 years.[54] These data show that petroleum refinery fenceline concentrations have dropped by an average of 30 percent since the inception of the monitoring program requirements and illustrate that fenceline monitoring is an effective tool in reducing emissions and preserving emission reductions on an ongoing basis for these sources.

Additionally, in 2024, the EPA promulgated amendments to the HON (40 CFR part 63, subpart G) and the P&R I NESHAP (40 CFR part 63, subpart U) that included work practice standards requiring owners and operators to conduct fenceline monitoring for any of six specific HAP (*i.e.*, benzene; 1,3-butadiene; ethylene dichloride; vinyl chloride; EtO; and chloroprene) if their affected source uses, produces, stores, or emits any of them, and conduct root cause analysis and corrective action upon exceeding annual average concentration action levels established for each HAP. The final HON and P&R I NESHAP amendments require owners and operators to conduct passive diffusive tube fenceline monitoring for benzene, 1,3-butadiene, chloroprene, and ethylene dichloride in accordance with EPA Methods 325A/B of 40 CFR part 63, appendix A, and to use canister sampling in accordance with EPA Method 327 of 40 CFR part 63, appendix A, for EtO and vinyl chloride.[55]

Given the similarities between PMPUs subject to the PEPO NESHAP and CMPU sources that are subject to the HON, we evaluated the application of fenceline monitoring at PEPO facilities as a development in practices, processes, and control technologies pursuant to CAA section 112(d)(6). Like some CMPUs, PMPUs can be a significant source of EtO emissions from ground-level or near ground level fugitive sources such as storage vessels, wastewater treatment

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[53] 40 CFR 63.658(f) through (h).

[54] Quarterly fenceline monitoring reports are available through the EPA's WebFIRE database at *https://cfpub.epa.gov/webfire/*. The EPA has also developed a dashboard to improve public access to this data. The dashboard is available at *https://awsedap.epa.gov/public/extensions/Fenceline_Monitoring/Fenceline_Monitoring.html?sheet=MonitoringDashboard*.

[55] In the same action (see 89 FR 42932, May 16, 2024), the EPA also finalized EPA Method 327 of 40 CFR part 63, appendix A, as a canister sampling and analysis method that provides procedures for measuring trace levels of targeted VOC (including organic HAP) in ambient air.

systems, and leaking equipment. On the other hand, we determined that PMPUs are not significant sources of emissions of benzene, 1,3-butadiene, chloroprene, ethylene dichloride, and vinyl chloride. In the risk modeling file, which uses data from the 2017 NEI,[56] we did not attribute any records of vinyl chloride or chloroprene emissions to PEPO processes, and only small amounts of 1,3-butadiene, benzene, and ethylene dichloride emissions are attributed to PEPO processes (none of these emissions is clearly from a PMPU). Any significant emissions of these HAP from PEPO facilities are attributed to non-source category emission sources from facilities that are subject to the HON fenceline monitoring requirements. Considering the available information, we conclude that, for the PEPO NESHAP, a fenceline monitoring requirement for EtO is appropriate, but a fenceline monitoring requirement for benzene, 1,3-butadiene, chloroprene, ethylene dichloride, and vinyl chloride would not lead to an appreciable reduction in emissions.

Based on this information, the EPA is proposing in this action to implement a fenceline monitoring program under CAA section 112(d)(6) to limit fugitive emissions of EtO. We are proposing at 40 CFR 63.1434(i), by reference to 40 CFR 63.184, to require fenceline monitoring at facilities in the PEPO Production source category that use, produce, store, or emit EtO. A brief summary of the proposed fenceline sampling requirements and our rationale for selecting the corrective action concentration levels are provided as follows. We solicit comments on the proposed standards for fenceline monitoring.

a. Developments in Monitoring Technology and Practices

In developing the fenceline monitoring requirements for the Petroleum Refinery NESHAP, the HON, and the P&R I NESHAP, the EPA identified two different methods for monitoring fugitive emissions: (1) passive diffusive tube monitoring networks, and (2) canister monitoring networks. Given the similarities between PMPUs subject to the PEPO NESHAP and

[56] See appendix 1 of the document titled *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule*, which is available in the docket for this rulemaking, for more details about development of the risk modeling file.

CMPU sources that are subject to the HON, and the extent of co-location between PEPO and HON facilities (15 of the 25 PEPO facilities are co-located with HON facilities), we considered these monitoring methods as developments in practices under CAA section 112(d)(6) for purposes of managing fugitive EtO emission sources at PEPO production facilities.

In the promulgated amendments to the HON, the EPA finalized a new EPA method (EPA Method 327 of 40 CFR part 63, appendix A) to monitor the concentration of EtO at facility fenceline locations. EPA Method 327 provides procedures for canister sampling and analysis for measuring trace levels of targeted VOC (including organic HAP) in air. The method draws upon the guidance in Method TO-15A[57] for canister sampling and further develops this guidance into a robust method specific to fenceline monitoring, defining required data quality objectives, and incorporating existing best practices into the method. EPA Method 327 collects ambient air samples using specially prepared and pre-cleaned evacuated stainless-steel canisters. For analysis, the method specifies procedures for concentrating the target VOC (*i.e.*, EtO) in a known volume of air drawn from the canister, desorbing the target VOC from the preconcentrator, and determining the concentration of the target VOC using a gas chromatograph–mass spectrometer (GC-MS). The EPA continues to investigate cost-effective monitoring methods and technologies that could offer improved sensitivity, improved time resolution, or increased time integration.

In this action, the EPA is proposing at 40 CFR 63.1434(i), by reference to 40 CFR 63.184(b)(2), to require fenceline monitoring of EtO concentrations for one 24-hour period every 5 days using canister sampling in accordance with EPA Method 327 of 40 CFR part 63, appendix A. This monitoring frequency is necessary to ensure that all onsite processes are monitored regularly while maintaining the cost effectiveness of implementing a canister monitoring network. A sampling frequency of every 5 days also ensures that the annual average concentration derived from the fenceline data are indicative of the actual average emissions from the site by reducing the possibility that sampling occurs only during emission spikes.

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[57] *https://www.epa.gov/sites/default/files/2019-12/documents/to-15a_vocs.pdf*.

Additionally, to accommodate continued advancements and improvements in monitoring technology, we are also proposing to amend the entry for 40 CFR 63.7(f) of table 1 to the PEPO NESHAP (applicability of the NESHAP general provisions) to clarify that an owner or operator can request to use another type of monitoring network to demonstrate compliance with the fenceline standards, provided they achieve adequate coverage and detection capabilities.

b. Siting, Design, and Sampling Requirements for Fenceline Monitors

The EPA is proposing at 40 CFR 63.1434(i), by reference to 40 CFR 63.184(b)(3), that owners or operators deploy monitors to measure fenceline concentrations of EtO at facilities subject to the PEPO NESHAP. A primary requirement for a fenceline monitoring system is that it provides adequate spatial coverage for determination of representative pollutant concentrations at the boundary of the facility. In an ideal scenario, owners or operators would place fenceline monitors so that any fugitive plume originating within the facility would have a high probability of intersecting one or more monitors, regardless of wind direction. Therefore, we are proposing that each facility would place eight canisters evenly spaced on the monitoring perimeter. The monitoring perimeter may be the facility fenceline or may be inside the facility fenceline, provided all sources of EtO are contained within the perimeter. The EPA is also proposing to require that facilities move the canister sampling locations with alternating sampling periods to ensure complete spatial coverage of the facility. For facilities with perimeters less than or equal to 5,000 meters, all eight sampling points would be monitored during each sampling period. For facilities with perimeters greater than 5,000 meters but less than or equal to 10,000 meters, 16 sampling points would be required; for facilities with perimeters greater than 10,000 meters, 24 sampling points would be required. For facilities with EtO emission sources that are not contained within one contiguous area, the EPA is proposing monitoring of these secondary areas as well, with the size of the secondary area dictating the number of canisters. While we recognize that EPA Method 325A contains an option for siting passive tubes by determining the geographic

center of the facility and spacing the tubes based on measured angles from the center point, the EPA is not providing a similar approach to simplify the siting of the canisters.

The EPA is proposing at 40 CFR 63.1434(i), by reference to 40 CFR 63.184(d), that for each 24-hour sampling period, the facility would determine a "delta c," calculated as the lowest sample value for EtO subtracted from the highest sample value for EtO. This approach subtracts the estimated contribution from background emissions that do not originate from the facility. The owner or operator would average the delta c for the most recent year of samples (73 sampling periods) to calculate an annual average delta c on a rolling basis (*i.e.*, calculate a new annual average delta c every 5 days using data from the most recent 73 sampling periods). The owner or operator would compare this rolling annual average delta c against the concentration action level for EtO.

c. Action Levels and Rationale

As mentioned earlier in this preamble, the EPA is proposing to require facilities subject to the PEPO NESHAP to take corrective action to reduce fugitive emissions if monitored fenceline concentrations exceed the concentration action level on a rolling annual average basis.[58]

Due to current limitations in method detection limits for EtO, we selected the proposed fenceline action level to be equal to three times the representative detection limit (RDL) for EtO, as this is the minimum concentration that can be measured with reasonable certainty. The RDL is based on the results of the best performing testing companies and laboratories using the most sensitive analytical procedures. The EPA used a multiplication factor of three to reduce the imprecision of the method until the imprecision in the sampling and analysis is similar to the precision of other EPA methods. For the 2024 final amendments to the HON and P&R I NESHAP, the EPA determined an EtO RDL of 0.07 $\mu g/m^3$, which resulted in an EtO action level of 0.2 $\mu g/m^3$. Therefore, in this action the EPA is similarly proposing at 40 CFR 63.1434(i), by

[58] Calculated every 5 days for EtO.

reference to 40 CFR 63.184(d)(3)(iv), an action level of 0.2 $\mu g/m^3$ for EtO. If the reported inventories are accurate, and considering the anticipated emissions reductions from controls we are proposing, our modeling of fenceline EtO concentrations indicates that all facilities should be able to meet the fenceline concentration action level. For further details of the analysis, see the document titled *Clean Air Act Section 112(d)(6) Technology Review for Fenceline Monitoring Located at Facilities with PEPO Production Processes Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking.

d. Non-Source Category Emissions

This proposed approach also considers the possibility that offsite sources could contribute to modeled concentrations at a facility's fenceline. Additionally, non-PEPO sources could be located within facility property boundaries that also contribute to monitor readings. In this proposal, we are allowing the subtraction of offsite interfering sources (as they are not within the control of the owner or operator) through site-specific monitoring plans, but we are not providing this option for onsite, non-source category emissions. We based the action level on facility-wide emissions; therefore, we considered these non-source category sources in its development. Applying the fenceline standard to the whole facility will also limit emissions of EtO from all sources and provide more certainty in decisions being made as to whether the entire facility emissions align with what is expected from the EPA's analysis. It will also provide assurance to fenceline communities that emission reductions are achieved and maintained. This is important in the chemical sector, where there could be numerous source categories that can be co-located within a larger facility and have common tank farms, wastewater systems, heat exchangers, APCDs, fuel gas systems, *etc.*, that may be assigned or apportioned to various source categories.

e. Corrective Action Requirements

The proposed fenceline monitoring provisions would require the initiation of root cause analysis upon the facility's annual average concentration exceeding the action level, as determined on a rolling average every sampling period. The root cause analysis is an assessment

conducted through a process of investigation to determine the primary underlying cause and other contributing causes of an exceedance of the action level. The proposed provisions at 40 CFR 63.1434(i), by reference to 40 CFR 63.184(e)(1), would require an owner or operator to initiate a root cause analysis within 5 days of determining that an updated annual average concentration for EtO exceeds the action level. Owners or operators must conduct a root cause analysis following each sampling period in which the annual average EtO concentration remain above the action level, to determine whether the monitoring results and associated data indicate additional sources of emissions contributing to concentrations remaining above the action level. If the owner or operator cannot determine the root cause of the exceedance within 30 days of determining that there was an exceedance of an action level, the proposed revisions require use of real-time sampling techniques (*e.g.*, mobile gas chromatographs) to determine the root cause of the exceedance.

If the underlying causes of the action level exceedance are deemed to be from sources under the control of the owner or operator, we are proposing that the owner or operator take corrective action to address the underlying cause of the exceedance and to reduce concentrations below the action level as expeditiously as possible. We are proposing that owners or operators complete the root cause analysis and initial corrective action within 45 days after determining that there was an exceedance of the action level. If the owner or operator requires longer than 45 days to implement the corrective actions identified by the root cause analysis, the owner or operator would be required to submit a corrective action plan no later than 60 days after completion of the root cause analysis.

After completion of the initial corrective action, if the delta c for each of the next three sampling periods for samples collected by EPA Method 327[59] is below the action level, then the corrective action is assumed to have fixed the problem, and the owner and/or operator would

[59] The EPA is proposing that three sample periods must remain below the action level for samples taken by EPA Method 327 because this ensures that a sample will have been taken at every monitoring location at the site following the completion of the corrective action.

have no obligation for additional corrective action. However, if the delta c for any of the three subsequent sampling periods after initial corrective action is over the action level, then the owner or operator would have to submit a corrective action plan and schedule for implementing design, operation, and maintenance changes to eliminate as quickly as possible and prevent recurrence of the primary cause and other contributing causes to the exceedance of the action level, to reduce annual average concentrations below the action level. The proposed provisions would require the owner or operator to include the implementation of real-time sampling techniques to locate the primary and other contributing causes of the exceedance in the corrective action plan. While the action level is based on annual average concentrations, once the action level is exceeded, each sampling period that exceeds the action level contributes to the delta c remaining above the action level. Following these high biweekly periods, owners or operators must investigate to determine the root cause and, if appropriate, to correct the root cause expeditiously to reduce the annual average delta c below the action level.

f. Costs Associated With Fenceline Monitoring Requirements

Our cost estimate for implementing the same EtO fenceline monitoring work practice standard that is in the HON for the PEPO NESHAP follows the cost analysis already discussed in the document titled *Clean Air Act Section 112(d)(6) Technology Review for Fenceline Monitoring located in the SOCMI Source Category that are Associated with Processes Subject to HON and for Fenceline Monitoring that are Associated with Processes Subject to Group I Polymers and Resins NESHAP* (Docket Item No. EPA-HQ-OAR-2022-0730-0091). We estimated fenceline monitoring costs for eight canisters around the fenceline every 5 days. Table 12 of this preamble provides the estimated nationwide costs for fenceline monitoring as applied to facilities subject to the PEPO NESHAP. Note that 12 of the impacted facilities covered under the analysis have co-located sources subject to both the HON and the PEPO NESHAP and require EtO fenceline monitoring under both rules. For the purposes of this analysis, costs for these co-located facilities are included under the SOCMI source category for impacts to prevent costs being

double counted. For further information, see the document titled *Clean Air Act Section 112(d)(6) Technology Review for Fenceline Monitoring Located at Facilities with PEPO Production Processes Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking.

Table 12. Nationwide Cost Impacts of Fenceline Monitoring for the PEPO NESHAP

No. of Facilities Impacted	Monitoring Description	Total Capital Investment ($)	Total Annualized Costs ($/yr)
10	Canisters only	88,720	4,453,600

g. Additional Requirements of the Fenceline Monitoring Program

The EPA is proposing, by reference to the HON at 40 CFR 63.182(e), that owners or operators report fenceline data on a quarterly basis. Each report would contain the results for each sample where the field portion of sampling is completed by the end of the quarter, as well as for associated field and method blanks (*i.e.*, each report would contain data for at 18 canister sampling periods). Owners or operators would report these data electronically to the EPA within 45 days after the end of each quarterly period. See section IV.E.2 of this preamble for further discussion on electronic reporting and section IV.F of this preamble for further discussion on the compliance dates we are proposing.

D. What actions are we taking pursuant to CAA sections 112(d)(2) and (3) and 112(h)?

In addition to the proposed actions discussed in section IV.B of this preamble to reduce risk from EtO emission sources (from PEPO processes) and our proposed actions discussed in section IV.C of this preamble based on our on technology review, we are proposing other requirements for the PEPO NESHAP, based on analyses performed pursuant to CAA sections 112(d)(2) and (3) and 112(h).[60] [61] We are proposing to: (1) add new monitoring and operational requirements for flares used to reduce emissions from PEPO production processes, (2) clarify

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[60] The EPA has authority under CAA section 112(d)(2) and (3) to set MACT standards for previously unregulated emission points. The EPA also retains the discretion to revise a MACT standard under the authority of CAA section 112(d)(2) and (3) (see *Portland Cement Ass'n v. EPA*, 665 F.3d 177, 189 (D.C. Cir. 2011)), such as when it identifies an error in the original standard. See also *Medical Waste Inst. v. EPA*, 645 F.3d 420, 426 (D.C. Cir. 2011) (upholding the EPA action establishing MACT floors, based on post-compliance data, when originally-established floors were improperly established).

[61] The PEPO NESHAP requires that emission limits apply at all times (see 40 CFR 63.1420(h)).

regulatory provisions for vent control bypasses for closed vent systems containing bypass lines, (3) add work practice standards for startup and shutdown periods for maintenance vents and planned routine maintenance of storage vessels, (4) add new monitoring requirements for PEPO pressure vessels, (5) add new emission standards for PEPO surge control vessels and bottoms receivers, (6) add new emission standards for PEPO transfer operations, (7) add butylene oxide to the list of HAP presented in table 4 to subpart PPP, and (8) remove the 40 CFR 63.1420(d)(3) exemption for certain processes currently excluded from the affected source. See the following subsections for specific details regarding these proposed actions.

1. Flares

The EPA is proposing under CAA section 112(d)(2) and (3) to amend the operating and monitoring requirements for flares, which are commonly used as APCDs in the PEPO Production source category, because we have determined that the current requirements for flares are not adequate to ensure the level of destruction efficiency needed to comply with the process vent, storage vessel, wastewater stream, and equipment leak MACT standards in the PEPO NESHAP. The requirements applicable to flares, which are used to control emissions from various emission sources, are set forth in the general provisions of 40 CFR part 63 and are cross-referenced in the PEPO NESHAP.

The general provisions of 40 CFR 63.11(b) specify that flares be: (1) steam-assisted, air-assisted, or non-assisted; (2) operated at all times when emissions may be vented to them; (3) designed for and operated with no visible emissions (except for periods not to exceed a total of 5 minutes during any 2 consecutive hours); and (4) operated with the presence of a pilot flame at all times. These general provisions also specify both the minimum heat content of gas combusted in the flare and the maximum exit velocity at the flare tip. The general provisions specify monitoring for the presence of the pilot flame and the operation of a flare with no visible emissions.

In general, flares used as APCDs are expected to achieve 98-percent HAP destruction efficiencies when designed and operated according to the requirements in the general provisions. Studies on flare performance,[62] however, indicate that these general provision requirements are inadequate to ensure proper performance of flares at refineries and other petrochemical facilities, particularly when the flares are either steam- or air-assisted. In addition, over the last decade, flare minimization efforts at these facilities have led to an increasing number of flares operating at well below their design capacity, and while these efforts have resulted in reduced flaring of gases, situations of over-assisting with either steam or air have become exacerbated, leading to the degradation of flare combustion efficiency. Many PEPO facilities operate directly downstream from refineries and other petrochemical plants (*e.g.*, ethylene and EtO production plants) and, consequently, they likely flare waste gas constituents that are similar to those of a refinery or petrochemical plant. Given that the flare dataset that formed the underlying basis of the new standards for refinery flares also included flares at petrochemical plants, we are proposing at 40 CFR 63.1426(a) and (e)(2)(i), 63.1429(a)(8), 63.1430(b)(1), and 63.1437(c), each by reference to proposed 40 CFR 63.1436, to apply the finalized suite of operational and monitoring requirements for refinery flares[63] to those flares in the PEPO Production source category that control emissions from PEPO processes. Therefore, these proposed amendments at 40 CFR 63.1436 will ensure that continuous compliance with the CAA section 112(d)(2) and (3) standards is achieved for PEPO facilities that use flares as APCDs to meet the MACT standards at all times when controlling HAP emissions. We are also proposing to revise the entry for 40 CFR 63.11 of table 1 to the PEPO NESHAP to show that the provisions at 40 CFR 63.11(b) do not apply to flares because we are proposing to replace these provisions with new standards for flares used to comply with the MACT standards in the PEPO NESHAP.

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[62] For a list of studies, refer to the technical report titled *Parameters for Properly Designed and Operated Flares*, in Docket Item No. EPA-HQ-OAR-2010-0682-0191.

[63] See 40 CFR 63.670 and 63.671 (originally finalized in 80 FR 75178 on December 1, 2015; and amended at 81 FR 45232 on July 13, 2016, 83 FR 60696 on November 26, 2018, 85 FR 6064 on February 4, 2020, and 89 FR 23860 on April 4, 2024).

In 2012, the EPA compiled information and test data collected on flares and summarized its preliminary findings on operating parameters that affect flare combustion efficiency in a technical report titled *Parameters for Properly Designed and Operated Flares*, available in Docket Item No. EPA-HQ-OAR-2010-0682-0191.[64] The EPA submitted this report, along with a charge statement and a set of charge questions, to an external peer review panel.[65] The panel, consisting of individuals representing a variety of backgrounds and perspectives (*i.e.*, industry, academia, environmental experts, and industrial flare consultants), concurred with the EPA's assessment that the following three primary factors affect flare performance: (1) the flow of the vent gas to the flare; (2) the amount of assist media (*e.g.*, steam or air) added to the flare; and (3) the combustibility of the vent gas/assist media mixture in the combustion zone (*i.e.*, the net heating value, lower flammability, and/or combustibles concentration) at the flare tip. In response to peer review comments, the EPA performed a validation and usability analysis on all available test data as well as a failure analysis on potential parameters discussed in the technical report as indicators of flare performance. The document titled *Peer Review of Parameters for Properly Designed and Operated Flares*, which is available in Docket Item No. EPA-HQ-OAR-2010-0682-0193, contains the peer review comments, and we have incorporated that document into the docket for this rulemaking. These analyses resulted in a change to the population of test data that the EPA evaluated, and they helped form the basis for the flare operating limits promulgated in the 2015 Petroleum Refinery Sector final rule at 40 CFR part 63, subpart CC (80 FR 75178).[66] In this action, we are also relying on the flare analyses discussed earlier in this

[64] See section II.D. of this preamble, which addresses the incorporation by reference of certain docket files such as this one into the docket for this rulemaking.

[65] These documents can be found at *https://www.epa.gov/stationary-sources-air-pollution/review-peer-review-parameters-properly-designed-and-operated-flares*.

[66] See the document titled *Flare Performance Data: Summary of Peer Review Comments and Additional Data Analysis for Steam-Assisted Flares* in Docket Item No. EPA-HQ-OAR-2010-0682-0200 for a more detailed discussion of the data quality and analysis; the document titled *Petroleum Refinery Sector Rule: Operating Limits for Flares* in Docket Item No. EPA-HQ-OAR-2010-0682-0206 for a more detailed discussion of the failure analysis, and the document titled *Flare Control Option Impacts for Final Refinery Sector Rule* in Docket Item No. EPA-HQ-OAR-2010-0682-0748 for additional analyses on flare performance standards based on public comments received on the proposed Petroleum Refinery Sector rule.

preamble and proposing to apply the operating limits contained in the final rule for petroleum refineries to the flares used as APCDs in the PEPO Production source category (hereafter referred to as "PEPO flares"). The Agency believes, given the results from the various data analyses conducted for the Petroleum Refinery Sector rule, that the operating limits promulgated for flares used in the petroleum refinery sector are also appropriate and reasonable for PEPO flares to ensure that these flares meet the HAP destruction and removal efficiency at all times, consistent with the MACT standards established in the PEPO NESHAP in 1999 (64 FR 29420). Therefore, we are proposing at 40 CFR 63.1436 to replace all flare requirements throughout the PEPO NESHAP[67] with the Petroleum Refinery Sector rule flare definitions and requirements in 40 CFR part 63, subpart CC, with certain clarifications and exemptions discussed in this section of the preamble, including, but not limited to, specifying that several definitions in 40 CFR part 63, subpart CC, that apply to petroleum refinery flares also apply to flares in the PEPO Production source category, adding a definition and requirements for pressure-assisted multi-point flares, and specifying additional requirements for when an owner or operator uses a gas chromatograph or mass spectrometer for compositional analysis.

The remainder of this section of the preamble includes a discussion of requirements that we are proposing for PEPO flares, along with impacts and costs associated with these proposed revisions. Specifically, this action proposes to require that PEPO flares operate pilot flame systems continuously and that flares operate with no visible emissions (except for periods not to exceed a total of 5 minutes during any 2 consecutive hours) when the flare vent gas flow rate is below the smokeless capacity of the flare. In addition, this action proposes to consolidate measures related to flare tip velocity and proposes new operational and monitoring requirements related to the combustion zone gas. Further, this action proposes a work practice standard related to the visible emissions during periods when the flare is operated above its smokeless capacity (*e.g.*, periods of emergency flaring). Currently, the MACT standards in the PEPO NESHAP

[67] Refer to proposed 40 CFR 63.1436(a)(1) through (25) for a list of provisions that would no longer apply.

cross-reference the general provisions at 40 CFR 63.11(b) for the operational requirements for flares used as APCD. This proposal eliminates cross-references to the general provisions and instead specifies all new operational and monitoring requirements that are intended to apply to flares used as APCDs in the PEPO NESHAP.

a. Pilot Flames

The PEPO NESHAP references the flare requirements in 40 CFR 63.11(b), which specify that a flare used as an APCD should operate with a pilot flame present at all times. The provisions at 40 CFR 63.1429(a)(2) also require a device (including but not limited to a thermocouple, ultraviolet beam sensor, or infrared sensor) capable of continuously detecting the presence of a pilot flame. Pilot flames are proven to improve flare flame stability, and even short durations of an extinguished flame could cause a significant reduction in flare destruction efficiency. In this proposal, we are proposing to remove the cross-reference to the general provisions for PEPO flares and the requirement at 40 CFR 63.1429(a)(2), and instead cross-reference 40 CFR part 63, subpart CC, to include in the PEPO NESHAP the existing provisions requiring that flares operate with a pilot flame at all times and that owners or operators continuously monitor for a pilot flame using a thermocouple or any other equivalent device. We are also proposing to add a continuous compliance provision that would consider each 15-minute block where there is at least 1 minute without a pilot flame present when regulated material is routed to the flare as a violation of the standard. Refer to 40 CFR 63.1436 and 63.670(b) and (g) for these proposed requirements. See section IV.D.1.e of this preamble for our rationale for proposing to use a 15-minute block averaging period for determining continuous compliance. We solicit comments on the proposed revisions for flare pilot flames.

b. Visible Emissions

The PEPO NESHAP references 40 CFR 63.11(b), which specifies that a flare used as an APCD should operate with visible emissions for no more than 5 minutes in a 2-hour period. Owners or operators of these flares are required to conduct an initial performance demonstration

for visible emissions using EPA Method 22 of appendix A-7 to 40 CFR part 60. We are proposing to remove the cross-reference to the general provisions for PEPO flares and instead cross-reference 40 CFR part 63, subpart CC, to include this same limitation on visible emissions. We are also proposing to clarify that owners or operators should conduct an initial 2-hour visible emissions demonstration the first time that regulated materials are routed to the flare.

With regard to continuous compliance with the visible emissions limitation, we are proposing daily visible emissions monitoring for PEPO flares whenever regulated material is routed to the flare and also visible emissions monitoring whenever owners or operators observe visible emissions from the flare. On days that the flare receives regulated material, we are proposing that owners or operators of PEPO flares monitor visible emissions at a minimum of once per day while the flare is receiving regulated material using an observation period of 5 minutes and EPA Method 22. Additionally, whenever regulated material is routed to a flare and there are visual emissions from the flare, we are proposing that owners or operators perform another 5-minute visible emissions observation using EPA Method 22, even if they have already performed the minimum required daily visible emission monitoring. For example, if an employee observes visible emissions, the owner or operator of the flare would perform a 5-minute EPA Method 22 observation to check for compliance upon initial observation or notification of such event. In addition, in lieu of daily visible emissions observations performed using EPA Method 22, we are proposing that owners and operators be allowed to use video surveillance cameras. We believe that video surveillance cameras would be at least as effective for the PEPO flares as the proposed daily 5-minute visible emissions observations using EPA Method 22.

We are also proposing to extend the observation period for a PEPO flare to 2 hours whenever visible emissions are observed for greater than 1 continuous minute during any of the 5-minute observation periods. Refer to 40 CFR 63.1436 and 63.670(c) and (h) for these proposed requirements. We acknowledge that operating a flare near the incipient smoke point (the point at which black smoke begins to form within the flame) results in good combustion at the flare tip;

however, smoking flares can contribute significantly to emissions of particulate matter that is 2.5 micrometers in diameter or smaller. Thus, while increasing the allowable period for visible emissions may be useful from an operational perspective, we do not believe the allowable period for visible emissions should be increased to more than 5 minutes in any 2-hour period. We solicit comments on the proposed allowable period for visible emissions from flares.

As discussed later in this section, we are proposing additional operational and monitoring requirements for PEPO flares that we expect will result in owners or operators of PMPUs installing equipment that can be used to fine-tune and control the amount of assist steam or air introduced at the flare tip, thereby maximizing the flare combustion efficiency. These monitoring and control systems will assist flare owners or operators in operating near the incipient smoke point without exceeding the visible emissions limit. While combustion efficiency may be highest at the incipient smoke point, it is not significantly higher than the combustion efficiency achieved by the proposed operating limits discussed in section IV.D.1.d of this preamble. As seen in the performance curves for flares, there is very limited improvement in flare performance beyond the performance achieved at the proposed operating limits (see document titled *Petroleum Refinery Sector Rule: Operating Limits for Flares*, available in Docket Item No. EPA-HQ-OAR-2010-0682-0206, which we have incorporated into the docket for this rulemaking). We solicit comments and data on appropriate periods of visible emissions that would encourage flare operation at the incipient smoke point.

In addition, we are proposing that the owner or operator establish the smokeless capacity of each PEPO flare based on design specification of the flare and that the visible emissions limitation only apply when the flare vent gas flow rate is below its smokeless capacity. We are proposing a work practice standard that applies during emergency releases when the flow to a flare exceeds the smokeless capacity of the flare, based on comments the EPA received on the proposed Petroleum Refinery Sector rule. Refer to 40 CFR 63.1436 and 63.670(o) for these proposed provisions. In the Petroleum Refinery Sector final rule, the EPA explained that

numerous comments on the proposal suggested that flares are not designed to meet the visible emissions requirements when operated beyond their smokeless capacity (80 FR 75178). According to commenters, flares are typically designed to operate in a smokeless manner at 20- to 30-percent of full hydraulic load. Thus, they claimed, flares have two different design capacities: (1) a "smokeless capacity" to handle normal operations and typical process variations, and (2) a "hydraulic load capacity" to handle very large volumes of gases discharged to the flare as a result of an emergency shutdown. According to commenters, these capacity considerations are inherent in all flare designs, and the issue of flares not meeting visible emissions requirements when beyond their smokeless capacity has not previously been an issue because flare operating limits did not apply during malfunction events.

For this proposed work practice standard, the NESHAP would require owners or operators to develop a flare management plan for PEPO flares that identifies procedures for limiting discharges to the flare as a result of process upsets or malfunctions that cause the flare to exceed its smokeless capacity. In addition, for any flare that exceeds both the smokeless design capacity and visible emissions limit, we are proposing that owners or operators conduct a specific root cause analysis and take corrective action to prevent the recurrence of a similarly caused event. We are proposing that if the root cause analysis indicates that the exceedance of the visible emissions limit is caused by operator error or poor maintenance, then the exceedance would be considered a violation of the work practice standard. We are also proposing that a second event that occurs within a rolling 3-year period from the same root cause on the same equipment would be considered a violation of the standard. Finally, we are proposing that a third visible emissions limit exceedance occurring from the same flare in a rolling 3-year period would be a violation of the work practice standard, regardless of the cause.

In several of the EPA's previous impact analyses (for petroleum refinery flares and ethylene production flares),[68] the EPA established the number of events in a given time period

[68] See EPA-HQ-OAR-2010-0682-0793, EPA-HQ-OAR-2010-0682-0794, and EPA-HQ-OAR-2017-0357-0017.

that would be the "backstop" (*i.e.*, a violation of the standard). In each of these analyses, the EPA evaluated four different timing alternatives (two events in 5 years; two events in 3 years; two events in 5 years; and three events in 3 years) based on the number of existing flares evaluated over a 20-year period, and ultimately concluded that three events in 3 years would be "achievable" for the average of the best performing flares. We see no reason why this would be any different for PEPO flares. Even if a best-performing flare "typically" only has one event every 7 years, the fact that these events are random by nature (unpredictable, not under the direct control of the owner or operator) makes it difficult to use a 5-year time span. Based on this analysis, three events in 3 years would appear to be "achievable" for the average of the best performing flares.

c. Flare Tip Velocity

This proposed action consolidates provisions related to flare tip velocity for PEPO flares. The PEPO NESHAP references the flare provisions in 40 CFR 63.11(b), which specify maximum flare tip velocities based on flare type (non-assisted, steam-assisted, or air-assisted) and the net heating value of the flare vent gas. Based on data provided to the EPA in response to our CAA section 114 request (see section II.C of this preamble), four of the nine flares that PEPO facilities reported using as APCDs are either steam- or air-assisted (see the document titled *Control Option Impacts for Flares in the PEPO Production Source Category that Control Emissions from Processes Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking). Maximum flare tip velocities are required to ensure that the flame does not "lift off" the flare (*i.e.*, a condition where a flame separates from the tip of the flare and there is space between the flare tip and the bottom of the flame), which could cause flame instability and/or potentially result in a portion of the flare gas being released without proper combustion. We are proposing to remove the cross-reference to the general provisions for PEPO flares and instead to cross-reference 40 CFR part 63, subpart CC, to consolidate the provisions for maximum flare tip velocity into the PEPO NESHAP as a single equation, irrespective of flare type (*i.e.*, steam-

assisted, air-assisted, or non-assisted). Refer to 40 CFR 63.1436 and 63.670(d), (i), and (k) for these proposed provisions.

Based on analysis conducted for the Petroleum Refinery Sector rule, the EPA identified test runs of air-assisted flares with high tip velocities that had high combustion efficiencies (see the document titled *Petroleum Refinery Sector Rule: Evaluation of Flare Tip Velocity Requirements* in Docket Item No. EPA-HQ-OAR-2010-0682-0212). These test runs exceeded the maximum flare tip velocity limits for air-assisted flares using the linear equation in 40 CFR 63.11(b)(8). When the EPA compared these test runs to the test runs for non-assisted and steam-assisted flares, we determined that air-assisted flares appeared to have the same operating envelope as the non-assisted and steam-assisted flares. Therefore, for air-assisted PEPO flares, we are proposing the use of the same equation that non-assisted and steam-assisted flares currently use to establish the flare tip velocity operating limit. We are also proposing that the owner or operator determine the flare tip velocity on a 15-minute block average basis. See section IV.D.1.e of this preamble for our rationale for proposing to use a 15-minute block averaging period for determining continuous compliance.

Finally, we are proposing to exclude the provision for the special flare tip velocity equation in the general provisions at 40 CFR 63.11(b)(6)(i)(A) for non-assisted PEPO flares used to control gases with hydrogen content greater than 8 percent. This equation, which was developed based on limited data from a chemical manufacturer, has very limited applicability for flares used as APCDs in the PEPO Production source category because it only provides an alternative for non-assisted flares that are used to control gases with large quantities of hydrogen. Available data indicates that there are 18 flares in the PEPO Production source category; approximately 45 percent of these flares are either steam-assisted or air-assisted and 55 percent are non-assisted flares. Instead, we are proposing compliance alternatives that we believe provide a better way for PEPO flares combusting gases with high hydrogen content to comply with the rule while ensuring proper destruction performance of the flare (see section IV.D.1.d of this

preamble for the proposed compliance alternatives). Therefore, for non-assisted PEPO flares used as APCDs for gases with hydrogen content greater than 8 percent, we are proposing to exclude this special flare tip velocity equation as a compliance alternative. We request comment on the need to include this equation in the PEPO NESHAP.

d. Net Heating Value of the Combustion Zone Gas

The current provisions for flares in 40 CFR 63.11(b) specify that the flare vent gas meet a minimum net heating value of 200 British thermal units per standard cubic foot (Btu/scf) for non-assisted flares and 300 Btu/scf for air- and steam-assisted flares. The PEPO NESHAP references these provisions, but neither the general provisions nor the PEPO NESHAP includes specific requirements for monitoring the net heating value of the flare vent gas. Moreover, recent flare testing results indicate that meeting a minimum net heating value limit alone does not address instances when the flare may be over-assisted because it only considers the net heating value of the gas being combusted in the flare and does not consider other parameters (*e.g.*, absence of assist media). However, many industrial flares use steam or air as an assist medium to protect the flare tip, promote turbulence for the mixing, induce air into the flame, and operate with no visible emissions. Using excessive steam or air results in dilution and cooling of flared gases and can lead to operating a flare outside its stable flame envelope, reducing the destruction efficiency of the flare. In extreme cases, over-steaming or excess aeration can snuff out a flame and allow regulated material to be released into the atmosphere without complete combustion. As previously noted in section IV.D.1.c of this preamble, because available data indicate that about half of all PEPO flares are either steam- or air-assisted, it is critical that we ensure that the determination of flare combustion efficiency account for assist media in some form. Recent flare test data have shown that the best way to account for situations of over-assisting is to consider the gas mixture properties at the flare tip in the combustion zone when evaluating the ability to combust efficiently. As discussed in the introduction to this preamble section, the external peer review panel concurred with our assessment that the combustion zone properties at the flare tip

are critical parameters to know in determining whether a flare will achieve good combustion. The general provisions, however, solely rely on the net heating value of the flare vent gas, and we have determined that that information is not sufficient for determining flare combustion efficiency of PEPO flares.

In this proposal, in lieu of requiring compliance with the operating limits for net heating value of the flare vent gas specified in the general provisions, we are proposing to cross-reference 40 CFR part 63, subpart CC, to include in the PEPO NESHAP a single minimum operating limit for the net heating value in the combustion zone gas (NHVcz) of 270 Btu/scf during any 15-minute period for steam-assisted, air-assisted, and non-assisted PEPO flares. Refer to 40 CFR 63.1436 and 63.670(l) and (m) for these proposed provisions. The Agency believes, given the results from the various data analyses conducted for the Petroleum Refinery Sector rule, that this NHVcz operating limit promulgated for flares in the Petroleum Refinery Sector source category is also appropriate and reasonable and will ensure PEPO flares meet the HAP destruction efficiencies in the standard at all times when operated in concert with the other proposed flare provisions such as the pilot flame, visible emissions, and flare tip velocity requirements. See the documents titled *Petroleum Refinery Sector Rule: Operating Limits for Flares* and *Flare Control Option Impacts for Final Refinery Sector Rule* in Docket Item Nos. EPA-HQ-OAR-2010-0682-0206 and EPA-HQ-OAR-2010-0682-0748, respectively). In addition, we are proposing that owners or operators may use a corrected heat content of 1,212 Btu/scf for hydrogen, instead of 274 Btu/scf, to demonstrate compliance with the NHVcz operating limit for PEPO flares; however, owners or operators who intend to use the corrected hydrogen heat content must have a system capable of monitoring for the hydrogen content in the flare vent gas. The EPA determined the 1,212 Btu/scf value based on a comparison between the lower flammability limit and net heating value of hydrogen compared to light organic compounds and we have used this value in several consent decrees issued by the EPA. Based on analyses conducted for the Petroleum Refinery Sector rule (see the document titled *Flare Control Option*

Impacts for Final Refinery Sector in Docket Item No. EPA-HQ-OAR-2010-0682-0748), the EPA determined that using a 1,212 Btu/scf value for hydrogen greatly improves the correlation between combustion efficiency and the combustion zone net heating value over the entire array of data.

Furthermore, in addition to the NHVcz operating limit, we are proposing a net heating value dilution parameter (NHVdil) for certain PEPO flares that operate with perimeter assist air. Refer to 40 CFR 63.1436 and 63.670(f) and (n) for these proposed provisions. For air-assisted flares, use of too much perimeter assist air can lead to poor flare performance. Furthermore, based on our analysis of the air-assisted flare datasets (see the document titled *Petroleum Refinery Sector Rule: Operating Limits for Flares* in Docket Item No. EPA-HQ-OAR-2010-0682-0206), we determined that a NHVdil of 22 Btu/scf is necessary to ensure that there is enough combustible material available to adequately burn the gas and pass through the flammability region and also ensure that degradation of flare performance from excess aeration does not occur. We found that including the flow rate of perimeter assist air in the calculation of the NHVcz does not identify all instances of excess aeration and could (in some instances) even allow facilities to send very dilute vent gases to the flare that would not combust (*i.e.*, vent gases below their lower flammability limit could be sent to flare). Instead, the data suggest that the diameter of the flare tip, in concert with the amount of perimeter assist air (and other parameters used to determine NHVcz), provide the inputs necessary to calculate whether this type of flare is over-assisted. This dilution parameter is consistent with the combustion theory that the more time the gas spends in the flammability region above the flare tip, the more likely it will combust. Also, because both the volume of the combustion zone (represented by the diameter) and how quickly this gas is diluted to a point below the flammability region (represented by perimeter assist air flow rate) characterize this time duration, it is logical that we propose such a parameter.

We also found that some assist steam lines are purposely designed to entrain air into the lower or upper steam at the flare tip; and for flare tips with an effective tip diameter of 9 inches or more, there are no flare tip steam induction designs that can entrain enough assist air to cause a flare operator to have a deviation from the NHVdil operating limit without first deviating from the NHVcz operating limit. Therefore, we are proposing to allow owners or operators of PEPO flares that only use perimeter assist air entrained in lower and upper steam at the flare tip and that have a flare tip diameter of 9 inches or greater to comply only with the NHVcz operating limit. Steam-assisted flares with perimeter assist air and an effective tip diameter of less than 9 inches would remain subject to the requirement to account for the amount of assist air intentionally entrained within the calculation of NHVdil. However, we recognize that owners or operators cannot directly measure this assist air, but the quantity of air entrained is dependent on the assist steam rate and the design of the steam tube's air entrainment system. Therefore, we are proposing provisions to specify that owners or operators of these smaller diameter steam-assisted PEPO flares use the steam flow rate and the maximum design air-to-steam ratio of the steam tube's air entrainment system for determining the flow rate of this assist air. Using the maximum design ratio will tend to over-estimate the assist air flow rate, which is conservative with respect to ensuring compliance with the NHVdil operating limit.

Finally, we are proposing that owners or operators record and calculate 15-minute block average values for these parameters. Section IV.D.1.e of this preamble provides our rationale for selecting a 15-minute block averaging period. We solicit comments on the proposed revisions related to NHVcz.

e. Data Averaging Periods for Flare Gas Operating Limits

Except for the visible emissions operating limits described in section IV.D.1.b of this preamble, we are proposing to use a 15-minute block averaging period for each proposed flare operating parameter (*i.e.*, presence of a pilot flame, flare tip velocity, and NHVcz) to ensure that PEPO flares operate within the appropriate operating conditions. We consider a 15-minute

averaging time to be the most appropriate for assessing proper flare performance because flare vent gas flow rates and composition can change significantly over short periods of time. Furthermore, because destruction efficiency can fall precipitously when a flare is controlling vent gases below (or outside) the proposed operating limits, short time periods where the operating limits are not met could seriously decrease the overall performance of the flare. Refer to the Petroleum Refinery Sector rule preambles (79 FR 36880 and 80 FR 75178) for further details supporting why we believe a 15-minute averaging period is appropriate.

Given the short averaging times for the operating limits, we are proposing calculation methodologies to enable owners or operators to use "feed forward" calculations to ensure compliance with the operating limits on a 15-minute block average for PEPO flares. Specifically, we propose using the results of the compositional analysis determined just prior to a 15-minute block period for the next 15-minute block average. Owners or operators of PEPO flares will then know the vent gas properties for the upcoming 15-minute block period and can adjust assist gas flow rates relative to vent gas flow rates to comply with the proposed operating limits. In other words, "feed forward" means that owners or operators would use the net heating value in the vent gas (NHVvg) going into the flare in one 15-minute period to adjust the assist media (*i.e.*, steam or air) and/or the supplemental gas in the next 15-minute period, as necessary, to calculate an NHVcz limit of 270 Btu/scf or greater using the proposed equation. We recognize that when a subsequent measurement value is determined, the instantaneous NHVcz based on that compositional analysis and the flow rates that exist at the time may not be above 270 Btu/scf. We are proposing that this is not a violation of the operating limit. Rather, we are proposing that the owner or operator is only required to make operational adjustments based on that information to achieve, at a minimum, the net heating value limit for the subsequent 15-minute block average. We are, however, proposing that failure to adjust the assist media or supplemental natural gas using the NHVvg from the previous period in the equation provided for calculating an NHVcz limit of 270 Btu/scf would be a violation of the operating limit. Alternatively, because the owner

or operator could directly measure the NHVvg on a more frequent basis, such as with a calorimeter (and optional hydrogen analyzer), the process control system is able to adjust more quickly, and the owner or operator can adjust the assist media or supplemental natural gas more quickly. In this manner, the owner or operator is not limited by relying on NHVvg data that may not represent the current conditions. We are, therefore, also proposing that the owner or operator may opt to use the NHVvg in such instances from the same period to comply with the operating limit. For examples of "feed forward" calculations, see attachment 3 of the document titled *Flare Control Option Impacts for Final Refinery Sector Rule* in Docket Item No. EPA-HQ-OAR-2010-0682-0748.

We are also proposing to clarify that when determining compliance with the flare tip velocity and combustion zone operating limits specified in 40 CFR 63.670(d) and (e), the initial 15-minute block period starts with the 15-minute block that includes a full 15 minutes of the flaring event. In other words, we are proposing to clarify that the owner or operator demonstrate compliance with the velocity and NHVcz requirements starting with the block that contains the fifteenth minute of a flaring event; and the owner or operator is not required to demonstrate compliance for the previous 15-minute block in which the event started and contained only a fraction of flow. We solicit comments on these proposed revisions.

f. Flares in Dedicated Service

In lieu of the requirement that owners or operators continuously monitor the composition of the vent gas and the NHVvg, we are proposing an alternative monitoring approach for PEPO flares in dedicated service where the flare vent gas has consistent composition and flow. We believe that these flares do not need to have the same type of ongoing monitoring requirements as those with more variable waste streams. Thus, we are proposing an option that owners or operators can use to demonstrate compliance with the operating requirements for PEPO flares that are in dedicated service to a specific emission source, such as a transfer rack operation consistently loading the same material. We are proposing that owners or operators submit an

application to the Administrator to allow the use of this alternative compliance option. We are proposing that the application include a description of the system, characterization of the vent gases that could be routed to the flare based on a minimum of 7 grab samples (14 daily grab samples for continuously operated flares), and specification of the net heating value that will be used for all flaring events (based on the minimum net heating value of the grab samples). In other words, for PEPO flares that are in dedicated service, we are proposing that owners or operators could use the minimum NHVvg determined from the grab samples in the equation at 40 CFR 63.670(m)(1) for all flaring events to determine NHVcz. We are also proposing to allow engineering estimates to characterize the amount of gas flared and the amount of assist gas introduced into the system. For example, we believe that the use of fan curves to estimate air assist rates would be acceptable. We propose that flare owners or operators would use the net heating value determined from the initial sampling phase and measured or estimated flare vent gas and assist gas flow rates, if applicable, to demonstrate compliance with the standards. Refer to 40 CFR 63.1436 and 63.670(j)(6) for these proposed provisions. Finally, for owners and operators that must comply with the continuous monitoring requirements, we are proposing additional clarifications and requirements at 40 CFR 63.1436 when using a gas chromatograph or mass spectrometer for compositional analysis. We solicit comments on the proposed revisions related to flares in dedicated service.

g. Impacts of the Proposed Flare Operating and Monitoring Requirements

The EPA expects that the requirements for flares used as APCDs in the PEPO Production source category discussed in this section will affect all flares at PEPO processes. As previously mentioned, based on facility responses to our CAA section 114 request (see section II.C of this preamble), we estimate that there are 18 flares of traditional elevated flare tip designs (*e.g.*, steam-assisted, air-assisted, and non-assisted flare tips). The EPA estimated the costs for each flare for a given facility, considering current monitoring systems already installed on each individual flare. Given that the same type of equipment is used for flares in the PEPO Production

source category and for the petroleum refinery sector, we estimated the costs for any additional monitoring systems needed based on installed costs received from petroleum refineries and, if installed costs were unavailable, we based the cost estimates on vendor-purchased equipment. The EPA estimated the baseline emissions and the emission reductions achieved by the proposed rule based on current vent gas and steam flow data submitted by industry representatives. We note that the requirements for PEPO flares that we are proposing will ensure compliance with the MACT standards in the PEPO NESHAP when flares are used as an APCD. Because we are not changing the underlying MACT standards in the PEPO NESHAP, we did not include any of the estimated excess emissions from flares in the summary of total estimated emissions reductions for this action. However, we estimate that the proposed operational and monitoring requirements have the potential to reduce excess emissions from PEPO flares by approximately 75 tpy of HAP and 281 tpy of VOC (*i.e.*, non-methane, non-ethane total hydrocarbons). According to the emissions inventory file we used to assess residual risk (see section IV.C.1 of this preamble), there are 10 individual HAP compounds included in the emissions inventory for PEPO flares, including propylene oxide, EtO, toluene, glycol ethers, and hexane. For more detail on the impact estimates, see the document titled *Control Option Impacts for Flares in the PEPO Production Source Category that Control Emissions from Processes Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking.

2. Closed Vent System Containing Bypass Lines

For a closed vent system containing bypass lines that can divert the stream away from the APCD to the atmosphere, the PEPO NESHAP requires the owner or operator to either: (1) install, maintain, and operate a continuous parametric monitoring system for flow on the bypass line that is capable of detecting whether a vent stream flow is present at least once every 15 minutes, or (2) secure the bypass line valve in the non-diverting position with a car-seal or a lock-and-key type configuration. Under option 2, the PEPO NESHAP also requires owners or operators to inspect the seal or closure mechanism at least once per month to verify the valve is

maintained in the non-diverting position (see 40 CFR 63.1429(c)(2) for more details). To expressly prohibit bypassing an APCD at affected sources, as implied by option 2, we are proposing that an owner or operator may not bypass the APCD at any time and that a bypass is a violation (see proposed 40 CFR 63.1429(c)(3)), and owners and operators must estimate, maintain records, and report the quantity of organic HAP released (see proposed 40 CFR 63.1430(d)(6) and (h)(7)). These proposed requirements are also being proposed at 40 CFR 63.1425(f), by reference to 40 CFR 63.114(d)(2) and (3) and 63.118(a)(5) and (f)(7), for process vents in a PMPU that use THF to produce one or more PEPO products. We are proposing these revisions to ensure continuous compliance with the MACT standards, consistent with *Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008) (where the Court determined that standards under CAA section 112(d) must provide for compliance at all times), because bypassing an APCD could result in a release of regulated organic HAP to the atmosphere that would be required to be controlled under the existing MACT standards in the PEPO NESHAP. We are also proposing that the use of a cap, blind flange, plug, or second valve on open-ended valves or lines (following the requirements specified in 40 CFR 60.482-6(a)(2), (b), and (c) or following requirements codified in another regulation that are the same as 40 CFR 60.482-6(a)(2), (b), and (c)) is sufficient to prevent a bypass. We solicit comments on these proposed revisions.

3. Maintenance Activities

In the 2014 final rule (79 FR 17340, March 27, 2014), we removed the exemption from emissions standards for periods of SSM in accordance with a decision of the United States Court of Appeals for the District of Columbia Circuit, *Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008), *cert. denied*, 130 S. Ct. 1735 (U.S. 2010). This decision stated that the EPA must have standards in place at all times, even during periods of SSM. As a result, the process vent and storage vessel provisions (as well as other provisions) in the PEPO NESHAP apply at all times. Although the EPA eliminated the SSM exemption from the PEPO NESHAP in 2014, we recognize that owners or operators periodically discharge vent streams during certain

maintenance activities, such as those that require equipment openings, and we consider maintenance activities a separate class of startup and shutdown emissions because there must be a point in time when the equipment can be opened, and any remaining emissions vented to the atmosphere. We also acknowledge that it would require a significant effort to identify and characterize each of these potential release points (*e.g.*, for permitting purposes). Therefore, we are proposing to establish MACT standards for maintenance activities (*i.e.*, equipment openings, storage vessel degassing, and periods of planned routine maintenance of the emission control system for the vent on a fixed roof tank at a new or existing affected source). CAA section 112(h)(1) states that the Administrator may prescribe a work practice standard or other requirements, consistent with the provisions of CAA section 112(d) or (f), in those cases where, in the judgment of the Administrator, it is not feasible to enforce an emission standard. We are proposing work practices instead of numeric emission limits for maintenance activities because it is "not feasible to prescribe or enforce an emission standard" for these emissions. Emissions from maintenance activities are not "emitted through a conveyance designed and constructed to emit or capture such pollutant" (see CAA section 112(h)(2)(A)) and it is not possible to characterize each of these potential release points.

a. Equipment Openings (Excluding Storage Vessel Degassing)

To determine what MACT standards should be established for equipment openings, we reviewed State permit conditions and determined that the air emissions permits for the best performers specify that owners or operators meet certain conditions before they open equipment to the atmosphere. The conditions include thresholds regarding the lower explosive limit (LEL) and the amount of gas that may be emitted. Based on our review of these permits, we have determined that a work practice standard that allows opening process equipment to the atmosphere during maintenance events only after meeting certain conditions (as specified in this section IV.D.3.a of the preamble) represents the MACT floor level of control for equipment openings at new and existing affected sources. Therefore, we are proposing a work practice

standard at 40 CFR 63.1425(h)(1)(i) to specify that, prior to opening process equipment to the atmosphere during maintenance events, owners or operators must first drain the equipment before purging to a closed vent system so that the concentration of the vapor in the equipment served by the maintenance vent is less than or equal to 10 percent of the LEL. For those situations where owners or operators cannot demonstrate 10-percent LEL, we are proposing at 40 CFR 63.1425(h)(1)(ii) that owners or operators may open and vent the equipment to the atmosphere if the pressure is less than or equal to 5 pounds per square inch gauge (psig), provided that owners or operators do not actively purge the equipment to the atmosphere until meeting the LEL criterion. We are proposing this 5-psig threshold to acknowledge that a certain minimum pressure must exist for the flare header system (or other similar control system) to operate properly. We are also proposing at 40 CFR 63.1425(h)(1)(iii) that owners or operators can open equipment when the amount of VOC contained in the equipment is less than 50 pounds. These proposed work practice standards are also being proposed at 40 CFR 63.1425(f), by reference to 40 CFR 63.113(k), for maintenance vents in a PMPU that use THF to produce one or more PEPO products.

We acknowledge that installing a blind flange to prepare equipment for maintenance may be necessary and that by doing so, the owner or operator may not be able to meet the proposed maintenance vent conditions mentioned earlier in this section (*e.g.*, a valve used to isolate the equipment will not seat fully, so organic material may continually leak into the isolated equipment). To limit the emissions during the blind flange installation, we are proposing at 40 CFR 63.1425(h)(1)(iv) depressurizing the equipment to 2 psig or less prior to equipment opening and maintaining pressure of the equipment where purge gas enters the equipment at or below 2 psig during the blind flange installation. The low allowable pressure limit will reduce the amount of process gas released during the initial equipment opening, and the ongoing 2 psig pressure requirement will limit the purge gas rate. Together, these proposed provisions will limit the emissions during blind flange installation and will result in comparable emissions allowed under

the proposed maintenance vent conditions mentioned earlier in this section. We expect these situations to be rare and expect that the owner or operator would remedy the situation as soon as practical (*e.g.*, replace the isolation valve or valve seat during the next turnaround in the example provided earlier in this paragraph). Therefore, we are only proposing that owners or operators use this alternative maintenance vent limit under those situations where the proposed primary limits (*i.e.*, the concentration of the vapor in the equipment served by the maintenance vent is less than or equal to 10 percent of the LEL, pressure is less than or equal to 5 psig, or VOC is less than 50 pounds) are not achievable and blinding of the equipment is necessary. We did not identify any additional options beyond those identified here (*i.e.*, beyond-the-floor options) for controlling emissions from equipment openings.

To demonstrate compliance with the proposed equipment opening work practice standards, we are proposing at 40 CFR 63.1430(a) that owners and operators must keep standard site procedures used to deinventory equipment for safety purposes (*e.g.*, hot work or vessel entry procedures), as well the following additional records (as applicable):

- The concentration of the vapor at the time of the vessel opening exceeds 10 percent of its LEL, identification of the maintenance vent, the process units or equipment associated with the maintenance vent, the date of maintenance vent opening, and the concentration of the vapor at the time of the vessel opening;
- Either the vessel pressure at the time of the vessel opening exceeds 5 psig or the concentration of the vapor at the time of the active purging was initiated exceeds 10 percent of its LEL, identification of the maintenance vent, the process units or equipment associated with the maintenance vent, the date of maintenance vent opening, the pressure of the vessel or equipment at the time of discharge to the atmosphere and, if applicable, the concentration of the vapors in the equipment when active purging was initiated;

- Records of the estimating procedures used to determine the total quantity of VOC in the equipment and the type and size limits of equipment that contain less than 50 pounds of VOC at the time of maintenance vent opening;
- For each maintenance vent opening that contains greater than 50 pounds of VOC for which the deinventory procedures are not followed or for which the equipment opened exceeds the type and size limits established in the records, records that identify the maintenance vent, the process units or equipment associated with the maintenance vent, the date of maintenance vent opening, and records used to estimate the total quantity of VOC in the equipment at the time the maintenance vent was opened to the atmosphere; and
- Identification of the maintenance vent, the process units or equipment associated with the maintenance vent, records documenting actions taken to comply with other applicable alternatives and why utilization of this alternative was required, the date of maintenance vent opening, the equipment pressure and concentration of the vapors in the equipment at the time of discharge, an indication of whether active purging was performed and the pressure of the equipment during the installation or removal of the blind if active purging was used, the duration the maintenance vent was open during the blind installation or removal process, and records used to estimate the total quantity of VOC in the equipment at the time the maintenance vent was opened to the atmosphere for each applicable maintenance vent opening.

For any maintenance vent release exceeding the proposed applicable limits (*e.g.*, the maintenance vent release is greater than 10 percent of the LEL), we are proposing that the owner or operator include in the next periodic report: (1) identification of the maintenance vent and the equipment served by the maintenance vent; (2) the date and time the maintenance vent was opened to the atmosphere; (3) the LEL in percent, vessel pressure in psig, or mass in pounds of VOC in the equipment, as applicable, at the start of atmospheric venting, and if the 5 psig vessel

pressure option was used and active purging was initiated while the concentration of the vapor was 10 percent or greater of its LEL, also include the concentration of the vapors at the time active purging was initiated; and (4) an estimate of the mass in pounds of organic HAP released during the entire atmospheric venting event.

We solicit comments on the proposed revisions related to maintenance activities. For additional details and discussion, see the document titled *Review of Regulatory Alternatives for Certain Vent Streams in the PEPO Production Source Category that are Associated with Processes Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking.

b. Storage Vessel Degassing

The PEPO NESHAP does not currently contain a standard specific to storage vessel degassing when storage vessels are using control devices to comply with the requirements in 40 CFR 63.119(a)(2) (via reference by 40 CFR 63.1432). We acknowledge that storage vessel degassing is similar to maintenance vents (*e.g.*, equipment openings) and that there must be a point in time when the owner or operator can open the storage vessel and vent any remaining gas into the atmosphere. Therefore, to determine what MACT standards should be established for storage vessel degassing operations, we reviewed available data to determine how the best performers are controlling storage vessel degassing emissions.

We identified three regulations that address emissions from storage vessel degassing: two in Texas and one in California. The Texas Administrative Code[69] specifies degassing provisions and TCEQ implements those provisions through operating permit conditions.[70] In California, the South Coast Air Quality Management District (SCAQMD) specifies degassing requirements in their Rule 1149.[71]

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[69] See 30 Texas Administrative Code Chapter 115, Subchapter F, Division 3, available at *https://texreg.sos.state.tx.us/public/readtac%24ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=115&sch=F&div=3&rl=Y*.

[70] See *https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/mss/chem-mssdraftconditions.pdf*.

[71] *See http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1149.pdf*.

The Texas Administrative Code requirements are the least stringent and require control of degassing emissions until the vapor space concentration is less than 35,000 ppmv as methane or 50 percent of the LEL. The TCEQ permit conditions require control of degassing emissions until the vapor space concentration is less than 10 percent of the LEL or until the VOC concentration is less than 10,000 ppmv, and SCAQMD Rule 1149 requires control of degassing emissions until the vapor space concentration is less than 5,000 ppmv as methane. The EPA considers the TCEQ permit conditions to be equivalent to SCAQMD Rule 1149 control requirements because 5,000 ppmv as methane equals 10 percent of the LEL for methane.

Currently, 8 of the 25 existing PEPO facilities are located in Texas and subject to the TCEQ permit conditions; however, no PEPO facilities are located in California and subject to the SCAQMD rule. Therefore, the TCEQ permit conditions relying on storage vessel degassing until 10 percent of the LEL is achieved reflect what the best performers have implemented for storage vessel degassing.

We reviewed TCEQ operating permit condition 6 (applicable to floating roof storage vessels) and permit condition 7 (applicable to fixed roof storage vessels) for key information that we could implement to form the basis of a standard for storage vessel degassing. The TCEQ operating permit conditions require control of degassing emissions for floating roof and fixed roof storage vessels until the vapor space concentration is less than 10 percent of the LEL and the owner or operator has removed all the standing liquid from the vessel to the extent practicable. The permit conditions also specify that facilities have the option of degassing a storage vessel until reaching a VOC concentration of 10,000 ppmv.

We do not consider the 10,000 ppmv concentration cutoff option in the TCEQ permit conditions to be equivalent to or as stringent as the compliance option to meet 10 percent of the LEL. Therefore, we are not proposing the 10,000 ppmv concentration as a compliance option. We also do not expect that the best performers would use this concentration for compliance

because the TCEQ permit conditions allow facilities to calibrate their LEL monitor using methane.

Based on review of this information, we are proposing that the TCEQ requirements to reduce the vapor space concentration to less than 10 percent of the LEL and to remove all the standing liquid from the vessel to the extent practicable reflect the MACT floor for both new and existing PEPO sources. We did not identify any additional options beyond this (*i.e.*, beyond-the-floor options) for controlling emissions from storage vessel degassing. Therefore, we are proposing these requirements at 40 CFR 63.1432(a) by reference to 40 CFR 63.119(a)(6). However, because we recognize that in some cases (*e.g.*, use of an inert blanket) the storage vessel atmosphere would not have an LEL, the EPA is also proposing an organic HAP concentration cutoff of 5,000 ppmv (measured as methane) as an equivalent alternative to reducing the vapor space concentration to less than 10 percent of the LEL. These are considered equivalent because 5,000 ppmv as methane equals 10 percent of the LEL for methane.

Additionally, in petitions for reconsideration that the EPA recently received on the MON, EMACT standards, Petroleum Refinery Sector rule, and OLD NESHAP, petitioners asserted that it is necessary to make connections to a temporary control device to control the degassing emissions from floating roof storage vessels, which may require opening the storage vessel to make these connections. Therefore, we are proposing that owners or operators may open a floating roof storage vessel prior to degassing to set up equipment (*i.e.*, make connections to a temporary control device), but owners or operators must use this approach in a limited manner and must not actively purge the storage vessel while making connections.

We estimated the emissions reductions that would result from this proposed change to the PEPO NESHAP by evaluating the population of storage vessels that are subject to control under 40 CFR 63.119(a)(2) (by reference in 40 CFR 63.1432) and not located in Texas. Storage vessels regulated by the PEPO NESHAP in Texas are already subject to the degassing requirements; therefore, those PEPO facilities would not achieve additional emissions reductions. Additionally,

the PEPO facility that is owned by a small business also has processes subject to the HON, and the impacts of such degassing requirements on the facility were already accounted for under the recent HON rulemaking (see 89 FR 42932). Based on a review of facility responses to our CAA section 114 request (see section II.C of this preamble), owners or operators degas most storage vessels an average of once every 11 years. Using this average, and the population of PEPO storage vessels that are not in Texas (15 vessels) based on the assumption of one Group 1 storage vessel per non-Texas facility, we estimated that one storage vessel degassing event would be newly subject to control each year. Controlling PEPO storage vessel degassing would reduce HAP emissions by 0.87 tpy. See the document titled *Degassing Cost and Emissions Impacts for Storage Vessels Located in the PEPO Production Source Category that are Associated with Processes Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking, for details on the assumptions and methodologies used in this analysis.

c. Planned Routine Maintenance for Storage Vessel Control Devices

Although the PEPO NESHAP currently allows owners and operators to disconnect the fixed roof storage vessel vent from the closed vent system and control device, fuel gas system, or process equipment for up to 240 hours per year during planned, routine maintenance (see 40 CFR 63.119(e)(3) through (5) (by reference in 40 CFR 63.1432)), we are proposing at 40 CFR 64.1432(a) by reference to 40 CFR 63.119(e)(7) that owners and operators would not be allowed to fill the storage vessel during these periods (such that the vessel would emit HAP to the atmosphere for a limited amount of time due to breathing losses only). Our proposal is based on our review of other chemical sector NESHAP (HON, P&R I NESHAP, and Group II Polymers and Resins (P&R II) NESHAP (89 FR 42932, May 16, 2024)) where we have determined that a work practice standard that allows owners and operators up to 240 hours per year during planned routine maintenance of the emission control system, provided that there are no working losses from the vessel, represents the MACT floor level of control for fixed roof storage vessel vents at new and existing affected sources. We expect PEPO sources are using these same types of

practices to limit emissions, so we are proposing that this work practice represents the MACT floor level of control for fixed roof storage vessel vents at new and existing sources. However, if these processes are currently uncontrolled, the cost effectiveness of this work practice ($2,250 per ton of HAP reduced), minimal energy requirements, and limited non-air quality health and environmental impacts would likely result in the EPA establishing beyond-the-floor requirements based on the same practice. These proposed requirements ensure that a CAA section 112 standard is in place at all times, given that all working loss emissions from fixed roof storage vessels would be controlled during these periods of planned routine maintenance of the emission control system, thus satisfying *Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008).

We estimated the emissions reductions that would result from this proposed change to the PEPO NESHAP. We assumed that owners and operators would install a secondary control device system (to control emissions from vessels during periods of planned routine maintenance of the primary control device) and that owners and operators would choose activated carbon canisters as the method of control. Based on the facility responses to our CAA section 114 request (see section II.C of this preamble), we identified one facility that operates one Group 1 fixed roof storage vessel subject to controls according to table 3 to the PEPO NESHAP. We were also able to determine from an air permit review that another PEPO facility (*i.e.*, one that did not receive our CAA section 114 request) does not have any Group 1 storage vessels subject to controls according to table 3 to the PEPO NESHAP. Furthermore, we determined that one facility is a small business that is co-located with a HON facility, and already accounted for under the recent HON rulemaking (see 89 FR 42932). Using all of this information, we then extrapolated and estimated that the total number of Group 1 fixed roof storage vessels subject to the PEPO NESHAP nationwide is 15, assuming one vessel per facility. We then estimated that the highest amount of HAP emissions that would be expected to occur from a PEPO fixed roof storage vessel during the 240 hours of planned routine maintenance would be 262 pounds, if the emissions are not controlled. This emissions estimate includes 19.3 pounds of breathing losses

and 243 pounds of working losses. We based these emissions on the average vessel capacity and average vapor pressure material stored in a vessel reported (for all HON and PEPO fixed roof storage vessels) in response to our CAA section 114 request, and we estimated using the emission estimation procedures from chapter 7 of the EPA's Compilation of Air Pollutant Emission Factors.[72] We assumed that activated carbon canisters would achieve a 95 percent reduction in HAP emissions, which would reduce emissions per vessel by 230 pounds of HAP per year of working loss emissions.

As a beyond-the-floor control option, we considered requiring owners and operators to also control breathing losses from storage vessels during periods of planned routine maintenance of the emission control system. However, we concluded that this option would not be cost effective because we estimated it would cost $28,360 per ton of HAP reduced.

See the document titled *Cost and Emissions Impacts for 240-Hour Planned Routine Maintenance Work Practice Standard on Storage Vessels Located in the PEPO Production Source Category that are Associated with Processes Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking, for details on the assumptions and methodologies used in this analysis.

4. Pressure Vessels

We are proposing to establish separate MACT standards for pressure vessels that are associated with processes subject to the PEPO NESHAP. The rule does not currently regulate HAP emissions from pressure vessels. The EPA is proposing to define “pressure vessel” at 40 CFR 63.1423(a) (by reference to 40 CFR 63.101) to mean “a storage vessel that is used to store liquids or gases and is designed not to vent to the atmosphere as a result of compression of the vapor headspace in the pressure vessel during filling of the pressure vessel to its design capacity.” To eliminate any ambiguity in applicability or control requirements, the EPA is also

[72] *Compilation of Air Pollutant Emission Factors. Volume 1: Stationary Point and Area Sources*. AP-42, Fifth Edition. Chapter 7: Liquid Storage Tanks. OAQPS, Research Triangle Park, NC.

proposing at 40 CFR 63.1423(b) to remove the exemption for "pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere" from the definition of storage vessel. This longstanding exemption is ambiguous with respect to what "without emissions to the atmosphere" means. For example, most pressure vessels have relief devices that allow for venting when pressure exceeds setpoints. In many cases, these vents are routed to control devices; however, control devices are not completely effective (*e.g.*, they may achieve only 98-percent control), and therefore pressure vessels are sources of emissions to the atmosphere, even if they are controlled. There are also instances where other components in pressure systems may allow for fugitive releases because of leaks from fittings or cooling systems. All of these events arguably are "emissions to the atmosphere," and it is likely that even if the PEPO NESHAP maintained this exemption, owners and operators of pressure vessels would still have uncertainty regarding whether or not they were subject to substantive requirements. Therefore, the proposed revisions remove the ambiguity associated with the exemption and set new MACT standards intended to limit emissions to the atmosphere from pressure vessels at new and existing affected sources. We are also clarifying in the definition of PMPU at 40 CFR 63.1423(b) that the collection of equipment that is part of a PMPU includes pressure vessels.

We are proposing LDAR requirements at 40 CFR 63.1432(a) by reference to 40 CFR 63.119(a)(7) that are based on similar no-detectable emission requirements required for closed vent systems in most chemical sector NESHAP. These proposed requirements, which apply to each point on the pressure vessel through which total organic HAP could potentially be emitted,[73] are consistent with CAA section 112(d) controls and reflect the MACT floor at new and existing affected sources. We did not identify any additional options beyond this (*i.e.*,

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[73] Except for connectors in EtO service, gas/vapor or light liquid valves in EtO service, light liquid pumps in EtO service, and except for equipment that meet the unsafe-to-monitor or difficult-to-monitor criteria specified in 40 CFR 63.168(h) and (i) (for valves in gas/vapor service and in light liquid service) and in 40 CFR 63.174(f) and (h) (for connectors in gas/vapor service and in light liquid service).

beyond-the-floor options) for controlling emissions from pressure vessels. As such, these proposed requirements impose a standard that requires no detectable emissions at all times (*i.e.*, the proposed standard would require owners and operators to meet a leak definition of 500 ppmv at each point on the pressure vessel where total organic HAP could potentially be emitted); require initial and annual leak monitoring using EPA Method 21 of 40 CFR part 60, appendix A-7; and require routing organic HAP through a closed vent system to a control device (*i.e.*, no releases to the atmosphere through any points on the pressure vessel). These proposed LDAR requirements exclude connectors in EtO service, gas/vapor or light liquid valves in EtO service, and light liquid pumps in EtO service because those would be subject to more stringent LDAR requirements under the proposed EtO equipment leak standards.

We estimated the emissions reductions that would result from this proposed change to the PEPO NESHAP. Based on facility responses to our CAA section 114 request (see section II.C of this preamble) and an air permit review of PEPO facilities, we estimated that there are 15 pressure vessels located at PEPO facilities. Using information from a 2012 analysis that identified developments for storage vessels at chemical manufacturing facilities and petroleum refineries,[74] we estimate a total HAP emission reduction of 1.5 tpy for all affected pressure vessels associated with processes subject to the PEPO NESHAP. See the document titled *Cost and Emissions Impacts for Pressure Vessels Located in the PEPO Production Source Category that are Associated with Processes Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking, for details on the assumptions and methodologies used in this analysis. We solicit comments on the proposed revisions for pressure vessels.

5. Surge Control Vessels and Bottoms Receivers

The PEPO NESHAP, via reference to 40 CFR part 63, subpart H, defines a surge control vessel to mean feed drums, recycle drums, and intermediate vessels. PMPUs use surge control

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[74] Randall, 2012. Memorandum from Randall, D., RTI International, to Parsons, N., EPA/OAQPS. *Survey of Control Technology for Storage Vessels and Analysis of Impacts for Storage Vessel Control Options*. January 20, 2012. EPA Docket No. EPA-HQ-OAR-2010-0871.

vessels when in-process storage, mixing, or management of flow rates or volumes is needed to assist in manufacturing of a product. The PEPO NESHAP defines a bottoms receiver, via reference to 40 CFR part 63, subpart H, as a tank that collects distillation bottoms before the stream is sent to storage or for further downstream processing.

The PEPO NESHAP does not consider surge control vessels and bottoms receivers to be storage vessels because they are covered by the equipment leak provisions. Although these emissions sources are regulated under the equipment leak provisions (*i.e.*, 40 CFR 63.1434 by reference to NESHAP subpart H), the equipment leak requirements refer to the storage vessel requirements in NESHAP subpart G. Owners and operators of surge control vessels and bottoms receivers are required to comply with the HON storage vessel requirements in 40 CFR part 63, subpart G (*i.e.*, use a floating roof or route emissions to a closed vent system and control to achieve 95-percent control), provided the surge control vessel or bottoms receiver meets certain capacity and vapor pressure requirements. For PEPO surge control vessels and bottoms receivers at existing sources, storage vessel control requirements apply if the capacity is between 75 m^3 (inclusive) and 151 m^3 and the MTVP is greater than or equal to 13.1 kPa, or the capacity is greater than or equal to 151 m^3 and the MTVP is greater than or equal to 5.2 kPa. For PEPO surge control vessels and bottoms receivers at new sources, storage vessel control requirements apply if the capacity is between 38 m^3 (inclusive) and 151 m^3 and the MTVP is greater than or equal to 13.1 kPa, or the capacity is greater than or equal to 151 m^3 and the MTVP is greater than or equal to 0.7 kPa. The PEPO NESHAP excludes all other surge control vessels and bottoms receivers from emissions control requirements.

We are proposing at 40 CFR 63.1423(b) to remove surge control vessels and bottoms receivers from the list of equipment included in the definition of equipment leak, and we are proposing at 40 CFR 63.1434(a)(8) to require that owners and operators of all surge control vessels and bottoms receivers shall reduce emissions of organic HAP consistent with the process vent control requirements at 40 CFR 63.1425 through 63.1431, as applicable. The proposed

requirements for surge control vessels and bottoms receivers also represent the level of control found to be cost-effective for process vents under the technology review in section IV.C.3 of this preamble and, therefore, the level of control we are proposing for process vents. Emissions from surge control vessels and bottoms receivers are characteristic of process vents, not emissions from storage vessels. These vessels operate at process temperatures, rather than ambient storage temperatures; typically do not undergo level changes that larger storage vessels undergo; and are most often operated under pressure with and without intake or discharge of non-condensable gases. The size of these vessels is also typically not correlated with emissions, as are storage vessels. We solicit comments on the proposed revisions for surge control vessels and bottoms receivers.

6. Transfer Racks

We are proposing to establish MACT standards for transfer racks that are associated with processes subject to the PEPO NESHAP. The EPA considers transfer racks to be part of the collection of equipment that comprise a PMPU, as defined in the PEPO NESHAP; however, the rule does not currently regulate HAP emissions from transfer racks.

Because the equipment used in transfer racks at PEPO production facilities is similar to the equipment used at HON facilities, we are proposing to define a “transfer rack” based on a similar definition used in the HON (40 CFR 63.101). We are proposing to define “transfer rack” at 40 CFR 63.1423(b) to mean the collection of loading arms and loading hoses, at a single loading rack, that are assigned to a PMPU according to the procedures specified in 40 CFR 63.1420(f)(1) through (5) (where the term “transfer rack” is substituted for “storage vessel”) and are used to fill tank trucks and/or railcars with organic liquids that contain one or more organic HAP. A transfer rack also includes the associated pumps, meters, shutoff valves, relief valves, and other piping and valves. We are also proposing at 40 CFR 63.1423(a) (by reference to 40 CFR 63.101) to define a “loading rack” to mean “a single system used to fill tank trucks and railcars at a single geographic site. Loading equipment and operations that are physically

separate (*i.e.*, do not share common piping, valves, and other equipment) are considered to be separate loading racks." The HON definition of transfer rack explicitly excludes racks, arms, or hoses that only transfer liquids containing organic HAP as impurities or that use vapor balancing during all loading operations. We note that the PEPO NESHAP already provides these exclusions at 40 CFR 63.1420(c)(10) and (11).

Loading losses are the primary source of evaporative emissions from rail tank car or tank truck operations. Loading losses occur as the liquid entering the tank during loading displaces the organic vapors from the tank headspace into the atmosphere. These organic vapors are a combination of vapors: (1) formed in the empty tank by evaporation of residual product from previous loads, (2) transferred to the tank by vapor balance systems during product unloading, and (3) generated in the tank during loading of new product.

Based on data provided to the EPA in response to our CAA section 114 request (see section II.C of this preamble), we identified 17 transfer racks located at 6 of the 25 PEPO facilities.[75] We also identified another transfer rack at a seventh facility based on our review of the facility operating permit. One of the 25 PEPO facilities is a small business and is only subject to the PEPO NESHAP because it receives and treats wastewater from another PEPO facility; therefore, we do not expect this small business facility to have a transfer rack on site that would be associated with a PMPU. For the remaining 17 facilities, we used CAA section 114 request data to estimate averages of 2 PMPUs per facility and 1 transfer rack per PMPU. Based on these assumptions, we estimated that there are 34 transfer racks associated with the 17 facilities (17 facilities x 2 PMPUs/facility x 1 transfer rack/PMPU = 34 transfer racks). Therefore, we estimated a nationwide total of 52 transfer racks in the PEPO Production source category that are associated with processes subject to the PEPO NESHAP.

[75] As of March 1, 2024, there were 25 facilities that are major sources of HAP emissions in operation that are subject to the PEPO NESHAP. The list of facilities located in the United States that are part of the PEPO Production source category with processes subject to the PEPO NESHAP is presented in the document titled *List of Facilities Subject to the PEPO NESHAP*, which is available in the docket for this action.

We reviewed available data to determine how the best performers are controlling emissions from PEPO transfer racks. Given that 14 of the 25 PEPO facilities are located in either Louisiana or Texas, we evaluated the transfer rack provisions contained in the administrative code for these two States. The Texas provisions[76] for transfer racks provisions apply to materials containing VOC having a true vapor pressure greater than or equal to 0.5 pounds per square inch absolute (psia) (3.45 kPa) under actual storage conditions, and the Louisiana provisions[77] apply to materials containing VOC with a true vapor pressure of 1.5 psia (10.3 kPa) or greater at loading conditions. In each of these rules, owners and operators are required to use a vapor balance system or reduce emissions by 90 percent during loading operations (at a transfer rack). We also reviewed the transfer rack requirements in the HON because one PEPO facility said (in response to our CAA section 114 request) that they voluntarily comply with the HON for their PEPO transfer racks. The HON regulates transfer operations at 40 CFR 63.126 through 63.130. The HON requires owners and operators of each HON transfer rack that annually loads greater than or equal to 0.65 million liters of liquid products that contain organic HAP with a rack weighted average vapor pressure greater than or equal to 10.3 kPa to equip each transfer rack with a vapor collection system and control device to reduce total organic HAP emissions by 98 percent by weight or to an exit concentration of 20 ppmv. The HON also allows multiple other options to control emissions from applicable transfer racks, including use of a flare or collecting emissions for use in the process, a fuel gas system, or a vapor balance system.

For the purpose of addressing regulatory gaps, we are proposing in this action that the requirements to use a vapor balance system or reduce emissions by 90 percent during loading operations (at a transfer rack) are consistent with CAA section 112(d) controls and reflect the MACT floor for transfer racks at existing PEPO sources. We also propose that the transfer rack

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[76] See 30 Texas Administrative Code Chapter 115, Subchapter C, Division 1, available at *https://www.tceq.texas.gov/permitting/air/rules/state/115/r5211hp.html*.

[77] See Louisiana Administrative Code 33:III.2107, Chapter 21, available at *https://www.deq.louisiana.gov/resources/category/regulations-lac-title-33*.

requirements in the HON (*i.e.*, reduce emissions by 98 percent by weight or to an exit concentration of 20 ppmv during loading operations at a transfer rack) are consistent with CAA section 112(d) controls and reflect the MACT floor for transfer racks at new PEPO sources and beyond-the-floor control for transfer racks at existing PEPO sources.

We consider the vapor pressure applicability threshold in the Texas transfer rack provisions to be more stringent than the vapor pressure applicability thresholds contained in the HON and the Louisiana provisions. Therefore, we are proposing the vapor pressure applicability threshold specified in the Texas transfer rack provisions in addition to the HON transfer rack requirements. In summary, we are proposing at 40 CFR 63.1434(j), by reference to 40 CFR 63.126 through 63.130, that owners and operators of PEPO transfer racks that load materials with an MTVP greater than or equal to 0.5 psia (3.45 kPa) under actual storage conditions (*i.e.*, Group 1 transfer racks as defined in 40 CFR 63.1423(b)) must comply with the HON requirements at 40 CFR 63.126 through 63.130, if the material contains organic HAP as defined by 40 CFR 63.1423(b). To accommodate these proposed requirements, we are also proposing to remove the exemption of the terms "transfer" and "transferred" in the definition of "maximum true vapor pressure" at 40 CFR 63.1423(b). We anticipate that these proposed requirements achieve any additional emission reductions because we believe that transfer racks operating at PEPO sources load materials with very low true vapor pressures (*i.e.*, less than 0.3 psia based on data provided to the EPA in response to our CAA section 114 request) or are using vapor balancing as a control option. As a beyond-the-floor control option, we explored controlling the organic HAP emissions from PEPO transfer racks with add-on controls (*i.e.*, thermal oxidizers) and we determined that, although feasible, such add-on controls were unreasonably expensive, given that organic HAP emissions from PEPO transfer racks are expected to be small due to their low true vapor pressures (*e.g.*, all but one of the PEPO transfer racks in the modeling file are reported as each emitting less than about 380 pounds of organic HAP per year). Therefore, we concluded that the control of organic HAP using a thermal oxidizer would not be reasonable. For

example, the EPA estimated a cost of approximately $1,700,000 per ton of HAP emissions reduced for use of a thermal oxidizer. We solicit comments on the proposed standards for transfer racks.

7. Butylene Oxide

In this action, we are proposing to add butylene oxide (also known as 1,2-epoxybutane) to the definition of "epoxide" in 40 CFR 63.1423(b) and to the list of HAP presented in table 4 to the PEPO NESHAP. In a 1997 document supporting the establishment of the PEPO Production source category titled *Polyether Polyols Production Industry Characterization*, which is available in the docket for this action (Docket ID No. EPA-HQ-OAR-2023-0282), the EPA established two subcategories for the purpose of analyzing MACT floors and regulatory alternatives: (1) PEPO made from polymerization of epoxides (*i.e.*, EtO, propylene oxide, butylene oxide), and (2) PEPO made from the polymerization of THF. While the EPA recognized in this supporting documentation that butylene oxide is an epoxide used as a reactant to make PEPO, the EPA incorrectly stated that butylene oxide was not a HAP; therefore, the EPA did not include this compound in the epoxide definition or table 4 to subpart PPP.

Because most PEPO process units make a variety of products, including copolymers made from more than one type of epoxide, we have determined that any process unit using butylene oxide is likely to also use other epoxides (*i.e.*, EtO or propylene oxide); as such, gas streams from the process are already required to be monitored and controlled according to the PEPO NESHAP. For example, one facility reports EtO, propylene oxide, and 1,2-epoxybutane from the same PEPO reactor in the 2017 NEI. Therefore, we conclude that this proposed action will not result in the control of processes that are not already subject to the epoxide emissions standards specified in the PEPO NESHAP and that impacts will be minimal. We solicit comments on the proposed inclusion of butylene oxide.

8. 40 CFR 63.1420(d)(3) Exemption

The PEPO NESHAP (40 CFR 63.1420(d)(3)) exempts from the definition of affected source reactions or processing that occur after completion of epoxide polymerization and all catalyst removal steps, if any. In this action, the EPA is proposing at 40 CFR 63.1420(d)(4) to remove the exemption in 40 CFR 63.1420(d)(3) and to require capture and control of emissions from these currently unregulated steps in the PEPO production process (which may include, but are not limited to, solvent removal, purification, drying, and solids handling operations).

The reactions or processing that occur after completion of epoxide polymerization and catalyst removal steps are included in the PEPO Production source category. The EPA is proposing to expand the definition of the affected source because HAP emissions are possible from these steps[78] and are thus a regulatory gap that the EPA is required to address. Additionally, because the EPA concludes that the current MACT standards for process vents are appropriate for sources associated with reactions or processing that occur after completion of epoxide polymerization and catalyst removal steps, [79] the EPA is proposing that it is not necessary to evaluate alternative MACT limits for these currently unregulated steps beyond subjecting them to the previously established MACT limits for process vents. We solicit comments on the proposed removal of the exemption in 40 CFR 63.1420(d)(3).

E. What other actions are we proposing?

In addition to the proposed actions related to CAA sections 112(d)(2), (3), and (6), 112(h), and 112(f) discussed in sections IV.B through IV.D of this preamble, we are proposing to address selected issues raised in the petition for reconsideration (see section II.A.2 of this preamble). In addition, we are proposing changes to the PEPO NESHAP recordkeeping and reporting requirements to require the use of electronic reporting of certain reports, and we are

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[78] For example, a facility reports EtO emissions from a dryer and a solids handling system that are not considered part of the affected source subject to the PEPO NESHAP because they occur after epoxide polymerization and catalyst removal steps.

[79] For example, the facility reporting EtO emissions from a dryer and a solids handling system has used a flare to control emissions from the dryer and a baghouse to control emissions from the vent collection system associated with the solids handling system.

proposing other technical amendments and definition revisions to improve the clarity and enforceability of certain provisions in the PEPO NESHAP. Our rationale and proposed changes related to all these issues are discussed as follows.

1. Reconsideration Issues

The EPA discusses certain issues raised in the petition for reconsideration (see section II.A.2 of this preamble) related to affirmative defense and PRDs as described in this section IV.E.1 of the preamble.

a. Affirmative Defense

As part of the 2014 PEPO NESHAP RTR rulemaking (see 59 FR 17340, March 27, 2014), the EPA included the ability to assert an affirmative defense to civil penalties for violations caused by malfunctions (see 40 CFR 63.1420(i)) to create a system that incorporated some flexibility, recognizing that there is a tension inherent in many types of air regulations to ensure adequate compliance while simultaneously recognizing that, despite the most diligent of efforts, owners or operators may violate emission standards under circumstances entirely beyond the control of the source. Although the EPA recognized that its case-by-case enforcement discretion provides sufficient flexibility in these circumstances, we included the affirmative defense provision to provide a more formalized approach and more regulatory clarity. See *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1057–58 (D.C. Cir. 1978) (holding that an informal case-by-case enforcement discretion approach is adequate); but see *Marathon Oil Co. v. EPA*, 564 F.2d 1253, 1272–73 (9th Cir. 1977) (requiring a more formalized approach to consideration of "upsets beyond the control of the permit holder."). Under the EPA's regulatory affirmative defense provisions, if a source could demonstrate in a judicial or administrative proceeding that it had met the requirements of the affirmative defense in the regulation, civil penalties would not be assessed. However, the petitioners argued that the EPA should remove the affirmative defense provisions in the PEPO NESHAP because the court vacated the affirmative defense in one of the EPA's other CAA section 112 regulations. *NRDC v. EPA*, 749 F.3d 1055 (D.C. Cir. 2014)

(vacating affirmative defense provisions in the CAA section 112 rule establishing emission standards for Portland cement kilns). The court found that the EPA lacked authority to establish an affirmative defense for private civil suits and held that under the CAA, the authority to determine civil penalty amounts in such cases lies exclusively with the courts, not the EPA. Specifically, the court found: "As the language of the statute makes clear, the courts determine, on a case-by-case basis, whether civil penalties are 'appropriate.'" See *NRDC*, 749 F.3d at 1063 ("[U]nder this statute, deciding whether penalties are 'appropriate' in a given private civil suit is a job for the courts, not EPA.").[80]

In light of *NRDC* (and as requested by the petitioners), the EPA published a separate proposal (89 FR 52425, June 24, 2024) to remove regulatory affirmative defense provisions from three NSPS and 15 NESHAP (including the PEPO NESHAP). The public comment period for that proposal closed on August 8, 2024, and in this proposal, the EPA is not reopening the comment period or otherwise seeking additional public comments on this issue. The EPA will take separate final action on this issue, including responding to public comments submitted on the June 24, 2024, proposal. That final action will constitute the EPA's response to the petition for reconsideration on the affirmative defense provision promulgated in the 2014 final rule (79 FR 17340, March 27, 2014). Consequently, it is not necessary for the EPA to further address this issue in this proposed rulemaking.

b. PRDs

The petitioners stated that, although the PEPO NESHAP RTR proposal (77 FR 1268, January 9, 2012) required facilities to install electronic indicators and alarms to ensure compliance with the proposed prohibition of pressure releases to the atmosphere from PRDs in organic HAP service, the EPA made these types of equipment optional in the final rule (79 FR 17340, March 27, 2014), allowing sources to use "a device or system that is capable of

[80] The court's reasoning in *NRDC* focuses on civil judicial actions. The court noted that "EPA's ability to determine whether penalties should be assessed for CAA violations extends only to administrative penalties, not to civil penalties imposed by a court." *Id*.

identifying and recording the time and duration of each pressure release (*e.g.*, rupture disk indicators, magnetic sensors, motion detectors on the pressure relief valve stem, flow monitors, and pressure monitors) in lieu of prescribing that PRDs be equipped with release indicators and alarms." The petitioners contended that it was not feasible to comment on the EPA's change to allow other indicators of atmospheric releases from PRDs. Additionally, the petitioners argued that the EPA did not provide the public an opportunity to comment when it narrowed the applicability of the PRD release prohibition in the final rule to PRDs "in organic HAP service," and that, at a minimum, the EPA must narrow the applicability to only PRDs "in HAP service" to affect all HAP. Finally, the petitioners asserted that the EPA did not adequately justify giving PEPO facilities 3 years to comply with the PRD requirements in the PEPO NESHAP.

The PEPO NESHAP codifies the PRD requirements at 40 CFR 63.1434(c). We are not proposing to make any changes to the PRD requirements at 40 CFR 63.1434(c) as we believe the 2014 final rule (79 FR 17340, March 27, 2014) reached appropriate conclusions regarding each of these issues; however, we request comment on these requirements. We note that neither the proposed nor final rule was specific to a particular type of release indicator, and both the proposed and final rules anticipated use of a device capable of immediately notifying the facility of a release. Additionally, both the proposal and the final rule specified requirements for PRDs "in organic HAP service," and we disagree with the petitioners that we should expand the scope of the PRD requirements because the PEPO production process includes reacting organic chemicals together to make an organic chemical product. Also, we believe other changes we made to the PRD requirements between proposal and final were for clarification and were a reasonable outgrowth of public comments. Finally, we stated in the preamble to the final rule (see 79 FR 17345) that time to comply with the PRD requirements is needed for facilities to "research equipment and vendors, purchase, install, test and properly operate any necessary equipment." Even so, the petitioners' argument that the EPA did not adequately justify giving PEPO facilities 3 years to comply with the PRD requirements is no longer relevant, given that all

new and existing sources have been complying with the PRD requirements for over 7 years (*i.e.*, since March 27, 2017).

2. Electronic Reporting

As part of the 2014 PEPO NESHAP RTR rulemaking (see 59 FR 17340, March 27, 2014), the EPA began requiring owners or operators of PEPO facilities to submit electronic copies of certain required performance test reports. The proposed rule amendments in this action would require owners and operators of PEPO processes to submit electronic copies of required performance test reports using new procedures. In lieu of requiring owners and operators to submit the results of performance tests "by direct computer-to-computer electronic transfer via EPA-provided software" (see 40 CFR 63.1439(e)(9)(i)), we are proposing at 40 CFR 63.1426(b)(6) and 63.1439(e)(9)(iii) that owners and operators must submit the results of the performance test following the procedures specified in 40 CFR 63.9(k), which requires use of the EPA's Central Data Exchange (CDX) using the Compliance and Emissions Data Reporting Interface (CEDRI). The proposed rule amendments would also require owners or operators to submit flare management plans and periodic reports (including fenceline monitoring reports) through the EPA's CDX using CEDRI (see proposed 40 CFR 63.1436(b), 63.1439(e)(6), and 63.1434(i)). A description of the electronic data submission process is provided in the document titled *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.

The proposed rule would require that performance test results collected using test methods that are supported by the EPA's Electronic Reporting Tool (ERT) as listed on the ERT website[81] 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 XML schema on the ERT website, and other performance

[81] *https://www.epa.gov/electronic-reporting-air-emissions/electronic-reporting-tool-ert*.

test results be submitted in portable document format (PDF) using the attachment module of the ERT. Flare management plans would be uploaded as a PDF file.

For periodic reports (including fenceline monitoring reports), the proposed rule would require that owners and operators use an appropriate spreadsheet template to submit information to CEDRI. A draft version of the proposed templates for these reports is included in the docket for this action.[82] The EPA specifically requests comment on the content, layout, and overall design of the templates. We are proposing that owners and operators begin using the templates for periodic reports other than fenceline reports 3 years after the final rule is published in the *Federal Register*, or after the reporting template for the subpart has been available on the CEDRI website for 1 year, whichever date is later. Owners and operators would begin using the templates for fenceline monitoring reports starting when the first fenceline monitoring report is due.

Additionally, the EPA has identified two broad circumstances in which electronic reporting extensions may be provided. These circumstances are: (1) outages of the EPA's CDX or CEDRI which preclude an owner or operator from accessing the system and submitting required reports, and (2) force majeure events, which are defined as events that will be or have been caused by circumstances beyond the control of the affected facility, its contractors, or any entity controlled by the affected facility that prevent an owner or operator from complying with the requirement to submit a report electronically. Examples of force majeure events are acts of nature, acts of war or terrorism, or equipment failure or safety hazards beyond the control of the facility. The EPA is providing these potential extensions for submitting electronic copies of required performance test reports, flare management plans, and periodic reports (including fenceline monitoring reports) 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. In both circumstances, the decision to accept the claim of needing additional time

[82] See Part_63_Subpart_PPP_63.1439(e)(6)_Periodic_Report.xlsx, which is available in the docket for this action.

to report is within the discretion of the Administrator, and reporting should occur as soon as possible. These potential extensions were recently added to 40 CFR part 63, subpart A, General Provisions at 40 CFR 63.9(k) and we are proposing to amend the entry for 40 CFR 63.9(k) of table 1 to the PEPO NESHAP (Applicability of General Provisions to Subpart PPP Affected Sources) to remove the constraint that 40 CFR 63.9(k) applies "only as specified in Sec. 63.9(j)" such that 40 CFR 63.9(k) would apply for any notifications or reports required by the PEPO NESHAP to be submitted electronically.

The electronic submittal of the reports addressed in this proposed 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, and will ultimately reduce burden on regulated facilities, delegated air agencies, and the EPA.[83] 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[84] to implement Executive Order 13563 and is in keeping with the EPA's Agency-wide policy[85] developed in response to the White House's Digital Government Strategy.[86] For more information on the benefits of electronic reporting, see the document titled *Electronic Reporting Requirements for*

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[83] We are proposing at 40 CFR 63.1421(c)(5) that the approval to an alternative to any electronic reporting to the EPA proposed for the PEPO NESHAP cannot be delegated to State, local, or Tribal agencies.

[84] EPA's Final Plan for Periodic Retrospective Reviews, August 2011. Available at: *https://www.regulations.gov/document?D=EPA-HQ-OA-2011-0156-0154*.

[85] 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*.

[86] 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*.

New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) Rules, referenced earlier in this section.

3. Performance Testing

The EPA is proposing at 40 CFR 63.1437(a) performance testing once every 5 years to demonstrate compliance with emission limits for certain process vents (if you route emissions to a control device other than a flare). We determined that periodic emission testing should be required to help ensure continuous compliance. Repeat performance tests are already required by permitting authorities for some facilities. Further, requiring periodic repeat performance tests will help to ensure that control systems are properly maintained over time, thereby reducing the potential for acute emissions episodes. Currently, facilities conduct a one-time performance test or design evaluation and then monitor operating parameters. A design evaluation (in lieu of performance testing) is currently allowed for control techniques that receive less than 10 tpy of uncontrolled organic HAP emissions from one or more PMPU. However, we are proposing to remove the design evaluation option at 40 CFR 63.1426(b)(6) and (7) and (f), and require ongoing performance tests for owners and operators using a combustion, recovery, or recapture device to comply with an epoxide or organic HAP percent reduction efficiency requirement in 40 CFR 63.1425(b)(1)(i), (b)(2)(ii), (c)(1)(ii), (c)(3)(ii), or (d)(2); an epoxide concentration limitation in 40 CFR 63.1425(b)(1)(ii) or (b)(2)(iii); or an annual epoxide emission limitation in 40 CFR 63.1425(b)(1)(iii) or (b)(2)(iv). We are proposing that the ongoing performance tests be conducted at a minimum frequency of once every 5 years to supplement the parameter monitoring and to ensure that emission controls continue to operate as demonstrated during the initial performance test. Currently 40 CFR 63.1437(a) also requires the owner or operator to record the necessary process information to document operating conditions during the test. We are proposing to clarify that this includes an explanation to support that the operating conditions during each test represent the entire range of normal operation, including conditions for maximum emissions, even if such emissions are not expected during maximum production.

In addition, we are proposing to eliminate the option in 40 CFR 63.1427(a)(2)(ii) that exempts owners or operators using ECO as a control technique from directly measuring the concentration of unreacted epoxide when determining the batch cycle percent epoxide emission reduction. Currently, the rule requires comparing the epoxide concentration obtained through direct measurement for one product from each product class with the concentration determined using process knowledge, reaction kinetics, and engineering knowledge. Owners and operators are exempt at 40 CFR 63.1427(a)(2)(ii) from this direct measurement comparison if uncontrolled epoxide emissions before the end of the ECO are less than 10 tpy. However, we are proposing to remove this exemption and to require that owners and operators conduct the comparison of epoxide concentration using direct measurement for one product from each product class even if uncontrolled epoxide emissions before the end of the ECO are less than 10 tpy.

We solicit comments on the proposed revisions to the performance testing and ECO direct measurement requirements.

4. Certain Definitions That Refer to the HON

We note that in an effort to remove redundancy and improve consistency, the EPA recently finalized moving all of the definitions from NESHAP subparts G and H (*i.e.*, 40 CFR 63.111 and 40 CFR 63.161, respectively) into the definition section of NESHAP subpart F (*i.e.*, 40 CFR 63.101) (see 89 FR 42932, May 16, 2024). Given that the PEPO NESHAP directly references these provisions for certain definitions (see 40 CFR 63.1423), we are proposing to revise the phrasing used in 40 CFR 63.1423(a) to refer to NESHAP subpart F in instances where a definition in the PEPO NESHAP points to either NESHAP subpart G or H.

We are also proposing editorial changes that clarify references in the PEPO NESHAP definitions at 40 CFR 63.1423(b) to properly reference the correct HON citation for “continuous recorder,” “maximum true vapor pressure,” “residual,” and “waste management unit.”

We are proposing to delete “heat exchange system” from the list of terms in 40 CFR 63.1423(a) that refer to subpart F for their definition. We are proposing to define “heat exchange

system” at 40 CFR 63.1423(b) so the definition refers to PMPUs instead of CMPUs. We are proposing “heat exchange system” to mean a device or collection of devices used to transfer heat from process fluids to water without intentional direct contact of the process fluid with the water (*i.e.*, non-contact heat exchanger) and to transport and/or cool the water in a closed-loop recirculation system (cooling tower system) or a once-through system (*e.g.*, river or pond water). For closed-loop recirculation systems, the heat exchange system consists of a cooling tower, all PMPU heat exchangers that are in organic HAP service and serviced by that cooling tower, and all water lines to and from these process unit heat exchangers. For once-through systems, the heat exchange system consists of all heat exchangers that are in organic HAP service servicing an individual PMPU and all water lines to and from these heat exchangers. Sample coolers or pump seal coolers are not considered heat exchangers for the purpose of this definition and are not part of the heat exchange system. Intentional direct contact with process fluids results in the formation of a wastewater. We are also proposing to revise the definition of “in organic HAP service” to include a heat exchange system, to be consistent with the use of “in organic HAP service” in the definition of “heat exchange system.”

5. Monitoring for Adsorbers That Cannot Be Regenerated and Regenerative Adsorbers That Are Regenerated Offsite

We are proposing to add monitoring requirements at 40 CFR 63.1429(a)(9) for adsorbers that cannot be regenerated and regenerative adsorbers that are regenerated offsite because the PEPO NESHAP does not currently include specific monitoring requirements for this type of APCD and it is possible that owners and operators may use this type of APCD to control emissions from PEPO sources. We are proposing that owners and operators of this type of APCD use dual adsorbent beds in series. We are proposing to prescribe a dual-bed system because the use of a single bed does not ensure continuous compliance unless the bed is replaced

significantly before breakthrough.[87] The proposed monitoring requirements for non-regenerative adsorbers fulfill the EPA's obligation to establish monitoring requirements to ensure continuous compliance with the emission limits (*e.g.*, 98-percent control or a 20-ppmv TOC outlet concentration) when owners or operators are using these types of control devices to comply with the standards. A dual-bed system will allow one bed to be saturated before it is replaced and, therefore, makes efficient use of the adsorber bed without exceeding the emission limits.

Similar to regenerative adsorbers, to monitor performance deterioration, we are proposing measurements of HAP or TOC using a portable analyzer or chromatographic analysis for non-regenerative absorbers. We are proposing that owners or operators obtain these measurements at the outlet of the first adsorber bed in series using a sampling port, and that they obtain measurements monthly (if the bed has at least 2 months of the bed design life remaining), weekly (if the bed has between 2 months and 2 weeks of bed design life remaining), or daily (when the bed has less than 2 weeks of bed design life remaining). Also, we propose to require that owners and operators establish an average adsorber bed life from a design evaluation as well as conduct monitoring no later than 3 days after a bed is put into service as the first bed in series to confirm that it is functioning properly.

We did not identify any carbon adsorbers in the risk modeling file. To validate this finding, we conducted an air permit review alongside analysis of our CAA section 114 request data and confirmed that PEPO facilities do not currently use carbon adsorbers to control HAP emissions from PEPO sources. Therefore, we do not anticipate any cost associated with adding these proposed monitoring and operation requirements to the PEPO NESHAP for non-regenerative adsorbers and adsorbers with beds that are regenerated off-site. Additionally, the EPA acknowledges that these proposed requirements could be considered under CAA section 112(d)(6) because of the specification to have two adsorber beds in series, instead of as a

[87] We are proposing to define the term "breakthrough" at 40 CFR 63.1423(a) (by reference to 40 CFR 63.101) to mean the time when the level of HAP or TOC detected is at the highest concentration allowed to be discharged from an adsorber system.

proposed change to the monitoring requirements. However, our rationale for why a second bed is needed would not be any different if we described these proposed changes under CAA section 112(d)(6) instead of as a monitoring change. As previously mentioned, we are proposing these changes because the current PEPO NESHAP does not contain monitoring requirements for non-regenerative adsorbers, and it is possible that owners and operators may use this type of APCD to control emissions from PEPO sources.

6. Listing of 1-Bromopropane (1-BP) as a HAP

On January 5, 2022, the EPA published in the *Federal Register* (87 FR 393) a final rule amending the list of HAP under the CAA to add 1-bromopropane in response to public petitions previously granted by the EPA. For the PEPO Production source category, we conclude that the inclusion of 1-BP as an organic HAP will not have any effect on the MACT standards. First, 1-BP is not an epoxide, nor is it THF. Furthermore, we have no information showing that 1-BP is used, produced, or emitted to make or modify the PEPO product. Accordingly, we are proposing that no further action is required related to 1-BP. We solicit comments on this approach, and should new information submitted to the EPA show that 1-BP is emitted from this source category, the EPA will consider this information in the context of developing any MACT standards that may be needed to address emissions of 1-BP. We also note that in several instances in the PEPO NESHAP, facilities can comply with a TOC concentration standard (*e.g.*, 20 ppmv), which could adequately regulate emissions of 1-BP if it is emitted from this source category.

7. Other Editorial Changes

The EPA is proposing additional changes that address technical and editorial corrections for the PEPO NESHAP and overlap with the P&R I NESHAP as detailed here:

- The EPA is proposing to replace "elastomer" with "polyether polyol" in 40 CFR 63.1420(e)(3) to correct a typographical error, given that the PEPO NESHAP applies to PMPUs and does not use the term "elastomer" anywhere else in the rule.

- The EPA is proposing to delete "parts per million by volume" in 40 CFR 63.1425(f)(7)(iv) because "ppmv" is defined previously in the rule.
- The EPA is proposing at 40 CFR 63.1426(b)(4) and (5) to allow owners and operators of emission sources controlled by a boiler or process heater burning hazardous waste to comply with the provisions of 40 CFR part 63, subpart EEE, rather than complying with the performance test provisions in the PEPO NESHAP.
- The EPA is proposing to clarify at 40 CFR 63.1426(c)(2) that performance tests and compliance determinations must be conducted according to the schedule and procedures in 40 CFR 63.1437.
- The EPA is proposing to remove the exemption at 40 CFR 63.1426(d)(1) that allows owners and operators to be exempt from determining uncontrolled organic HAP emissions for process vents in a PMPU if all process vents subject to the emission reduction requirements of 40 CFR 63.1425(b), (c)(1), or (d)(2) are controlled at all times using a combustion, recovery, or recapture device, or ECO. Based on our review of historical documents, it is not clear why this exemption is needed. Instead, we are proposing that owners and operators must determine uncontrolled emissions for each process vent at a PMPU that is complying with the process vent control requirements in 40 CFR 63.1425(b)(1)(i), (b)(1)(iii), (b)(2)(ii), (b)(2)(iv), (c)(1)(ii), or (d)(2) using a combustion, recovery, recapture device, or ECO.
- The EPA is proposing to correct a reference error in 40 CFR 63.1430(c), (d)(1), (d)(1)(i), and (k) such that the paragraphs point to not only table 5 to 40 CFR part 63, subpart PPP, but also table 6 to 40 CFR part 63, subpart PPP.
- The EPA is proposing to add at 40 CFR 63.1439(d)(11) requirements to maintain records of excursions. The EPA is proposing to require that sources keep records of this information to ensure that there is adequate information to allow the EPA to determine the severity of any failure to meet a standard, and to provide data that may

document how the source met the general duty to minimize emissions when the source has failed to meet an applicable standard.

- The EPA is proposing to clarify at 40 CFR 63.1439(e)(6)(i) that all Periodic Reports must contain the company name and address (including county), as well as the beginning and ending dates of the reporting period.
- The EPA is proposing to clarify at 40 CFR 63.1439(e)(6)(iii)(B) that for each excursion reported in a Periodic Report, the owner or operator must include the start date and time, duration, cause, a list of the affected sources or equipment, an estimate of the quantity of each regulated pollutant emitted over any emission limit, a description of the method used to estimate the emissions, actions taken to minimize emissions, and any corrective action taken.
- The EPA is proposing to clarify at 40 CFR 63.1439(e)(6)(iii)(C) that for periods when monitoring data were not collected, the Periodic Report must include start date, start time, and duration of each period when monitoring data were not collected.
- The EPA is proposing to clarify at 40 CFR 63.1439(e)(6)(ix)(C)(*2*) that for PRDs in organic HAP service, Periodic Reports must include “start date, start time, and duration in minutes of the pressure release” instead of “date, time, and duration of the pressure release.”
- The EPA is proposing to insert the missing word “releases” at 40 CFR 63.1439(e)(6)(ix)(C)(*5*) to clarify that we mean “pressure releases,” not “pressure.”
- The EPA is proposing to remove the entry for 40 CFR 63.6(e) of table 1 to the PEPO NESHAP because it is unnecessary given that there are already entries in the table for all subparagraphs associated with 40 CFR 63.6(e). We are also proposing to change “yes” to “no” for the entry for 40 CFR 63.6(e)(2) because this provision has no requirement and is “[Reserved].”

- The EPA is proposing to add an entry for 40 CFR 63.7(a)(4) into table 1 to the PEPO NESHAP because it is missing and is applicable.
- The EPA is proposing to revise the entries for 40 CFR 63.10(b)(2) and (d)(5) of table 1 to the PEPO NESHAP to specify where the recordkeeping and reporting requirements are in the PEPO NESHAP.
- The EPA is proposing to edit the title of table 2 to the PEPO NESHAP to include "and Group 1 Polymers and Resins" because the content in the table contains provisions related the P&R I NESHAP.
- The EPA is proposing to correct several explanations in table 2 to the PEPO NESHAP to refer to the correct paragraph(s) for certain requirements being proposed in this action.
- In reviewing cross-references between the PEPO NESHAP and P&R I NESHAP, the EPA noticed that, even though the rule text exists, the EPA inadvertently removed the "(iii)" for paragraph 40 CFR 63.506(e)(6)(iii) in its recent final rulemaking (see 89 FR 42932, May 16, 2024) and is proposing to correct this typographical error by adding the "(iii)" back into the P&R I NESHAP. This proposed edit does not change any rule text within 40 CFR 63.506(e)(6)(iii).

F. What compliance dates are we proposing?

The proposed amendments in this rulemaking for adoption under CAA sections 112(d)(2) and (3) and 112(h) (see section IV.D of this preamble) and CAA section 112(d)(6) (see section IV.C of this preamble) are subject to the compliance deadlines outlined in the CAA under section 112(i). The proposed amendments in this rulemaking for adoption under CAA section 112(f) (see section IV.B of this preamble) are subject to the compliance deadlines outlined in the CAA under section 112(f)(4).

For all the requirements we are proposing under CAA sections 112(d)(2), (3), and (6), and 112(h) (except for the fenceline monitoring requirements), we are proposing at 40 CFR

63.1422(h) that existing affected sources and affected sources that were new sources under the current PEPO NESHAP (*i.e.*, they commenced construction or reconstruction after September 4, 1997, and on or before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**) must comply with all of the amendments no later than 3 years after the effective date of the final rule or upon startup, whichever is later. For existing sources, CAA section 112(i) provides that the compliance date shall be as expeditious as practicable, but no later than 3 years after the effective date of the standard. ("Section 112(i)(3)'s three-year maximum compliance period applies generally to any emission standard . . . promulgated under [section 112]." *Association of Battery Recyclers v. EPA*, 716 F.3d 667, 672 (D.C. Cir. 2013)). In determining what compliance period is as expeditious as practicable, we consider the amount of time needed to plan and construct projects and to change operating procedures. As provided in CAA section 112(i) and 5 U.S.C. 801(3), all new affected sources that commenced construction or reconstruction after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]** would be required to comply with these requirements upon the effective date of the final rule or upon startup, whichever is later. The EPA anticipates that the effective date of the final rule will be the publication date of the final rule.

For fenceline monitoring, we are proposing at 40 CFR 63.1422(n) that owners and operators of all existing affected sources and all affected sources that were new under the current rule (*i.e.*, sources that commenced construction or reconstruction after September 4, 1997, and on or before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**) must begin fenceline monitoring 2 years after the effective date of the final rule and, starting 3 years after the effective date of the final rule, must perform root cause analysis and apply corrective action requirements upon exceedance of the annual average concentration action level.

For all of the requirements we are proposing under CAA section 112(f), we are proposing at 40 CFR 63.1422(m) a compliance date of 2 years after the effective date of the final rule or upon startup, whichever is later, for all existing affected sources and for all affected sources that

were new sources under the current PEPO NESHAP (*i.e.*, they commenced construction or reconstruction after September 4, 1997, and on or before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**), to comply with the proposed EtO requirements. For all new affected sources that commence construction or reconstruction after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, we are proposing that owners or operators comply with the EtO requirements upon the effective date of the final rule or upon startup, whichever is later.

1. Rationale for Proposed Compliance Dates of Proposed CAA Sections 112(d)(2) and (3) and 112(h) Amendments

We are proposing new operating and monitoring requirements under CAA sections 112(d)(2) and (3) for PEPO flares. We anticipate that these provisions would require the installation of new flare monitoring equipment, and we project that most PMPUs would install new control systems to monitor and adjust assist gas (air or steam) addition rates. Similar to the addition of new control equipment, these new monitoring requirements for flares would require engineering evaluations, solicitation and review of vendor quotes, contracting and installation of the equipment, and operator training. Installation of new monitoring and control equipment on flares will require the flare to be taken out of service. Depending on the configuration of the flares and flare header system, taking the flare out of service may also require a significant portion of the PMPU to be shut down. Therefore, for all existing affected sources, and all new affected sources under the current PEPO NESHAP that commenced construction or reconstruction after September 4, 1997, and on or before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, we are proposing that it is necessary to provide 3 years after the effective date of the final rule (or upon startup, whichever is later) for owners or operators to comply with the new operating and monitoring requirements for flares. For all new affected sources that commence construction or reconstruction after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, we are proposing that owners or operators

comply with the new operating and monitoring requirements for flares upon the effective date of the final rule or upon startup, whichever is later.

Under CAA sections 112(d)(2) and (3), we are proposing new vent control requirements for bypasses. These requirements would typically require the addition of piping and potentially new control requirements. As owners or operators would most likely route these bypass emissions to a flare, we are proposing for all existing affected sources, and new affected sources under the current PEPO NESHAP that commenced construction or reconstruction after September 4, 1997, and on or before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, to provide 3 years after the effective date of the final rule (or upon startup, whichever is later) to allow for owners or operators to coordinate these bypass modifications with the installation of the new monitoring equipment for the flares. For all new affected sources that commence construction or reconstruction after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, we are proposing that owners or operators comply with the new vent control requirements for bypasses upon the effective date of the final rule or upon startup, whichever is later.

We are also proposing to establish work practice standards in the PEPO NESHAP for maintenance activities. We anticipate that sources will need time to: review and update their standard operating procedures for maintenance activities; identify the most appropriate preventive measures or control approaches; design, install, and test the control systems; and install necessary process instrumentation and safety systems if so required. Therefore, for all existing affected sources, and all new affected sources under the current PEPO NESHAP that commenced construction or reconstruction after September 4, 1997, and on or before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, we are proposing a compliance date of 3 years after the effective date of the final rule (or upon startup, whichever is later) for owners or operators to comply with the work practice standards for maintenance activities. For all new affected sources that commence construction or reconstruction after

[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER], we are proposing that owners or operators comply with the work practice standards for maintenance activities upon the effective date of the final rule or upon startup, whichever is later.

Other amendments we are proposing under CAA sections 112(d)(2) and (3) include LDAR requirements for pressure vessels, process vent control requirements for certain surge control vessels and bottoms receivers, control requirements for certain transfer racks, the addition of butylene oxide to the definition of "epoxide" in 40 CFR 63.1423(b) and to the list of HAP presented in table 4 to the PEPO NESHAP, and the removal of the exemption in 40 CFR 63.1420(d)(3) for reactions or processing that occur after completion of epoxide polymerization and all catalyst removal steps. We anticipate that any of these proposed provisions may require additional time to plan, purchase, and install equipment for emissions control; however, even if additional time is not needed, the EPA recognizes the confusion that multiple different compliance dates for individual requirements would create and the additional burden such an assortment of dates would impose. Therefore, for all existing affected sources, and all new affected sources under the current rules that commenced construction or reconstruction after September 4, 1997, and on or before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, we are proposing a compliance date of 3 years after the effective date of the final rule (or upon startup, whichever is later) for owners or operators to comply with these other proposed amendments. For all new affected sources that commence construction or reconstruction after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, we are proposing that owners or operators comply with these other proposed amendments upon the effective date of the final rule or upon startup, whichever is later.

2. Rationale for Proposed Compliance Dates of Proposed CAA Section 112(d)(6) Amendments

As a result of our technology review for PEPO heat exchange systems, we are proposing to replace the existing leak definition and monitoring method with a new leak definition and monitoring method. We project that some owners and operators would require engineering

evaluations, solicitation and review of vendor quotes, contracting and installation of monitoring equipment, and operator training. In addition, facilities will need time to read and understand the amended rule requirements and to update standard operating procedures. Therefore, we are proposing that all existing affected sources, and all new affected sources under the current rule that commenced construction or reconstruction after September 4, 1997, and on or before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, must comply with the new monitoring requirements for heat exchange systems no later than 3 years after the effective date of the final rule (or upon startup, whichever is later). For all new affected sources that commence construction or reconstruction after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, we are proposing that owners or operators comply with the new monitoring requirements for heat exchange systems upon the effective date of the final rule or upon startup, whichever is later.

Under our technology review for PEPO storage vessels under CAA section 112(d)(6), we are revising the PEPO NESHAP to reflect more stringent storage vessel capacity and MTVP thresholds. Although we did not find any PEPO storage vessels that would be affected by these proposed provisions, we believe it would be unnecessarily cumbersome to impose different compliance dates for these new storage vessel requirements. The EPA recognizes the confusion that multiple different compliance dates for individual requirements would create and the additional burden that such an assortment of dates would impose. Therefore, we are proposing that all existing affected sources, and all new affected sources under the current rules that commenced construction or reconstruction after September 4, 1997, and on or before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, must comply with the new storage vessel requirements no later than 3 years after the effective date of the final rule (or upon startup, whichever is later). For all new affected sources that commence construction or reconstruction after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**,

we are proposing that owners or operators comply with the new storage vessel requirements upon the effective date of the final rule or upon startup, whichever is later.

We are also proposing, pursuant to CAA section 112(d)(6), to remove the 50-ppmv and 0.005-scmm Group 1 process vent thresholds from the definition of "Group 1 continuous process vent" for continuous process vents associated with nonepoxide organic HAP and the Group 1 process vent applicability associated with a PMPU using THF, and to instead require owners and operators of these process vents that emit greater than or equal to 1.0 lb/hr of total organic HAP to meet the current control standards in the PEPO NESHAP. Additionally, as a result of our technology review for PEPO Group 1 combination of batch process vents, we are proposing that owners and operators of batch process vents that release a total of annual organic HAP emissions greater than or equal to 4,536 kg/yr (10,000 lb/yr) from all batch process vents combined reduce emissions of organic HAP from these process vents using a flare meeting the proposed operating and monitoring requirements for flares; or reduce emissions of organic HAP or TOC by 90-percent by weight. We project that some owners and operators will need to install new control equipment and/or new hard-piping or ductwork for certain process vents because of the proposed applicability revisions. The addition of new control equipment would require engineering design, solicitation, and review of vendor quotes, and contracting and installation of the equipment, which would need to be timed with process unit outage and operator training. Therefore, we are proposing that all existing affected sources, and all new affected sources under the current rules that commenced construction or reconstruction after September 4, 1997, and on or before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, must comply with the new process vent requirements no later than 3 years after the effective date of the final rule (or upon startup, whichever is later). For all new affected sources that commence construction or reconstruction after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, we are proposing that owners or operators comply with the new process vent requirements upon the effective date of the final rule or upon startup, whichever is later.

Compliance dates for the fenceline monitoring provisions proposed under CAA section 112(d)(6) consider the amount of time that it will take owners and operators to develop their siting plans and secure the capabilities to conduct the monitoring and analyze the results. For fenceline monitoring, the compliance timeline also must consider the timeline for controls addressing EtO emissions to be installed and operational before monitoring can begin to develop the annual average concentration baseline. After a year, if the annual average concentration exceeds the action level, root cause analysis and application of corrective measures can take place. Therefore, we are proposing that owners and operators of all existing sources and all new affected sources under the current rule that commenced construction or reconstruction after September 4, 1997, and on or before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]** must begin fenceline monitoring 2 years after the effective date of the final rule. The 2-year period provides owners and operators with time to: read and assess the new fenceline monitoring requirements; prepare sampling and analysis plans; develop and submit site-specific monitoring plans; identify representative, accessible, and secure monitoring locations for offsite monitors and obtain permission from the property owner to both place and routinely access the monitors; make any necessary physical improvements to fenceline areas to accommodate site monitors, including construction of access roads, physical fencing, and potential drainage improvements; and obtain approval of any necessary capital expenditures. We are also proposing that owners and operators of such sources perform root cause analysis and apply corrective action requirements upon exceedance of an annual average concentration action level starting 3 years after the effective date of the final rule.

For all new affected sources that commence construction or reconstruction after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, we are proposing that owners or operators begin fenceline monitoring upon the effective date of the final rule or upon startup, whichever is later. We are also proposing to require quarterly reporting of fenceline results beginning 1 year after monitoring begins for such sources.

3. Rationale for Proposed Compliance Dates of Proposed CAA Section 112(f) Amendments

As previously mentioned in this preamble, we are proposing, under CAA section 112(f), new provisions considering results of the risk assessments to address emissions of EtO from equipment leaks, heat exchange systems, process vents, storage vessels, and wastewater at PEPO processes. CAA section 112(f)(4) prescribes the compliance date for emission standards issued under CAA section 112(f). *Ass'n of Battery Recyclers* v. *EPA, 716 F.3d 667, 672 (D.C. Cir. 2013)* ("[S]ection 112(f)(4)'s two-year maximum applies more specifically to standards 'under this subsection,' *i.e.*, section 112(f)."). For existing sources, the earliest compliance date for CAA section 112(f) standards is 90 days after the effective date. However, the compliance period can be extended up to 2 years after the effective date if the EPA finds that more time is needed for the installation of controls and that steps will be taken during the period of the waiver to assure that the health of persons will be protected from imminent endangerment. 42 U.S.C. 7412(f)(4)(B). The EPA anticipates that the proposed provisions will require additional time to plan, purchase, and install equipment for EtO control. For example, for PEPO process vents in EtO service, if the affected source cannot demonstrate 99.9-percent control of EtO emissions, or reduce EtO emissions to less than 1 ppmv (from each process vent) or 5 lb/yr (for all combined process vents), then the owner or operator would need to install a new control system, such as a scrubber with piping, ductwork, feed tanks, *etc.* Similarly, this same scenario (*i.e.*, installation of a new control system) may be necessary for storage vessels in order to reduce EtO emissions by greater than or equal to 99.9 percent by weight or to a concentration of less than 1 ppmv. Likewise, a new steam stripper may be needed to control wastewater with a total annual average concentration of EtO greater than or equal to 1 ppmw. Additional permits may be required for this new emission control equipment (*e.g.*, New Source Review and/or title V permit modifications). In other words, the EPA anticipates that facilities will need sufficient time to properly engineer the project, obtain capital authorization and funding, procure the equipment, obtain permits, and construct and start up the equipment. Therefore, in the absence of any

determination by the EPA that a PEPO affected source is presenting imminent endangerment, we are proposing a compliance date of 2 years after the effective date of the final rule or upon startup, whichever is later, for all existing affected sources, and all new affected sources under the current rule that commenced construction or reconstruction after September 4, 1997, and on or before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]** to comply with the proposed EtO requirements. For all new affected sources that commence construction or reconstruction after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, we are proposing that owners or operators comply with the EtO requirements upon the effective date of the final rule or upon startup, whichever is later.

4. Rationale for Proposed Compliance Dates of Other Proposed Amendments

We are proposing electronic reporting requirements (see section IV.E.2 of this preamble) and we anticipate that facilities would need some time to successfully accomplish these reporting revisions, including time to read and understand the amended rule requirements, to make any necessary adjustments (including adjusting standard operating procedures), and to convert reporting mechanisms and install necessary hardware and software. We are also proposing to add control device operational and monitoring requirements for adsorbers that cannot be regenerated and regenerative adsorbers that are regenerated offsite (including a requirement to use dual adsorbent beds in series) (see section IV.E.5. of this preamble). We anticipate that facilities would need some time to purchase and install a second adsorber bed. As previously mentioned, the EPA recognizes the confusion that multiple different compliance dates for individual requirements would create and the additional burden that such an assortment of dates would impose. From our assessment of the timeframe needed for compliance with both the new proposed electronic reporting requirements for flare management plans, compliance reports, and performance evaluation reports, and the new proposed adsorber requirements, the EPA considers a period of 3 years after the effective date of the final rule to be the most expeditious compliance period practicable. Thus, we are proposing that all existing affected sources, and all new affected

sources under the current rule that commenced construction or reconstruction after September 4, 1997, and on or before **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]** be in compliance with these revised requirements upon initial startup or within 3 years of the effective date of the final rule, whichever is later. For all new affected sources that commence construction or reconstruction after **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, we are proposing that owners or operators comply with these revised requirements upon the effective date of the final rule or upon startup, whichever is later. However, we are proposing to provide 60 days after the effective date of the final rule (or upon startup, whichever is later) for owners or operators of all affected sources to comply with the requirement to submit performance test reports electronically according to the proposed procedures specified in 40 CFR 63.1439(e)(9)(iii).

V. Summary of Cost, Environmental, and Economic Impacts

A. What are the affected sources?

There are 25 facilities subject to the PEPO NESHAP. The list of facilities is available in the document titled *List of Facilities Subject to the PEPO NESHAP*, which is available in the docket for this rulemaking.

B. What are the air quality impacts?

This proposed action would reduce HAP and VOC emissions from PEPO emission sources. We estimate that the proposed amendments to the NESHAP, excluding the proposed EtO emission standards, would reduce overall VOC and HAP emissions from the PEPO Production source category by approximately 164 and 157 tpy, respectively. Additionally, the proposed EtO emission standards are expected to reduce EtO emissions by approximately 14 tpy. We note that these emissions reductions do not consider the potential excess emissions reductions from flares that could result from the proposed monitoring requirements; we estimate flare excess emissions reductions of 75 tpy HAP and 281 tpy VOC.

Considering secondary impacts (*e.g.*, emission increases associated with supplemental fuel or additional electricity), the EPA estimates that the proposed action would result in additional emissions of 155 tpy of carbon monoxide (CO), 242,000 tpy of carbon dioxide (CO_2), 188 tpy of nitrogen oxides (NO_x) (including 4 tpy of nitrous oxide), 14 tpy of particulate matter, 1.0 tpy of sulfur dioxide (SO_2), and a reduction of 996 tpy of methane emissions. More information about the estimated emission reductions and secondary impacts of this proposed action for the PEPO NESHAP can be found in the Economic Impact Analysis (EIA) accompanying this proposal and in documents referenced in sections IV.B through IV.D of this preamble.

C. What are the cost impacts?

The EPA estimates that this proposed action would cumulatively cost (in 2022 dollars) approximately $31.0 million in total capital costs and $18.7 million per year in total annualized costs (including product recovery), based on our analysis of the proposed action described in sections IV.B through IV.D of this preamble. The present value (PV) of the estimated costs of this proposed rule, discounted at a 2 percent rate over the 2026 to 2040 period, is estimated at $236 million with an estimated equivalent annualized value (EAV) of $18.4 million without product recovery. With product recovery, the PV is estimated at $235 million with an estimated EAV of $18.3 million. The overall difference caused by product recovery is relatively minor, at less than a 0.43 percent decrease in both the PV and EAV.

Although the EPA does not factor in cost when setting a MACT floor level of control, we estimated the cost of the standards proposed pursuant to CAA sections 112(d)(2) and (3) and 112(h) to include in the cumulative costs of the proposed action.

Table 13 of this preamble summarizes the results of the impact estimates for flares in the PEPO Production source category that control emissions from PEPO processes.

Table 13. Nationwide Cost Impacts for Flares in the PEPO Production Source Category That Control Emissions from PEPO Processes

Control Description	Total Capital Investment (million $)	Total Annualized Costs (million $/yr)
Flare Operational and Monitoring Requirements	11.5	2.82
Work Practice Standards for Flares Operating Above Their Smokeless Capacity	0.20	0.05
Total	11.7	2.88

For the proposed equipment opening work practice standard, discussed in section IV.D.3.a, we expect that all PEPO facilities already have standard procedures in place when performing equipment openings (at the very least for safety reasons), with the exception of one facility, which is a small business that is co-located with a HON facility and is already accounted for under the recent HON rulemaking (see 89 FR 42932). As such, the only costs incurred are for recordkeeping after each non-conforming event. We estimated the annual costs to be $11,000 per year.

We estimated the annual cost of the proposed storage vessel degassing work practice standard, discussed in section IV.D.3.b, to be $7,100.

For the proposed requirement to control working emissions from storage vessels during routine maintenance, discussed in section IV.D.3.c, we determined that the total capital cost of a 55-gallon activated carbon drum with two connections, including piping and ductwork, is approximately $1,500, based on vendor quotes. Following the guidelines of the EPA Control Cost Manual,[88] we estimated that the annual cost per PMPU is $259. Thus, we estimated the nationwide capital cost for removal of the 240-hour exemption provisions (except for vessel breathing losses) for the PEPO NESHAP would be $22,500 and the annualized costs would be $3,900.

[88] EPA Air Pollution Control Cost Manual - Section 3: VOC Controls; Section 3.1: VOC Recapture Controls, Carbon Adsorbers Calculation Spreadsheet. Retrieved from *https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution. October 2018*.

We estimate that the nationwide capital cost for the proposed pressure vessel LDAR requirements discussed in section IV.D.4 would be about $3,800 and the annualized capital costs would be $3,500.

We anticipate that the following proposed changes would impose minimal costs: prohibiting bypasses of the APCD (discussed in section IV.D.2); setting MACT standards for transfer racks (discussed in section IV.D.6); inclusion of butylene oxide in the definition of epoxide and the list of HAP in table 4 to the PEPO NESHAP (discussed in section IV.D.7).

D. What are the economic impacts?

The EPA conducted an EIA for this proposal, in a document titled *Economic Impact Analysis*, which is available in the docket for this action. The EIA contains two parts. The EPA calculated the economic impacts of the proposal on small entities as the percentage of total annualized costs incurred by affected ultimate parent owners to their revenues. This ratio provides a measure of the direct economic impact to ultimate parent owners of PEPO facilities while presuming no impact on consumers. We estimate that the only small business impacted by the proposal will incur total annualized costs of 0.68 percent of its revenue both with and without product recovery. The Regulatory Flexibility Act (RFA) section later in this preamble and the EIA for this proposed rulemaking provide more explanation of these economic impacts.

E. What are the benefits?

The emissions controls required by these rules are expected to reduce emissions of a number of HAP. The proposed amendments to the PEPO NESHAP, excluding the EtO emission standards and the new flare requirements, would reduce HAP emissions from PEPO sources by approximately 157 tpy. The proposed EtO emission standards are projected to reduce EtO emissions from PEPO processes by approximately 14 tpy. We also estimate that the proposed amendments to the NESHAP will reduce excess emissions of HAP from flares in the PEPO Production source category by an additional 75 tpy.

Quantifying and monetizing the economic value of reducing the risk of cancer and non-cancer effects is made difficult by the lack of a central estimate of cancer and non-cancer risk and the lack of estimates of the value of an avoided case of cancer (fatal and non-fatal) and morbidity effects. Due to methodology and data limitations, we did not attempt to monetize the health benefits of reductions in HAP emissions in this analysis. With regard to emissions changes, the EPA is unable to assess the total costs, benefits, and distributional consequences of these actions at the community/neighborhood level.

EtO is used in the production of PEPO. Health effects from acute (short-term) exposure to EtO in humans consist mainly of central nervous system depression and irritation of the eyes and mucous membranes. Chronic (long-term) exposure to EtO in humans can cause irritation of the eyes, skin, nose, throat, and lungs, and damage to the brain and nervous system. There is also some evidence linking EtO exposure to reproductive effects.[89] The International Agency for Research on Cancer has classified EtO as a known human carcinogen.[90] The EPA's IRIS characterized EtO as "carcinogenic to humans" by the inhalation route of exposure based on the total weight of evidence (U.S. EPA, 2016), in accordance with the EPA's Guidelines for Carcinogen Risk Assessment.[91] The EPA concluded that there was strong, but less than conclusive on its own, epidemiological evidence of lymphohematopoietic cancers and breast cancer in EtO-exposed workers (U.S. EPA, 2016). People living near PEPO production facilities that emit EtO may have an increased risk of developing lymphoid cancers and, for females, breast cancer.[92] We conclude that reducing EtO emissions from PEPO production facilities will

[89]ATSDR. *Toxicological Profile for Ethylene Oxide*. U.S. Department of Health and Human Services. 2022. Available at *https://www.atsdr.cdc.gov/toxprofiles/tp137.pdf*.

[90] International Agency for Research on Cancer. *Chemical Agents and Related Occupations. Volume 100F, A Review of Human Carcinogens*. 2012. Available at *https://publications.iarc.fr/Book-And-Report-Series/Iarc-Monographs-On-The-Identification-Of-Carcinogenic-Hazards-To-Humans/Chemical-Agents-And-Related-Occupations-2012*.

[91] U.S. EPA. *Guidelines for Carcinogen Risk Assessment.* 2005. Available at *https://www.epa.gov/risk/guidelines-carcinogen-risk-assessment*.

[92] U.S. EPA. *Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide. Integrated Risk Information System (IRIS) on Ethylene Oxide*. National Center for Environmental Assessment, Washington DC. 2016.

significantly reduce the cancer risk for exposed populations (see sections IV.A.1 and IV.B.3 of this preamble).

The emission controls installed to comply with these proposed rules are also expected to reduce VOC emissions which, in conjunction with NO_x and in the presence of sunlight, form ground-level ozone (O_3). To assess O_3-related human health impacts, the EPA consults the *Integrated Science Assessment for Ozone* (Ozone ISA)[93] as summarized in the *Technical Support Document for the Final Revised Cross State Air Pollution Rule Update*.[94] In brief, the Ozone ISA found short-term (less than 1 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 Ozone ISA reported that long-term exposures (1 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, and total mortality.

F. What analysis of environmental justice did we conduct?

For purposes of analyzing regulatory impacts, the EPA relies upon its June 2016 *Technical Guidance for Assessing Environmental Justice in Regulatory Analysis*, which provides recommendations that encourage analysts to conduct the highest quality analysis feasible, recognizing that data limitations, time, resource constraints, and analytical challenges will vary by media and circumstance. The Technical Guidance states that a regulatory action may involve potential EJ concerns if it could: (1) create new disproportionate impacts on communities with

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[93] U.S. EPA (2020). *Integrated Science Assessment for Ozone and Related Photochemical Oxidants*. U.S. EPA. Washington, DC. Office of Research and Development. EPA/600/R-20/012. Available at: *https://www.epa.gov/isa/integrated-science-assessment-isa-ozone-and-related-photochemical-oxidants*.

[94] U.S. EPA. 2021. *Technical Support Document (TSD) for the Final Revised Cross-State Air Pollution Rule Update for the 2008 Ozone Season NAAQS Estimating PM2.5- and Ozone-Attributable Health Benefits*. *https://www.epa.gov/sites/default/files/2021-03/documents/estimating_pm2.5-_and_ozone-attributable_health_benefits_tsd.pdf*.

EJ concerns; (2) exacerbate existing disproportionate impacts on communities with EJ concerns; or (3) present opportunities to address existing disproportionate impacts on communities with EJ concerns through this action under development.

The EPA's EJ technical guidance states that "[t]he analysis of potential EJ concerns for regulatory actions should address three questions: (A) Are there potential EJ concerns associated with environmental stressors affected by the regulatory action for population groups of concern in the baseline? (B) Are there potential EJ concerns associated with environmental stressors affected by the regulatory action for population groups of concern for the regulatory option(s) under consideration? (C) For the regulatory option(s) under consideration, are potential EJ concerns created or mitigated compared to the baseline?"[95]

The EJ analysis is presented for the purpose of providing the public with as full as possible an understanding of the potential impacts of this proposed action. The EPA notes that analysis of such impacts is distinct from the determinations proposed in this action under CAA section 112, which are based solely on the statutory factors the EPA is required to consider under that section.

1. PEPO Production Source Category Demographics

For the PEPO Production source category, the EPA examined the potential for the 23 PEPO facilities (for which the EPA had HAP emissions inventories for emissions from the PEPO category[96]) to pose concerns to communities living in proximity to facilities, both in the baseline and under the control option proposed in this proposed action. Specifically, to examine the potential for EJ concerns, the EPA conducted three different demographic analyses of the populations living within 10 km and 50 km of the PEPO facilities: a proximity analysis; a baseline cancer risk-based analysis (*i.e.*, before implementation of any controls required by this

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[95] *Technical Guidance for Assessing Environmental Justice in Regulatory Analysis*, U.S. EPA, June 2016. Quote is from Section 3 – Key Analytic Considerations, page 11.

[96] Note that there are 25 facilities identified as subject to the PEPO NESHAP. However, one of these facilities has a PEPO source still under construction and another facility did not have sufficient information to parse out the source category records. Therefore, only 23 facilities were included for the PEPO Production source category analyses.

proposed action); and a post-control cancer risk-based analysis (*i.e.*, after implementation of the controls proposed to be required by this proposed action). In this preamble, we focus on the results from the demographic analyses using a 10 km radius because this area captures the majority of the population with higher cancer risks due to HAP emissions from PEPO facilities. Specifically, 100 percent of the population with baseline cancer risks greater than or equal to 50-in-1 million from PEPO Production source category emissions lives within 10 km of the PEPO facilities. The methodology and detailed results of the demographic analyses, including the demographic analyses for populations living within 50 km of facilities, are presented in the document titled *Analysis of Demographic Factors for Populations Living Near Polyether Polyols (PEPO) Production Facilities – Source Category Analysis of Proposed Amendments*, which is available in the docket for this rulemaking.

For all three demographic analyses, the affected populations (*i.e.*, those living within 10 km of the facilities) are compared to the national population. The total population, population percentages, and population count for each demographic group for the entire U.S. population are shown in the column titled "Nationwide Average for Reference" in tables 14 through 16 of this preamble. These national data are provided as a frame of reference to compare the results of the proximity analysis, the baseline cancer risk-based analysis, and the post-control cancer risk-based analysis.

Detailed results of the PEPO Production source category demographic analyses are located in subsections a (proximity analysis), b (baseline risk-based analysis), and c (post-control risk-based analysis) of this section V.F.1 of the preamble. The following paragraphs briefly summarize the results of these demographic analyses.

The results of the proximity analysis indicate that a total of 1.4 million people live within 10 km of the 23 PEPO facilities analyzed. The percent of the population living within 10 km of the PEPO facilities is above the corresponding national average for the following demographic groups: Black, Hispanic or Latino, people living below the poverty level, people living below

two times the poverty level, people over the age of 25 without a high school diploma, and people that are age 0 to 17. The results of the proximity analysis indicate that the proportion of other demographic groups living within 10 km of PEPO facilities is similar to or below the national average. The baseline cancer risk-based demographic analysis, which focuses on populations that have higher cancer risks, suggests that disparities exist for the same demographic groups as seen in the proximity analysis.

The post-control risk-based demographic analysis shows that the controls proposed to be required by this proposed action would notably reduce the number of people who are exposed to cancer risks resulting from PEPO Production source category emissions at all risk levels. At greater than or equal to a cancer risk of 1-in-1 million, the number of individuals exposed would decrease from 834,000 to 592,000. The demographic composition of those individuals exposed to cancer risk greater than or equal to 1-in-1 million post-control is similar to the demographic composition of the individuals exposed to a cancer risk of 1-in-1 million at baseline. At greater than or equal to a cancer risk of 50-in-1 million, the number of individuals exposed would decrease from 28,000 to 1,600. The demographic composition of those individuals exposed to cancer risk greater than or equal to 50-in-1 million post-control is above the corresponding national average for the following demographic groups: Black, Hispanic or Latino, age 0-17, people living below the poverty level, people living below two times the poverty level, and those over 25 without a high school education. After control is implemented, the number of people who are exposed to cancer risks greater than 100-in-1 million resulting from PEPO Production source category emissions would decrease from 3,300 to zero. Therefore, there are no disparities among demographic groups at this risk level. The actions of this proposed rulemaking would improve human health of current and future populations that live near these facilities. For more details see the remainder of this section V.F of the preamble.

a. Proximity Analysis

The column titled “Proximity Analysis for Population Living Within 10 km of PEPO Facilities” in tables 14 through 16 of this preamble shows the share and count of people for each of the demographic categories for the total population living within 10 km (~6.2 miles) of PEPO facilities. These are the results of the proximity analysis and are repeated in tables 14 through 16 of this preamble for easy comparison to the risk-based analyses discussed later in this preamble.

Approximately 1.4 million people live within 10 km of the 23 PEPO facilities assessed. The results of the proximity demographic analysis indicate that the percentages of the population that is Black (13 percent, 192,000 people), Hispanic or Latino (22 percent, 320,000 people) are higher than the national average (12 percent and 19 percent, respectively). The percentages of people living below the poverty level (14 percent, 196,000 people) and below 2 times the poverty level (31 percent, 446,000 people) are also higher than the national average (14 percent and 31 percent, respectively). In addition, the percentage of people over the age of 25 without a high school diploma (14 percent, 197,000 people) is higher than the national average (12 percent). The proximity analysis indicates that the proportion of other demographic groups living within 10 km of PEPO facilities is similar to or below the national average.

b. Baseline Risk-Based Demographics

The baseline risk-based demographic analysis results are shown in the “baseline” column of tables 14 through 16 of this preamble. This analysis focused on the populations living within 10 km (~6.2 miles) of the PEPO facilities with estimated cancer risks greater than or equal to 1-in-1 million resulting from PEPO Production source category emissions (table 14 of this preamble), greater than or equal to 50-in-1 million (table 15 of this preamble), and greater than 100-in-1 million (table 16 of this preamble). The risk analysis indicated that emissions from the source category, prior to the controls proposed to be required in this action, expose 834,000 people living near 18 facilities to a cancer risk greater than or equal to 1-in-1 million, 28,000 people living near 10 facilities to a cancer risk greater than or equal to 50-in-1 million, and 3,300 people living near 6 facilities to a cancer risk greater than 100-in-1 million.

In the baseline, there are 834,000 people living around 18 PEPO facilities with a cancer risk greater than or equal to 1-in-1 million resulting from PEPO Production source category emissions. The 18 PEPO facilities are located across 7 States, but more than two-thirds (14 facilities) of the facilities are located in Texas, West Virginia, and Louisiana. Ninety-seven percent of the people with risks greater than or equal to 1-in-1 million live around these 14 PEPO facilities in Texas, West Virginia, and Louisiana. The overall percent of the baseline population with estimated cancer risks greater than or equal to 1-in-1 million who are Black (15 percent, 129,000 people) is above the average percentage of the national population that is Black (12 percent). Around five PEPO facilities located in Louisiana, the percent of the population with cancer risks greater than or equal to 1-in-1 million resulting from PEPO baseline source category emissions that is Black is more than two times the national average (greater than 24 percent). These five PEPO facilities account for about half of the Black population living within 10 km of PEPO facilities with risks greater than or equal to 1-in-1 million resulting from PEPO Production source category baseline emissions.

The overall percent of the population with cancer risks greater than or equal to 1-in-1 million resulting from PEPO Production source category baseline emissions that is Hispanic or Latino (26 percent, 218,000 people) is higher than that in the baseline proximity analysis (22 percent, 320,000 people) and well above the national average (19 percent). Around three PEPO facilities located in Texas, the percent of the population that is Hispanic or Latino with cancer risks greater than or equal to 1-in-1 million resulting from PEPO baseline source category emissions is more than two times the national average. These three PEPO facilities account for over half of the Hispanic or Latino population living within 10 km of PEPO facilities with risks greater than or equal to 1-in-1 million resulting from PEPO Production source category baseline emissions. The percent of the population that is linguistically isolated with baseline cancer risks greater than or equal to 1-in-1 million is more than twice the national average for one of these three Texas facilities. The percent of the population that is American Indian or Alaskan Native or

Other and Multiracial with risks greater than or equal to 1-in-1 million resulting from PEPO Production source category baseline emissions is below the national average for all facilities.

The percent of the population living below the poverty level and below two times the poverty level with cancer risks greater than or equal to 1-in-1 million resulting from PEPO baseline source category emissions (15 percent and 34 percent, respectively) is above the national average (13 percent and 30 percent, respectively). Around three facilities located in West Virginia, the percent of the population living below the poverty level and below two times the poverty level within 10 km of PEPO facilities with risks greater than or equal to 1-in-1 million resulting from PEPO Production source category baseline emissions is about 10 percent higher than the national average. The percent of the population over 25 years old without a high school diploma with cancer risks greater than or equal to 1-in-1 million resulting from PEPO Production source category baseline emissions (15 percent, 128,000 people) is greater than the national average (12 percent).

In the baseline, there are about 28,000 people living around 10 PEPO facilities with a cancer risk greater than or equal to 50-in-1 million resulting from PEPO Production source category baseline emissions. These 10 PEPO facilities are located across 4 States (Louisiana, Texas, West Virginia, and Kentucky). Sixty percent of the people with risks greater than or equal to 50-in-1 million resulting from PEPO Production source category baseline emissions live within 10 km of one facility, which is located in Louisiana. The overall percent of the population that is Black with baseline cancer risk greater than or equal to 50-in-1 million resulting from PEPO Production source category emissions (10 percent, 2,800 people) is below the national average (12 percent). However, around four PEPO facilities located in Louisiana and West Virginia, the percent of the population with cancer risks greater than or equal to 50-in-1 million resulting from PEPO baseline source category emissions that is Black is more than two times the national average (greater than 24 percent).

The overall percent of the population that is Hispanic or Latino with baseline cancer risk greater than or equal to 50-in-1 million resulting from PEPO Production source category emissions (10 percent, 2,700 people) is below the national average (19 percent). However, around two PEPO facilities located in Texas, the percent of the population with cancer risks greater than or equal to 50-in-1 million resulting from PEPO baseline source category emissions that is Hispanic or Latino is more than two times the national average (*i.e.*, greater than 38 percent). The population near these two facilities in Texas accounts for about 77 percent of the number of Latino/Hispanic people with risks greater than or equal to 50-in-1 million resulting from the PEPO Production source category emissions. The percent of the population that is American Indian or Alaskan Native with risks greater than or equal to 50-in-1 million resulting from PEPO Production source category baseline emissions is below the national average for all facilities. The percent of the population that is Other or Multiracial with risks greater than or equal to 50-in-1 million resulting from PEPO Production source category baseline emissions is below the national average for all but one facility located in West Virginia.

The percentage of the population with cancer risks resulting from PEPO Production source category baseline emissions greater than or equal to 50-in-1 million that are below the poverty level (14 percent), below two times the poverty level (35 percent), and over 25 years old without a high school diploma (16 percent) are above the respective national averages. Around four facilities located in West Virginia, the percentages of the population living below the poverty level and below two times the poverty level within 10 km of PEPO facilities with risks greater than or equal to 50-in-1 million resulting from PEPO Production source category baseline emissions are about 10 percent higher than the national average.

In the baseline, there are 3,300 people living around 6 PEPO facilities with a cancer risk resulting from PEPO Production source category baseline emissions greater than 100-in-1 million. These six PEPO facilities are located in Texas, West Virginia and Louisiana. The percent of the population that is Black with cancer risk greater than 100-in-1 million resulting

from PEPO Production source category baseline emissions (14 percent, 500 people) is above the national average (12 percent). Around two facilities in West Virginia, the percentage of the Black population with cancer risks greater than 100-in-1 million resulting from PEPO Production source category emissions is over two times the national average.

The percentage of the population that is Hispanic/Latino with risks greater than 100-in-1 million resulting from PEPO Production source category emissions (21 percent, 700 people) is above the national average (19 percent). The share of the Hispanic and Latino population with cancer risks greater than 100-in-1 million resulting from PEPO Production source category emissions is driven by one facility in Texas where the percent of the population that is Hispanic/Latino is over three times the national average. The percent of the population that is American Indian or Alaskan Native with risks greater than 100-in-1 million resulting from PEPO Production source category baseline emissions is well below the national average for all facilities.

The percentages of the population with cancer risks greater than 100-in-1 million resulting from PEPO Production source category baseline emissions that are below the poverty level (26 percent, 900 people), below 2 times the poverty level (46 percent, 1,500 people), and over 25 without a high school diploma (30 percent, 1,000 people) are above the respective national averages.

Around four facilities located in West Virginia and Louisiana, the percent of the population with cancer risks greater than 100-in-1 million resulting from PEPO Production source category baseline emissions that are below the poverty level is two to four times the national average. In addition, for two of these facilities located in West Virginia, the population with cancer risks greater than 100-in-1 million resulting from PEPO Production source category baseline emissions that are below two times the poverty level is two times the national average.

In summary, the baseline risk-based demographic analysis, which focuses on populations that are expected to have higher cancer risks resulting from PEPO Production source category

emissions, suggests that Blacks and Hispanic or Latino individuals are disproportionately overrepresented at cancer risk levels of greater than or equal to 1-in-1 million and greater than 100-in-1 million. In addition, the baseline risk-based demographic analysis suggests that populations living below the poverty level and living below two times the poverty level are disproportionately overrepresented at all cancer risk levels. This disproportionate overrepresentation is the greatest in the population with cancer risks greater than 100-in-1 million.

c. Post-Control Risk-Based Demographics

This analysis focused on the populations living within 10 km (~6.2 miles) of the facilities with estimated cancer risks greater than or equal to 1-in-1 million (table 14 of this preamble), greater than or equal to 50-in-1 million (table 15 of this preamble), and greater than 100-in-1 million (table 16 of this preamble) resulting from PEPO Production source category emissions after implementation of the proposed controls ("post-control"). The results of the post-control risk-based demographics analysis are in the column titled "Post-Control" of tables 14 through 16 of this preamble. In this analysis, we evaluated how the projected EtO emission reductions of the proposed standards for PEPO processes described in this action affect the distribution of risks. This evaluation makes it possible to characterize the post-control risks and to evaluate whether the proposed action would create or mitigate potential EJ concerns as compared to the baseline.

The risk analysis indicated that the number of people within 10 km of a facility exposed to risks greater than or equal to 1-in-1 million resulting from PEPO Production source category emissions (table 14 of this preamble) would be reduced from approximately 834,000 people in the baseline to 592,000 people after implementation of the PEPO controls in this proposal. The populations with a cancer risk greater than or equal to 1-in-1 million resulting from PEPO Production source category emissions are located around 18 facilities in the baseline and 16 facilities for post-control.

The post-control population living within 10 km of a facility with estimated cancer risks greater than or equal to 1-in-1 million resulting from PEPO Production source category emissions (table 14 of this preamble) has similar demographic percentages to the baseline population with risks greater than or equal to 1-in-1 million. However, the number of individuals with risks greater than or equal to 1-in-1 million resulting from PEPO Production source category emissions would be reduced in each demographic.

The percentage of the population with risks greater than or equal to 1-in-1 million resulting from PEPO Production source category emissions that is Black is 3 percent higher in the post-control population (18 percent) than in the baseline population (15 percent). However, the number of Black individuals with risks at or above 1-in-1 million would be reduced by almost 25,000 people from 129,000 in the baseline to 105,000 in the post-control scenario.

Similarly, the percentage of the population with risks greater than or equal to 1-in-1 million resulting from PEPO Production source category post-control emissions that is Hispanic/Latino would still be above the national average (25 percent versus 19 percent), but the number of Hispanic/Latino individuals with risks at or above 1-in-1 million would be reduced by about 70,000 people from 218,000 in the baseline to 148,000 in the post-control scenario.

The percent of the population that is American Indian or Alaskan Native with risks greater than or equal to 1-in-1 million resulting from PEPO Production source category emissions (0.2 percent) is below the national average (0.6 percent) in the post-control analysis and populations around all facilities are below the national average. The number of American Indians or Alaskan Natives with risks greater than or equal to 1-in-1 million resulting from PEPO Production source category emissions would be reduced from 2,100 in the baseline to 1,200 in the post-control scenario.

The percentages of the population with risks greater than or equal to 1-in-1 million resulting from PEPO Production source category emissions below the poverty level (15 percent) and below two times the poverty level (34 percent) are the same in the post-control scenario as in

the baseline. However, the number of individuals with risks greater than or equal to 1-in-1 million resulting from PEPO Production source category emissions that are below the poverty level would be reduced by about 35,000 (from 125,000 to 91,000) and those below 2 times the poverty level is reduced by about 78,000 (from 281,000 to 203,000). The percent of individuals over 25 years old without a high school diploma is 1 percent higher in the post-control scenario (16 percent) than in the baseline (15 percent), but the number of individuals with risks greater than or equal to 1-in-1 million resulting from PEPO Production source category emissions would be reduced by almost 35,000, from 128,000 to 93,000. The percentage of the population that is in linguistic isolation with risks greater than or equal to 1-in-1 million resulting from PEPO Production source category emissions is the same in the post-control scenario (5 percent), but the number of individuals would be reduced by almost 11,000 compared to the baseline, from 38,000 to 27,000.

The risk analysis indicated that the number of people living within 10 km of a facility and exposed to risks greater than or equal to 50-in-1 million resulting from PEPO Production source category emissions (table 15 of this preamble) would be reduced significantly, from 28,000 people in the baseline to 1,600 people after implementation of the controls in this proposal. This represents more than a 90 percent reduction in the number of individuals with risk greater than or equal to 50-in-1 million when compared to the baseline. The populations living within 10 km of a facility and with a cancer risk greater than or equal to 50-in-1 million resulting from PEPO Production source category emissions are located around four facilities in the post-control scenario, six fewer facilities than in the baseline. These four facilities are located in Louisiana, Texas, and West Virginia (two facilities). The communities within 10 km of two of those facilities (in Louisiana and Texas) comprise over 80 percent of the population with risks greater than or equal to 50-in-1 million resulting from PEPO Production source category post-control emissions.

The number of individuals with risks greater than or equal to 50-in-1 million would be reduced significantly for each demographic category in the post-control scenario. The percentage of the population with risks greater than or equal to 50-in-1 million resulting from PEPO Production source category emissions that is Black would increase from 10 percent in the baseline to 17 percent in the post-control scenario, which is above the national average (12 percent). However, the number of Black individuals with risks at or above 50-in-1 million would be reduced from 2,800 in the baseline to 300 post-control. Similarly, the percentage of the population with risks greater than or equal to 50-in-1 million resulting from PEPO Production source category emissions that is Hispanic/Latino would increase from 10 percent in the baseline to 25 percent post-control, but the number of Hispanic/Latino individuals with risks at or above 50-in-1 million would be reduced from 2,700 in the baseline to 400 post-control. The number of American Indians or Alaskan Natives with risks greater than or equal to 50-in-1 million resulting from PEPO Production source category emissions would be reduced from about 100 in the baseline to zero post-control.

The percentages of the population with risks greater than or equal to 50-in-1 million resulting from PEPO Production source category post-control emissions whose income is below the poverty level (22 percent) and below two times the poverty level (42 percent) would be higher than from the baseline (14 percent and 35 percent, respectively). However, the number of individuals with risks greater than or equal to 50-in-1 million resulting from PEPO Production source category emissions that are below the poverty level would be reduced from by about 3,700 people (from 4,100 to 400) and those below two times the poverty level would be reduced by about 9,200 people (from 9,900 to 700). The number of individuals with risks greater than or equal to 50-in-1 million resulting from PEPO Production source category emissions that are over 25 years old without a high school diploma or are linguistically isolated would also be greatly reduced post-control.

The risk analysis indicated that the number of people living within 10 km of a facility with risks greater than 100-in-1 million resulting from PEPO Production source category emissions (table 16 of this preamble) would be reduced from 3,300 individuals in the baseline to zero individuals after application of the PEPO controls in this proposal. Therefore, for the post-control risk-based demographic results, there would be no "greater than 100-in-1 million" demographic results to discuss.

In summary, as shown in the post-control risk-based demographic analysis, the controls proposed to be required by this proposal would significantly reduce the number of people expected to have cancer risks greater than or equal to 1-in-1 million, greater than or equal to 50-in-1 million, and greater than 100-in-1 million resulting from PEPO Production source category emissions. Although the number of individuals with risks greater than or equal to 1-in-1 million would be reduced in the post-control scenario (reduced from 834,000 people to 592,000 people), populations of Black individuals, Hispanic/Latino individuals, those living below the poverty level and two times the poverty level, and those over 25 without a high school diploma would remain disproportionately represented. Similarly, the number of individuals with risks greater than or equal to 50-in-1 million would be reduced significantly in the post-control scenario (reduced from 28,000 to 1,600), but the population of Black individuals, Hispanic/Latino individuals, those living below the poverty level and two times the poverty level, and those over 25 without a high school diploma would remain disproportionately represented. Post-control, there would be no individuals with risks greater than 100-in-1 million resulting from PEPO Production source category emissions (reduced from 3,300 people to 0 people).

Table 14. Source Category: Comparison of Baseline and Post-Control Demographics of Populations With Cancer Risk Greater Than or Equal to 1-in-1 Million Resulting From PEPO NESHAP Source Category Emissions Living Within 10 km of Facilities to the National Average and Proximity Demographics

Demographic Group	Nationwide Average for Reference	Proximity Analysis for Total Population Living Within 10 km of PEPO Facilities	Cancer Risk ≥1-in-1 Million Within 10 km of PEPO Facilities	
			Baseline	Post-Control

Total Population	330M	1.4M	834K	592K
Number of Facilities	-	23	18	16
Race and Ethnicity by Percent [Number of People]				
White	60%	59%	54%	53%
	[196M]	[847K]	[450K]	[313K]
Black	12%	13%	15%	18%
	[40M]	[192K]	[129K]	[105K]
American Indian and Alaskan Native	0.6%	0.2%	0.3%	0.2%
	[2.1M]	[3.3K]	[2.1K]	[1.2K]
Hispanic or Latino (white and nonwhite)	19%	22%	26%	25%
	[63M]	[320K]	[218K]	[148K]
Other and Multiracial	9%	5%	4%	4%
	[29M]	[68K]	[34K]	[26K]
Age By Percent [Number of People]				
Age 0 to 17 years	22%	24%	24%	25%
	[74M]	[345K]	[204K]	[147K]
Age 18 to 64 years	62%	61%	61%	61%
	[203M]	[876K]	[511K]	[363K]
Age ≥ 65 years	16%	15%	14%	14%
	[53M]	[210K]	[118K]	[83K]
Income by Percent [Number of People]				
Below Poverty Level	13%	14%	15%	15%
	[42M]	[196K]	[125K]	[91K]
Below 2x Poverty Level	30%	31%	34%	34%
	[100M]	[446K]	[281K]	[203K]
Education by Percent [Number of People]				
Over 25 and without a High School Diploma	12%	14%	15%	16%
	[38M]	[197K]	[128K]	[93K]
Linguistically Isolated by Percent [Number of People]				
Linguistically Isolated	5%	4%	5%	5%
	[17M]	[59K]	[38K]	[27K]

Notes:

- Nationwide population and demographic percentages are based on Census' 2016–2020 American Community Survey (ACS) 5-year block group averages. Total population count is based on 2020 Decennial Census block population.
- To avoid double counting, the "Hispanic or Latino" category is treated as a distinct demographic category. A person who identifies as Hispanic or Latino is counted as Hispanic or Latino, regardless of race.
- The number of facilities represents facilities with a cancer MIR above level indicated. When the MIR was located at a user assigned receptor at an individual residence and not at a census block centroid, we were unable to estimate population and demographics for that facility.
- The sum of individual populations with a demographic category may not add up to total due to rounding. K = Thousands, M = Millions.

Table 15. Source Category: Comparison of Baseline and Post-Control Demographics of Populations With Cancer Risk Greater Than or Equal to 50-in-1 Million Resulting From PEPO NESHAP Source Category Emissions Living Within 10 km of Facilities to the National Average and Proximity Demographics

Demographic Group	Nationwide Average for Reference	Proximity Analysis for Total Population Living Within 10 km of PEPO Facilities	Cancer Risk ≥50-in-1 Million Within 10 km of PEPO Facilities	
			Baseline	Post-Control
Total Population	330M	1.4M	28K	1.6K
Number of Facilities	-	23	10	4
Race and Ethnicity by Percent [Number of People]				
White	60%	59%	77%	56%
	[196M]	[847K]	[22K]	[900]
Black	12%	13%	10%	17%
	[40M]	[192K]	[2.8K]	[300]
American Indian and Alaskan Native	0.6%	0.2%	0.3%	0.0%
	[2.1M]	[3.3K]	[<100]	[0]
Hispanic or Latino (white and nonwhite)	19%	22%	10%	25%
	[63M]	[320K]	[2.7K]	[400]
Other and Multiracial	9%	5%	3%	3%
	[29M]	[68K]	[900]	[<100]
Age By Percent [Number of People]				
Age 0 to 17 years	22%	24%	23%	29%
	[74M]	[345K]	[6.4K]	[500]
Age 18 to 64 years	62%	61%	57%	57%
	[203M]	[876K]	[16.3K]	[900]
Age ≥ 65 years	16%	15%	20%	15%
	[53M]	[210K]	[5.7K]	[200]
Income by Percent [Number of People]				
Below Poverty Level	13%	14%	14%	22%
	[42M]	[196K]	[4.1K]	[300]
Below 2x Poverty Level	30%	31%	35%	42%
	[100M]	[446K]	[9.9K]	[700]
Education by Percent [Number of People]				
Over 25 and without a High School Diploma	12%	14%	16%	32%
	[38M]	[197K]	[4.4K]	[500]
Linguistically Isolated by Percent [Number of People]				
Linguistically Isolated	5%	4%	2%	1%
	[17M]	[59K]	[500]	[<100]

Notes:

- Nationwide population and demographic percentages are based on Census' 2016–2020 ACS 5-year block group averages. Total population count is based on 2020 Decennial Census block population.
- To avoid double counting, the "Hispanic or Latino" category is treated as a distinct demographic category. A person who identifies as Hispanic or Latino is counted as Hispanic or Latino, regardless of race.

- The number of facilities represents facilities with a cancer MIR above level indicated. When the MIR was located at a user assigned receptor at an individual residence and not at a census block centroid, we were unable to estimate population and demographics for that facility.
- The sum of individual populations with a demographic category may not add up to total due to rounding. K = Thousands, M = Millions.
- When the population being characterized is very small, the demographic distributions provided by the Census can be subject to a high level of uncertainty. To avoid implying a level of precision that is not supported by the data, when the population of an individual demographic is less than 100, we have indicated it on the demographic tables as <100.

Table 16. Source Category: Comparison of Baseline and Post-Control Demographics of Populations With Cancer Risk Greater Than 100-in-1 Million Resulting From PEPO NESHAP Source Category Emissions Living Within 10 km of Facilities to the National Average and Proximity Demographics

Demographic Group	Nationwide Average for Reference	Proximity Analysis for Total Population Living Within 10 km of PEPO Facilities	Cancer Risk >100-in-1 Million Within 10 km of PEPO Facilities	
			Baseline	Post-Control
Total Population	330M	1.4M	3.3K	0
Number of Facilities	-	23	6	0
Race and Ethnicity by Percent [Number of People]				
White	60%	59%	61%	100%
	[196M]	[847K]	[2K]	[0]
Black	12%	13%	14%	0%
	[40M]	[192K]	[500]	[0]
American Indian and Alaskan Native	0.6%	0.2%	0.0%	0.0%
	[2.1M]	[3.3K]	[0]	[0]
Hispanic or Latino (white and nonwhite)	19%	22%	21%	0%
	[63M]	[320K]	[700]	[0]
Other and Multiracial	9%	5%	5%	0%
	[29M]	[68K]	[100]	[0]
Age By Percent [Number of People]				
Age 0 to 17 years	22%	24%	25%	0%
	[74M]	[345K]	[800]	[0]
Age 18 to 64 years	62%	61%	58%	0%
	[203M]	[876K]	[1.9K]	[0]
Age ≥ 65 years	16%	15%	17%	0%
	[53M]	[210K]	[600]	[0]
Income by Percent [Number of People]				
Below Poverty Level	13%	14%	26%	0%
	[42M]	[196K]	[900]	[0]
	30%	31%	46%	0%

Below 2x Poverty Level	[100M]	[446K]	[1.5k]	[0]
Education by Percent [Number of People]				
Over 25 and without a High School Diploma	12%	14%	30%	0%
	[38M]	[197K]	[1k]	[0]
Linguistically Isolated by Percent [Number of People]				
Linguistically Isolated	5%	4%	1%	0%
	[17M]	[59K]	[<100]	[0]

Notes:

- Nationwide population and demographic percentages are based on Census' 2016–2020 ACS 5-year block group averages. Total population count is based on 2020 Decennial Census block population.
- To avoid double counting, the "Hispanic or Latino" category is treated as a distinct demographic category. A person who identifies as Hispanic or Latino is counted as Hispanic or Latino, regardless of race.
- The number of facilities represents facilities with a cancer MIR above level indicated. When the MIR was located at a user assigned receptor at an individual residence and not at a census block centroid, we were unable to estimate population and demographics for that facility.
- The sum of individual populations with a demographic category may not add up to total due to rounding. K = Thousands, M = Millions.

2. PEPO Production Whole-Facility Demographics

As described in section III.B.7 of this preamble, we assessed the facility-wide (or "whole-facility") risks for 25 PEPO facilities in order to compare the PEPO Production source category risk to the whole-facility risks, accounting for HAP emissions from the entire major source and not just those resulting from PEPO Production source category emissions at the major source as discussed in the previous section (V.F.1). The whole-facility risk analysis includes all sources of HAP emissions at each facility as reported in the NEI (described in section III.B of this preamble). Since PEPO facilities tend to include HAP emissions sources from many source categories, the EPA conducted a whole-facility demographic analysis focused on post-control risks. This whole-facility demographic analysis characterizes the remaining risks that communities would face after implementation of the controls proposed to be required in this proposal (*i.e.*, post-control).

The whole-facility demographic analysis is an assessment of individual demographic groups in the total population living within 10 km (~6.2 miles) and 50 km (~31 miles) of the facilities. In this preamble, we focus on the results from the demographic analyses using a 10 km radius because this area captures the majority of the population with higher cancer risks due to

HAP emissions from PEPO facilities. Specifically, 100 percent of the population with baseline cancer risks greater than or equal to 50-in-1 million from PEPO Production source category emissions lives within 10 km of the PEPO facilities. The results of the whole-facility demographic analysis for populations living within 50 km are included in the document titled *Analysis of Demographic Factors for Populations Living Near Polyether Polyols (PEPO) Production Facilities – Whole Facility Analysis of Proposed Amendments,* which is available in the docket for this rulemaking.

The whole-facility demographic analysis post-control results are shown in table 17 of this preamble. This analysis focused on the populations living within 10 km of the PEPO facilities with estimated whole-facility post-control cancer risks greater than or equal to 1-in-1 million, greater than or equal to 50-in-1 million, and greater than 100-in-1 million. The risk analysis indicated that all emissions from the PEPO facilities, after the reductions proposed to be imposed by the proposed rule, would expose a total of about 1 million people living around 22 facilities to a cancer risk greater than or equal to 1-in-1 million, 13,000 people living around 12 facilities to a cancer risk greater than or equal to 50-in-1 million, and about 200 people living around 1 facility to a cancer risk greater than 100-in-1 million.

When the PEPO whole-facility populations are compared to the PEPO Production source category populations in the post-control scenarios, we see 400,000 additional people with risks greater than or equal to 1-in-1 million, 11,000 additional people with risks greater than or equal to 50-in-1 million, and 200 additional people with risks greater than 100-in-1 million.

The demographic distribution of the whole-facility population with post-control cancer risks greater than or equal to 1-in-1 million is similar to the distribution of the source category population with post-control cancer risks greater than or equal to 1-in-1 million. Therefore, the whole-facility population with post-control cancer risks greater than or equal to 1-in-1 million has disproportionately high representation from Blacks, Hispanics and Latinos, people living

below the poverty level, people living below two times the poverty level, and those over 25 without a high school education.

The population with post-control cancer risks greater than or equal to 50-in-1 million in the whole-facility analysis has a much different demographic distribution than the source category population with post-control cancer risks greater than or equal to 50-in-1 million. The percent of the population that is Black with risks greater than or equal to 50-in-1 million is lower for the whole-facility post-control analysis (9 percent) versus the category post-control analysis (17 percent) and is therefore below the national average (12 percent). The lower representation of the Black population is reflected in slightly higher (1 to 2 percent) greater representation of the other races/ethnicities. As such, the Hispanic and Latino population is still disproportionately represented at 27 percent, which is well above the national average of 19 percent. The percentage of the population with risks greater than or equal to 50-in-1 million that is below the poverty level (8 percent) and below two times the poverty level (21 percent) is about half that for the whole-facility post-control population than for the category post-control population. This means that the whole-facility population is below the national average for both poverty demographics.

Based on results from the whole-facility emissions analysis, there would be about 200 people with post-control risks greater than 100-in-1 million. Earlier in this preamble, we showed that the PEPO Production source category emissions analysis indicated that there would be no people with post-control risks greater than 100-in-1 million. The increased cancer risk for most of these 200 people is driven by EtO emissions from non-PEPO processes (HON, MON, and R&D Testing) co-located at PEPO facilities.

The percent of the population in the whole-facility analysis with post-control risks greater than 100-in-1 million that is Black (26 percent, <100 people) is more than double the national average (12 percent). In addition, the percentages of the population in the whole-facility analysis with a post-control risk greater than 100-in-1 million that are below the poverty level (21 percent, <100 people), below 2 times the poverty level (44 percent, <100 people), and over 25

years old without a high school diploma (25 percent, <100 people) are all above the national average (13 percent, 30 percent and 12 percent, respectively).

Table 17. Whole Facility: Whole-Facility Post-Control Demographics for PEPO Production Facilities by Risk Level for Populations Living Within 10 km of Facilities

Demographic Group	Nationwide	Post-Control Cancer Risk for Populations Within 10 km of PEPO Facilities		
		≥1-in-1 million	≥50-in-1 million	>100-in-1 million
Total Population	329,824,950	1M	13K	200
Number of Facilities	-	22	12	1
Race and Ethnicity by Percent [Number of People]				
White	60%	52%	59%	61%
	[196M]	[520K]	[7.6K]	[<100]
Black	12%	15%	9%	26%
	[40M]	[149K]	[1.2K]	[<100]
American Indian and Alaskan Native	0.6%	0.2%	0.6%	0.0%
	[2.1M]	[2K]	[<100]	[0]
Hispanic or Latino (white and nonwhite)	19%	28%	27%	10%
	[63M]	[282K]	[3.5K]	[<100]
Other and Multiracial	9%	5%	4%	3%
	[29M]	[49K]	[500]	[<100]
Age By Percent [Number of People]				
Age 0 to 17 years	22%	25%	21%	13%
	[74M]	[249K]	[2.7K]	[<100]
Age 18 to 64 years	62%	62%	62%	58%
	[203M]	[616K]	[7.9K]	[<100]
Age ≥ 65 years	16%	14%	17%	29%
	[53M]	[135K]	[2.2K]	[<100]
Income by Percent [Number of People]				
Below Poverty Level	13%	14%	8%	21%
	[42M]	[144K]	[1.1K]	[<100]
Below 2x Poverty Level	30%	32%	21%	44%
	[100M]	[320K]	[2.7K]	[<100]
Education by Percent [Number of People]				
Over 25 and without a High School Diploma	12%	15%	16%	25%
	[38M]	[150K]	[2K]	[<100]
Linguistically Isolated by Percent [Number of People]				
Linguistically Isolated	5%	5%	2%	2%
	[17M]	[53K]	[300]	[<100]

Notes:

- Nationwide population and demographic percentages are based on Census' 2016–2020 ACS 5-year block group averages. Total population count is based on 2020 Decennial Census block population.

- To avoid double counting, the "Hispanic or Latino" category is treated as a distinct demographic category. A person who identifies as Hispanic or Latino is counted as Hispanic or Latino, regardless of race.
- The number of facilities represents facilities with a cancer MIR above level indicated. When the MIR was located at a user assigned receptor at an individual residence and not at a census block centroid, we were unable to estimate population and demographics for that facility.
- The sum of individual populations with a demographic category may not add up to total due to rounding.
- As indicated in the table there is only one facility with an MIR above 100-in-1 million in the whole-facility post-control analysis (75 people). However, emissions of two other facilities (located next to each other) impact one census block and yield additional population above 100-in-1 million (78 people). Thus, 75 + 78 = 153 people with risks greater than 100-in-1 million. In addition, not shown in the table, is a facility where the MIR was located at a cluster of residences with a user assigned receptor and was not located at a census block centroid. Population data are only provided by the Census Bureau at census blocks, therefore, the number of people living at the households was estimated manually and demographic data were not available. We estimate that there are an additional 60 people exposed to risks greater than 100-in-1 million living around this facility, bringing the total to about 200 people for whole-facility risks.
- When the population being characterized is very small, the demographic distributions provided by the Census can be subject to a high level of uncertainty. To avoid implying a level of precision that is not supported by the data, when the population of an individual demographic is less than 100, we have indicated it on the demographic tables as <100.

3. PEPO Production Community Demographics

As described in section III.B.8 of this preamble, we assessed the community-based risks for 25 PEPO facilities in order to compare the PEPO Production source category risk to the community risks. The community risks include HAP emissions from all major stationary sources within 10 km of the PEPO facilities as reported in the NEI (described in section III.B of this preamble). The discussion of the community risk analysis is focused on post-control risks. This community demographic analysis characterizes the remaining risks that communities would face after implementation of the controls proposed to be required in this proposal.

The community demographic analysis is an assessment of individual demographic groups in the total population living within 10 km (~6.2 miles) of the PEPO facilities. The community risk assessment and demographics were only conducted at the 10 km radius because, based on PEPO category emissions, this distance includes 100 percent of the population with cancer risks greater than or equal to 50-in-1 million. The full results of the community demographic analysis are in the document titled *Analysis of Demographic Factors for Populations Living Near Polyether Polyols (PEPO) Production Facilities – Community-Based Assessment,* which is available in the docket for this rulemaking.

The community demographic analysis post-control results are shown in table 18 of this preamble. This analysis focused on the populations living within 10 km of the PEPO facilities with estimated community post-control cancer risks greater than or equal to 1-in-1 million, greater than or equal to 50-in-1 million, and greater than 100-in-1 million. The risk analysis indicated that all emissions from all facilities within 10 km of the PEPO facilities, after the reductions proposed to be imposed by the proposed rule, would expose a total of about 1.1 million people living around 25 facilities to a cancer risk greater than or equal to 1-in-1 million, 66,000 people living around 20 facilities to a cancer risk greater than or equal to 50-in-1 million, and about 500 people living around 8 facilities to a cancer risk greater than 100-in-1 million.

When the PEPO community populations are compared to the PEPO Production source category populations in the post-control scenarios, we see 500,000 additional people with risks greater than or equal to 1-in-1 million, 64,000 additional people with risks greater than or equal to 50-in-1 million, and 500 additional people with risks greater than 100-in-1 million.

The demographic distribution of the community population with cancer risks greater than or equal to 1-in-1 million is very similar to the category population and the whole-facility population with cancer risks greater than or equal to 1-in-1 million in the post-control scenario. Therefore, the community population with post-control cancer risks greater than or equal to 1-in-1 million has disproportionately high representation from Blacks, Hispanics and Latinos, people living below the poverty level, people living below two times the poverty level, and those over 25 without a high school education.

The population with cancer risks greater than or equal to 50-in-1 million in the community analysis has a much different demographic distribution than the source category population with cancer risks greater than or equal to 50-in-1 million in the post-control scenario. The percent of the population that is Black with risks greater than or equal to 50-in-1 million is lower for the community post-control analysis (7 percent) versus the category post-control analysis (17 percent). The lower representation of the Black population is reflected in greater

representation of the other races/ethnicities. In particular, the percent of the population that is Hispanic or Latino is considerably disproportionately represented at 33 percent, which is significantly above the national average of 19 percent. The percentage of the population with risks greater than or equal to 50-in-1 million that is below the poverty level, below two times the poverty level, or over 25 years old without a high school diploma is about half that for the community post-control population than for the category post-control population.

Based on results from the community emissions analysis, there are about 500 people with post-control risks greater than 100-in-1 million. The PEPO Production source category emissions analysis indicated that there are no people with post-control risks greater than 100-in-1 million. The increased cancer risk for most of these 500 people is driven largely by EtO emissions from non-PEPO processes (HON, MON, and R&D Testing) at PEPO facilities and other facilities within 10 km of PEPO facilities.

The percent of the population in the community analysis with post-control risks greater than 100-in-1 million that is Black (16 percent, <100 people) is above the national average (12 percent). The percent of the population in the community analysis with a post-control risk greater than 100-in-1 million that is below the poverty level (12 percent, <100 people) and below 2 times the poverty level (26 percent, 100 people) is below the national average (13 percent and 30 percent, respectively). The percent of the population in the community analysis with a post-control risk greater than 100-in-1 million that is over 25 years old without a high school diploma (16 percent, <100 people) is above the national average (12 percent).

Table 18. Community: Community Post-Control Demographics for PEPO Facilities by Risk Level for Populations Living Within 10 km of Facilities

Demographic Group	Nationwide	Post-Control Cancer Risk for Populations within 10 km of PEPO Facilities		
		≥1-in-1 million	≥50-in-1 million	>100-in-1 million
Total Population	329,824,950	1.1M	66K	500
Number of Facilities	-	25	20	8
Race and Ethnicity by Percent [Number of People]				

White	60%	53%	53%	64%
	[196M]	[611K]	[35K]	[300]
Black	12%	15%	7%	16%
	[40M]	[169K]	[4.8K]	[<100]
American Indian and Alaskan Native	0.6%	0.2%	0.3%	0.0%
	[2.1M]	[2.6K]	[200]	[0]
Hispanic or Latino (white and nonwhite)	19%	27%	33%	19%
	[63M]	[306K]	[22K]	[<100]
Other and Multiracial	9%	5%	6%	2%
	[29M]	[55K]	[4.2K]	[<100]
Age By Percent [Number of People]				
Age 0 to 17 years	22%	25%	25%	22%
	[74M]	[283K]	[16K]	[100]
Age 18 to 64 years	62%	62%	61%	57%
	[203M]	[705K]	[41K]	[300]
Age ≥ 65 years	16%	14%	14%	21%
	[53M]	[156K]	[9.4K]	[100]
Income by Percent [Number of People]				
Below Poverty Level	13%	15%	10%	12%
	[42M]	[175K]	[6.3K]	[<100]
Below 2x Poverty Level	30%	34%	23%	26%
	[100M]	[384K]	[15K]	[100]
Education by Percent [Number of People]				
Over 25 and without a High School Diploma	12%	16%	14%	16%
	[38M]	[183K]	[9K]	[100]
Linguistically Isolated by Percent [Number of People]				
Linguistically Isolated	5%	5%	4%	1%
	[17M]	[57K]	[2.7K]	[<100]

Notes:

- Nationwide population and demographic percentages are based on Census' 2016–2020 ACS 5-year block group averages. Total population count is based on 2020 Decennial Census block population.
- To avoid double counting, the "Hispanic or Latino" category is treated as a distinct demographic category. A person who identifies as Hispanic or Latino is counted as Hispanic or Latino, regardless of race.
- The number of facilities represents facilities with a cancer MIR above level indicated. When the MIR was located at a user assigned receptor at an individual residence and not at a census block centroid, we were unable to estimate population and demographics for that facility.
- The sum of individual populations with a demographic category may not add up to total due to rounding.
- Not shown in the table is a facility where the MIR was located at a cluster of residences with a user assigned receptor and was not located at a census block centroid. Population data are only provided by the Census Bureau at census blocks, therefore, the number of people living at the households was estimated manually and demographic data were not available. We estimate that there are an additional 60 people exposed to risks greater than 100-in-1 million living around this facility, bringing the total to about 600 people for Community risks.
- When the population being characterized is very small, the demographic distributions provided by the Census can be subject to a high level of uncertainty. To avoid implying a level of precision that is not supported by the data, when the population of an individual demographic is less than 100, we have indicated it on the demographic tables as <100.

G. What analysis of children's environmental health did we conduct?

This action proposes to address risk from EtO. In addition, the EPA's Policy on Children's Health[97] also applies to this action. Accordingly, we have evaluated the environmental health or safety effects of EtO emissions and exposures on children.

Because EtO is mutagenic (*i.e.*, it can damage deoxyribonucleic acid, DNA), children are expected to be more susceptible to its harmful effects. To take this into account, as part of the risk assessment in support of this rulemaking, the EPA followed its guidelines[98] and applied age-dependent adjustment factors (ADAF) for childhood exposures (from birth up to 16 years of age). With the ADAF applied to account for greater susceptibility of children, the adjusted EtO inhalation URE is 5×10^{-3} per $\mu g/m^3$. We note that, because EtO is mutagenic, emission reductions proposed in this action would be particularly beneficial to children. The results of the risk assessment are contained in sections IV.A and IV.B of this preamble and further documented in the risk report, *Residual Risk Assessment for the Polyether Polyols (PEPO) Production Source Category in Support of the 2024 Risk and Technology Review Proposed Rule,* which is available in the docket for this rulemaking.

VI. Request for Comments

We solicit comments on this proposed action. In addition to general comments on this proposed action, we are also interested in additional data that may improve the risk assessments and other analyses. We are specifically interested in receiving any information regarding developments in practices, processes, and control technologies that reduce emissions. We are also interested in receiving information on costs, emissions, and product recovery, and we request comment on how to address the non-monetized costs and benefits of the proposed rule.

[97] Children's Health Policy. Available at: *https://www.epa.gov/children/childrens-health-policy-and-plan*.

[98] U.S. EPA. 2005. *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens*. U.S. EPA, Washington, DC, EPA/630/R-03/003F. *https://www.epa.gov/sites/default/files/2013-09/documents/childrens_supplement_final.pdf*.

We request comment on data and approaches to monetize the health benefits of reducing exposure to EtO and other HAP emitted from PEPO sources.

VII. Submitting Data Corrections

The site-specific emissions profiles used in the source category risk and demographic analyses and instructions are available for download on the project website at *https://www.epa.gov/stationary-sources-air-pollution/polyether-polyols-production-national-emission-standards-hazardous*. The data files include detailed information for each HAP emissions release point for the facilities in the source category.

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

1. Within this downloaded file, enter suggested revisions to the data fields appropriate for that information.

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

3. Send the entire downloaded file with suggested revisions and all accompanying documentation to Docket ID No. EPA-HQ-OAR-2023-0282 (through the method described in the **ADDRESSES** section of this preamble).

5. If you are providing comments on a single facility or multiple facilities, you need only submit one file for all facilities. The file should contain all suggested changes for all sources at that facility (or facilities).

VIII. 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 14094: Modernizing Regulatory Review

This action is not a significant regulatory action as defined in Executive Order 12866, as amended by Executive Order 14094, and was therefore not subject to a requirement for Executive Order 12866 review.

B. Paperwork Reduction Act (PRA)

The information collection activities in this proposed rule have been submitted for approval to the OMB under the PRA. The information collection request (ICR) document that the EPA prepared has been assigned EPA ICR number 1811.13. You can find a copy of the ICR in the docket for this rulemaking, and it is briefly summarized here.

In this action, the EPA is proposing to add new monitoring and operational requirements for flares, add work practice standards for startup and shutdown periods for maintenance vents and planned routine maintenance of storage vessels, clarify regulatory provisions for vent control bypasses, add new monitoring requirements for PEPO pressure vessels, add new emission standards for PEPO surge control vessels and bottoms receivers, and add new emission standards for PEPO transfer operations. The EPA is also proposing to require control of EtO emissions from process vents, storage vessels, equipment leaks, heat exchange systems, and wastewater in EtO service. In addition, the EPA is proposing amendments to the PEPO NESHAP that add requirements for electronic reporting of periodic reports and performance test results, add requirements for fenceline monitoring, and make other minor clarifications and corrections. This information will be collected to ensure compliance with the PEPO NESHAP.

Respondents/affected entities: Owners or operators of PEPO production facilities.

Respondent's obligation to respond: Mandatory (40 CFR part 63, subpart PPP).

Estimated number of respondents: 27 (assumes 2 new respondents over the next 3 years).

Frequency of response: Initially, semiannually, and annually.

Total estimated burden: 12,000 hours (per year). Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: Average annual cost is $12,800,000 (per year) which includes $11,600,000 annualized capital or operation & maintenance 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 rulemaking. The EPA will respond to any ICR-related comments in the final rule. You may also send your ICR-related comments to OMB's Office of Information and Regulatory Affairs using the interface at *https://www.reginfo.gov/public/do/PRAMain*. Find this particular information collection by selecting "Currently under Review - Open for Public Comments" or by using the search function. OMB must receive comments no later than **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

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. We identified that one of the 25 facilities in the PEPO Production source category affected by this proposed action is a small business. This facility is subject to the PEPO NESHAP because it receives and treats wastewater from a PEPO production facility. The EIA conducted for this proposal (see *Economic Impact Analysis*, which is available in the docket for this action) showed that this small business will not incur total annualized costs greater than one percent of its revenue.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of $100 million or more (adjusted for inflation) as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. The costs involved in this action are estimated not to exceed $176

million in 2022$ ($100 million in 1995$ adjusted for inflation using the gross domestic product implicit price deflator) or more in any one 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 Sstates, 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 facilities that have been identified as being affected by this action are owned or operated by Tribal governments or are located within 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

Executive Order 13045 directs Federal agencies to include an evaluation of the health and safety effects of the planned regulation on children in Federal health and safety standards and explain why the regulation is preferable to potentially effective and reasonably feasible alternatives. While the environmental health or safety risks addressed by this action present a disproportionate risk to children because EtO is mutagenic (*i.e.*, EtO can damage DNA), this action is not subject to Executive Order 13045 because it is not a significant regulatory action under section 3(f)(1) of Executive Order 12866. However, the EPA's *Policy on Children's Health* applies to this action. Information on how the Policy was applied is available in section V.G of this preamble.

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 proposed action involves technical standards. Therefore, the EPA conducted searches for the PEPO NESHAP through the Enhanced National Standards Systems Network Database managed by the American National Standards Institute (ANSI). We also conducted a review of voluntary consensus standards (VCS) organizations and accessed and searched their databases. We conducted searches for EPA Methods 1, 1A, 2, 2A, 2C, 2D, 2F, 2G, 3B, 4, 18, 21, 22, and 25A of 40 CFR part 60, appendix A, and EPA Methods 301 and 320 of 40 CFR part 63, appendix A. During the EPA's VCS search, if the title or abstract (if provided) of the VCS described technical sampling and analytical procedures that are similar to the EPA's reference method, the EPA ordered a copy of the standard and reviewed it as a potential equivalent method. We reviewed all potential standards to determine the practicality of the VCS for this rulemaking. This review requires significant method validation data that meet the requirements of EPA Method 301 for accepting alternative methods or scientific, engineering, and policy equivalence to procedures in the EPA reference methods. The EPA may reconsider determinations of impracticality when additional information is available for particular VCS.

We did not identify any applicable VCS for EPA Methods 1A, 2A, 2D, 2F, 2G, 21, and 22. However, the EPA is proposing amendments to 40 CFR 63.14 to incorporate by reference the following three VCS: ANSI/ASME PTC 19.10-1981—Part 10, “Flue and Exhaust Gas Analyses” as an acceptable alternative to EPA Method 3B (manual portion only); ASTM D6420-18, “Standard Test Method for Determination of Gaseous Organic Compounds by Direct Interface Gas Chromatography-Mass Spectrometry” as an acceptable alternative to EPA Method 18; and ASTM D6348-12e1, “Determination of Gaseous Compounds by Extractive Direct Interface Fourier Transform (FTIR) Spectroscopy” as an acceptable alternative to EPA Method 320.

ANSI/ASME PTC 19.10-1981—Part 10, “Flue and Exhaust Gas Analyses” quantitatively determines the gaseous constituents of exhausts including oxygen, CO_2, CO, nitrogen, SO_2,

sulfur trioxide, nitric oxide, nitrogen dioxide, hydrogen sulfide, and hydrocarbons. This method incorporates both manual and instrumental methodologies for the determination of oxygen content. The manual method segment of the oxygen determination is performed through the absorption of oxygen. This method is available at the ANSI, 1899 L Street NW, 11th Floor, Washington, DC 20036 and the American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016-5990; telephone number: 1-800-843-5990; and email address: *customercare@asme.org*. See *https://wwww.ansi.org* and *https://www.asme.org*. The standard is available to everyone at a cost determined by ANSI/ASME ($88). ANSI/ASME also offer memberships or subscriptions for reduced costs. The cost of obtaining these methods is not a significant financial burden, making the methods reasonably available.

ASTM D6420-18, "Standard Test Method for Determination of Gaseous Organic Compounds by Direct Interface Gas Chromatography-Mass Spectrometry" uses a direct interface gas chromatograph/mass spectrometer to measure 36 VOC and provide an on-site analysis of extracted, unconditioned, and unsaturated (at the instrument) gas samples from stationary sources. In this action, the EPA is proposing ASTM D6420-18 as an alternative to EPA Method 18 with the following caveats:

- The target compounds are known and are listed in ASTM D6420-18 as measurable.
- ASTM D6420-18 is not used for methane and ethane because the atomic mass is less than 35.
- ASTM D6420-18 is never specified as a total VOC method.

ASTM D6348-12e1, "Standard Test Method for Determination of Gaseous Compounds by Extractive Direct Interface Fourier Transform (FTIR) Spectroscopy" is an extractive FTIR spectroscopy-based field test method and is used to quantify gas phase concentrations of multiple target compounds in emissions streams from stationary sources. When using ASTM D6348-12e1, the EPA proposes the following conditions: (1) The test plan preparation and implementation in the Annexes to ASTM D6348-03 sections Al through A8 are mandatory; and

(2) in Annex A5 (Analyte Spiking Technique) to ASTM D6348-103, the owner or operator must determine the percent (%) R for each target analyte (Equation A5.5). For the test data to be acceptable for a compound, %R must be 70% ≥ R ≤ 130%. If the %R value does not meet this criterion for a target compound, the test data is not acceptable for that compound and the owner or operator must repeat the test for that analyte (*i.e.*, the sampling and/or analytical procedure should be adjusted before a retest). We are proposing that owners or operators must report the %R value for each compound 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.

ASTM D6420-18 and ASTM D6348-12e1 are available at ASTM International, 1850 M Street NW, Suite 1030, Washington, DC 20036. See *https://www.astm.org/*. These standards are available to everyone at a cost determined by the ASTM ($63 and $83, respectively). The ASTM also offers memberships or subscriptions that allow unlimited access to their methods. The cost of obtaining these methods is not a significant financial burden, making the methods reasonably available to stakeholders.

The search identified 11 VCS that were potentially applicable for this rulemaking in lieu of EPA reference methods. After reviewing the available standards, the EPA determined that the 11 candidate VCS (ASTM D3154-00 (2006), ASTM D3464-96 (2007), ASTM 3796-90 (2004), ISO 10780:1994, ASME B133.9-1994 (2001), ANSI/ASME PTC 19-10-198-Part 10, NIOSH Method 2010 "Amines, Aliphatic," ASTM D6060-96 (2009), ISO 14965:2000(E), EN 12619 (1999), ASTM D4855-97 (2002)) identified for measuring emissions of pollutants or their surrogates subject to emission standards in the rule would not be practical due to lack of equivalency, documentation, and validation data, and due to other important technical and policy considerations. The EPA documented the search and review results in the memorandum, *Voluntary Consensus Standard Results for National Emission Standards for Hazardous Air Pollutants: Polyether Polyols Production Industry Residual Risk and Technology Review*, which

is available in the docket for this action. The EPA welcomes comments on this aspect of the proposed rulemaking and, specifically, invites the public to identify potentially applicable VCS and to explain why such standards should be used in this regulation.

Under 40 CFR 63.7(f) and 63.8(f), subpart A—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.

J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations and Executive Order 14096: Revitalizing Our Nation's Commitment to Environmental Justice for All

The EPA believes that the human health or environmental conditions that exist prior to this action result in or have the potential to result in disproportionate and adverse human health or environmental effects on communities with EJ concerns. For the PEPO NESHAP, a total of approximately 1.5 million people live within 10 km of the 25 PEPO facilities that were assessed for risk. Based on the whole-facility proximity analysis summarized in section V.F of this preamble, the percentages of the population that are Black (13 percent versus 12 percent) and Hispanic or Latino (22 percent versus 19 percent) are higher than the national averages. In addition, the percentages of the population that are below the poverty level (14 percent versus 12 percent), below two times the poverty level (32 percent versus 30 percent), and over 25 years of age without a high school diploma (14 percent versus 12 percent) are higher than the national averages. The proportions of other demographic groups living within 10 km of PEPO facilities are lower than the national average. The EPA also conducted a risk assessment of possible cancer risks and other adverse health effects and found that prior to this proposed regulation, cancer risks for the PEPO Production source category were above acceptable levels for a number of areas in which these demographic groups live. See section V.F of this preamble for an analysis

that characterizes populations living in proximity to facilities and risks prior to the proposed regulation.

The EPA believes that this proposed action is likely to reduce existing disproportionate and adverse effects on communities with EJ concerns. This action would establish standards for EtO emission sources at PEPO processes (*i.e.*, process vents, storage vessels, heat exchange systems, equipment leaks, and wastewater). This action proposes to require fenceline monitoring for EtO, which drives cancer risks for PEPO production sources, and proposes to address flare combustion efficiency. The EPA is also proposing that fenceline monitoring data be reported electronically to the EPA so that it can be made public and provide fenceline communities with greater access to information about potential emissions impacts.

As a result of these proposed changes, we expect zero people to be exposed to risk levels above 100-in-1 million due to emissions from the source category. See sections IV.A and IV.B of this preamble for more information about the control requirements of the regulation and the resulting reduction in cancer risks. Also, see section V.F of this preamble for an analysis that characterizes populations living in proximity to facilities after implementation of the proposed regulation (post-control).

The information supporting this Executive order review is contained in section V.F of this preamble, as well as in the technical reports, *Analysis of Demographic Factors for Populations Living Near Polyether Polyols (PEPO) Production Facilities – Source Category Analysis of Proposed Amendments*, *Analysis of Demographic Factors for Populations Living Near Polyether Polyols (PEPO) Production Facilities – Whole Facility Analysis of Proposed Amendments*, and *Analysis of Demographic Factors for Populations Living Near Polyether Polyols (PEPO) Production Facilities – Community-Based Assessment,* which are available in the docket for this action.

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.

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