U.S. Environmental Protection Agency

Asbestos Part 2: Supplemental Evaluation Including Legacy Uses and Associated Disposals of Asbestos; Regulation Under the Toxic Substances Control Act (TSCA)

EPA–HQ–OPPT–2021–0254

Comment Summary and Responses

November 2024

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Table of Contents

Introduction vii
Table 1: Index of Comment Submissions on the Asbestos Part 2 Draft Risk Evaluation 1
Section 1: Overarching Comments on Scope of the Risk Assessment 2
1.1 Definition of Asbestos for the Risk Evaluation 2
1.1.1 Asbestos Fiber Types 2
1.1.2 Talc Containing Asbestos 2
1.1.3 Libby Amphibole Asbestos 5
1.2 Conditions of Use 5
1.2.1 General Comments on Conditions of Use 6
1.2.2 Comments On Specific Conditions Of Use 7
Section 2: Chemistry, Fate, and Transport of Asbestos 8
Section 3 Release and Concentrations of Asbestos 9
Section 4 Environmental Risk Assessment 9
Section 5 Human Exposure 10
5.1 Occupational Exposure 10
5.1.1 General Comments on Occupational Exposure 10
5.1.2 Personal Protective Equipment and Engineering Controls 15
5.1.3 Disaster Response 16
5.2 Indoor Dust in Schools and Other Public Buildings 18
5.3 Take Home Exposure 20
5.4 General Population Exposures 21
5.6 Bystander Exposure 23
5.7 Aggregate Exposure to Asbestos 23
5.8 Other Comments on Exposure 24
5.9 Susceptible Subpopulations 26
Section 6 Human Health Hazard 28
6.1 Cancer Hazard 28
6.2 Non-cancer Hazard 31
6.3 General Comments on Hazard 32
Section 7 Human Health Risk Characterization 34
Section 8 Unreasonable Risk Determination 35
Section 9 Systematic Review 38
Section 10 Other Comments 43

10.1 Mining 43
10.2 Building Surveys 43
10.3 Peer Review and Public Engagement 44
10.4 Organization of the Risk Evaluation 45
10.5 Other Comments 46
Section 11 Out of Scope Comments 49
11.1 Comments on Asbestos Part 1 RE or the White Paper Letter Peer Review 49
11.2 Current Regulations 49
11.3 Risk Management 49
11.4 Other Out of Scope Comments 51

Acronyms and Abbreviations

ACM	Asbestos-containing material(s)
AHERA	Asbestos Hazard Emergency Response Act
ATSDR	Agency for Toxic Substances and Disease Registry
BLS	Bureau of Labor Statistics
CASRN	Chemical Abstracts Service Registry Number
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
DIY	Do-it-yourself
ECEL	Existing chemical exposure limit
EPA	Environmental Protection Agency
FDA	Food and Drug Administration
FFDCA	Federal Food, Drug, and Cosmetic Act
IARC	International Agency for Research on Cancer
IRIS	Integrated Risk Information System
IUR	Inhalation unit risk
LAA	Libby Amphibole Asbestos
LOD	Limit of detection
MCL	Maximum Contaminant Level
MSHA	Mine Safety and Health Administration
NAICS	North American Industry Classification System
NEI	National Emissions Inventory
NESHAP	National Emission Standards for Hazardous Air Pollutants
NIOSH	National Institute for Occupational Safety and Health
NRC	National Response Center
OAQPS	Office of Air Quality Planning and Standards
OEL	Occupational exposure limit
OES	Occupational exposure scenario
OEV	Occupational exposure value
ONU	Occupational non-user
OPPT	Office of Pollution Prevention and Toxics
OSHA	Occupational Safety and Health Administration
PBZ	Personal breathing zone
PCM	Phase contrast microscopy
PESS	Potentially exposed or susceptible subpopulations
PLM	Polarized light microscopy
POD	Point of departure
PPE	Personal protective equipment
RCRA	Resource Conservation and Recovery Act
RfC	Reference Concentration
SOC	Standard Occupational Classification
SUSB	Statistics of U.S. Businesses (U.S. Census)
TEM	Transmission electron microscopy
TRI	Toxics Release Inventory
TSCA	Toxic Substances Control Act
TWA	Time-weighted average

U.S.	United States
WHO	World Health Organization

Introduction

On April 16, 2024, the U.S. Environmental Protection Agency (EPA) published the *2024 Draft Risk Evaluation for Asbestos Part 2: Supplemental Evaluation Including Legacy Uses and Associated Disposals of Asbestos* and accepted public comment until June 17, 2024. Materials on the draft risk evaluation are available at www.regulations.gov in docket EPA-HQ-OPPT-2021-0254. In addition, on May 13, 2024, EPA hosted a public webinar providing an overview of the risk evaluation.

This document summarizes the public received for the risk evaluation of Asbestos Part 2. The EPA Office of Pollution Prevention and Toxics (OPPT) appreciates the valuable input provided by the public. The input resulted in numerous revisions to the risk evaluation document. The public comments are categorized by the nine themes listed below.

Additionally, within each theme comments that cover similar issues are presented together.

1. Overarching Comments on the Scope of the Risk Evaluation
2. Chemistry, Fate, and Transport of Asbestos
3. Releases and Concentrations of Asbestos
4. Environmental Risk Assessment
5. Human Exposure
6. Human Health Hazard
7. Human Health Risk Characterization
8. Unreasonable Risk Determination
9. Systematic Review
10. Other Comments
11. Out of Scope Comments

The draft risk evaluation is based on a quantitative approach for the human health assessment that was published for peer review in August 2023. The White Paper: Quantitative Human Health Approach to be Applied in the Risk Evaluation for Asbestos Part 2 – Supplemental Evaluation including Legacy Uses and Associated Disposal of Asbestos was released for letter peer review and public comment. And the peer review comments were posted on December 28, 2023 (EPA-HQ-OPPT-2023-0309-0020). Responses to the peer reviewers and public comments are in a separate document.

Table 1: Index of Comment Submissions on the Asbestos Part 2 Draft Risk Evaluation

Submission Number	Commenter Name
EPA-HQ-OPPT-2021-0254-0050	American Chemistry Council (ACC)
EPA-HQ-OPPT-2021-0254-0051	Sid Hawkins
EPA-HQ-OPPT-2021-0254-0052	Asbestos Disease Awareness Organization (ADAO)
EPA-HQ-OPPT-2021-0254-0053	Asbestos Disease Awareness Organization (ADAO)
EPA-HQ-OPPT-2021-0254-0056	The Vermiculite Association (TVA)
EPA-HQ-OPPT-2021-0254-0057	Anonymous Public Comment
EPA-HQ-OPPT-2021-0254-0058	Timothy Keane
EPA-HQ-OPPT-2021-0254-0059	Savannah River Nuclear Solutions, LLC (SRNS)
EPA-HQ-OPPT-2021-0254-0060	American Public Health Association (APHA)
EPA-HQ-OPPT-2021-0254-0061	American Lung Association
EPA-HQ-OPPT-2021-0254-0062	Steven Compton, MVA Scientific Consultants
EPA-HQ-OPPT-2021-0254-0063	Future Environmental Designs, Inc. (FED)
EPA-HQ-OPPT-2021-0254-0064	Donald & Barbara Zucher School of Medicine at of Medicine at Hofstra University/Northwell Health
EPA-HQ-OPPT-2021-0254-0065	W. R. Grace & Co.
EPA-HQ-OPPT-2021-0254-0066	American Water Works Association (AWWA)
EPA-HQ-OPPT-2021-0254-0067	American Association for Justice (AAJ)
EPA-HQ-OPPT-2021-0254-0068	Environmental Protection Network (EPN)
EPA-HQ-OPPT-2021-0254-0069	American Federation of State, County and Municipal Employees (AFSCME)
EPA-HQ-OPPT-2021-0254-0070	Essential Minerals Association
EPA-HQ-OPPT-2021-0254-0071	Asbestos Disease Awareness Organization (ADAO) submission on behalf of L. Christine Oliver MD, MPH, MS, FACPM
EPA-HQ-OPPT-2021-0254-0072	American Chemistry Council (ACC)
EPA-HQ-OPPT-2021-0254-0073	American Federation of Labor and Congress of Industrial Organizations (AFL-CIO) et al.
EPA-HQ-OPPT-2021-0254-0074	The Environmental Information Association (EIA)
EPA-HQ-OPPT-2021-0254-0075	Asbestos Disease Awareness Organization (ADAO)
EPA-HQ-OPPT-2021-0254-0076	Asbestos Disease Awareness Organization (ADAO)
EPA-HQ-OPPT-2021-0254-0077	Asbestos Disease Awareness Organization (ADAO) submission on behalf of Steven Markowitz, MD
EPA-HQ-OPPT-2021-0254-0078	American Petroleum Institute (API)
EPA-HQ-OPPT-2021-0254-0079	Nuclear Energy Institute (NEI)
EPA-HQ-OPPT-2021-0254-0080	American Public Health Association (APHA)
EPA-HQ-OPPT-2021-0254-0081	National Education Association (NEA)
EPA-HQ-OPPT-2021-0254-0082	Asbestos Disease Awareness Organization (ADAO)
EPA-HQ-OPPT-2021-0254-0083	Asbestos Disease Awareness Organization (ADAO)
EPA-HQ-OPPT-2021-0254-0084	American Association for Justice (AAJ)

Section 1: Overarching Comments on Scope of the Risk Assessment

1.1 Definition of Asbestos for the Risk Evaluation

1.1.1 Asbestos Fiber Types

Summary: Three commenters (0067, 0082, 0081) expressed support for EPA's decision to consider combined risk of all asbestos fiber types in the part 2 asbestos risk evaluation, referencing the recommendation from the 2008 EPA Scientific Advisory Board (SAB) review of asbestos as support for this.

> **EPA Response:** The final asbestos part 2 risk evaluation included evaluation of the asbestiform varieties of six fiber types – chrysotile (serpentine), crocidolite (riebeckite), amosite (cummingtonite-grunerite), anthophyllite, tremolite, or actinolite. Libby Amphibole Asbestos (and its tremolite, winchite, and richterite constituents) were also considered in the Part 2 asbestos risk evaluation. The Agency also considered asbestos-containing talc conditions of use that fall under TSCA authority. This broader definition of asbestos is within the scope of the risk evaluation for legacy uses of asbestos and associated disposals.

1.1.2 Talc Containing Asbestos

Summary: A commenter submitted a copy of a comment submitted on the Asbestos Part 1 Risk Evaluation that was submitted requesting asbestos containing talc be considered as part of the risk evaluation. The comment points to documentation of asbestos in a variety of personal care products and cosmetics, other consumer products, and the broad industrial use of talc in plastics, ceramics, paints, paper, and roofing materials. The commenter states that the extent to which industrial talc contains asbestos is not known, but typically industrial-grade talc undergoes less extensive processing than talc used in personal care products and is more likely to contain impurities.

A commenter (0069) expressed support for including asbestos containing talc in the risk evaluation, due to presence in older building materials.

A commenter (0070) requested EPA verify for the record that talc is not the subject of the risk evaluation.

A commenter (0082) stated that the dismissal of the presence of asbestos in talc is irresponsible and ignores extensive evidence of the risks to consumers and workers from asbestos contaminated talc. The commenter stated that asbestos contaminated with talc has historically been a central issue in media and litigation. The commenter also emphasized that the SACC stated the importance of contaminated talc as an exposure pathway for asbestos.

A commenter (0064) offered references on asbestos exposure with cosmetic talc.

A commenter (0070) submits that the statement "use of cosmetic talk powder can increase susceptibility" in Table 5-26 is outside the scope of the RE.

A commenter (0082) stated that the EPA failed to take into account peer-reviewed studies that have demonstrated that there is asbestos in consumer products, such as cosmetic talc. The commenter then provided a list of peer-reviewed studies with uses that the commenter considers subject to TSCA.

EPA Response: In this part 2 asbestos risk evaluation, EPA considered relevant uses of imported talc products that may contain asbestos (*i.e.*, fillers and putties with talc containing asbestos and crayons with talc containing asbestos), as identified within the scope document for the risk evaluation. Regarding occupational exposures, EPA states in the risk evaluation that asbestos may be contained in articles or formulations such as fillers, including talc containing asbestos fillers. This use is covered under the occupational exposure scenario (OES) for handling articles or formulations that contain asbestos. Data available to characterize the import of talc containing asbestos as stated in the risk evaluation received under the one-time reporting rule under TSCA Section 8(a) were considered in this final risk evaluation. The Agency did not assess exposures from asbestos unintentionally present in trace amounts in products that are not subject to TSCA, such as personal care products with talc containing asbestos.

Exposure to cosmetic asbestos containing talc was noted to potentially impact susceptibility and was considered as potential background exposure in the aggregate analysis (Table 5-26). The EPA would like to clarify, however, that talc-containing cosmetics are outside the scope of TSCA. TSCA sec. 3(2) excludes from the definition of "chemical substance" cosmetics as they are defined in the Federal Food, Drug and Cosmetic Act (FFDCA) when manufactured, processed, or distributed in commerce for use as a cosmetic. Cosmetics are defined in 201(i) as articles, other than soap, intended for cleansing, beautifying, promoting attractiveness, or altering appearance. Therefore, the Agency did not assess exposures from asbestos unintentionally present in trace amounts in products that are not subject to TSCA, such as personal care products with talc containing asbestos.

Summary: A commenter (0064) stated that the EPA consideration of talc is insufficient, because talc is commonly associated with asbestos, asbestos cannot be reliably detected in talc through common industry and can be mixed at scales not observable to the unaided eye. The commenter disagrees with EPA's assertion that selective mining is possible.

Another commenter (0082) stated that there is no reliable means to selectively mine to avoid all asbestos given the mineralogy, inadequate basic analytical techniques used in industry, the limitations of the human eye, and the physical nature of talc ore, and therefore, EPA's claim that selective mining practices occur and are successful in generally avoiding deposits that are likely to contain asbestos minerals by the EPA is not defensible.

EPA Response: EPA acknowledges that selective mining practices can still result in trace amounts of asbestos in mined materials, including talc. The Agency conducted a qualitative analysis of mining based on recent data collected from Mine Safety and Health Administration (MSHA) to determine that mining does not contribute to unreasonable risk.

In the part 2 asbestos risk evaluation, EPA also considered relevant uses of imported talc products that may contain asbestos (*i.e.*, fillers and putties with talc containing asbestos and crayons with talc containing asbestos). The occupational and consumer exposure scenarios used available emissions data during the modification of asbestos containing products including fillers and putties and crayons, therefore any talc containing asbestos for these products were evaluated. Therefore, the risk evaluation evaluated and is protective of risk from talc containing asbestos. The Agency did not assess exposures from asbestos unintentionally present in trace amounts

in products that are not subject to TSCA, such as personal care products with talc containing asbestos.

Summary: A commenter (0070) requests references be added for statements on talc-contaminated asbestos fillers or those statements removed. Specifically, they note no references for the statement in the draft risk evaluation that: "Asbestos may be contained in articles or formulations such as plastics, joints and packings, and fillers (including talc containing asbestos fillers) that were manufactured before the 1980s." and "Workers may come into contact with friable asbestos while handling articles or formulations such as plastic, joints and packings, and fillers (including talc containing asbestos fillers) that contain asbestos."

EPA Response: The EPA utilized established best practices in exposure assessment to evaluate talc containing asbestos fillers. It is widely accepted that filler products may contain talc and that talc may be contaminated with asbestos, especially in legacy products. Therefore, the use of generic occupational exposure scenarios for fillers is appropriate to assess exposure and risk of talc containing asbestos fillers.

Summary: A commenter (0082) stated that EPA makes no mention of the extensive documentation of the adverse health impacts of asbestos in talc, despite the detailed discussion of this evidence in previous public comments submitted. The commenter summarized the key points stating that there are reports of talc miners in New York dying from lung scarring, cancers of the lung, and pleura. The commenter also detailed an epidemiology study sponsored by R.T. Vanderbilt Company that found two cases among 782 white men of talc miners diagnosed with mesothelioma between 1948-1989 who had been employed for at least one day. The commenter also cited Finkelstein's update of Honda that "found [t]here were at least five new cases of mesothelioma in the cohort and mesothelioma incidence rates were at least five (1.6-11.7) times the rate in the general population." The commenter (0082) additionally cited a study from Death Valley that determined talc to contain 5-15% (by volume) tremolite/ actinolite by polarized light microscopy (PLM). Other documentation by the Food and Drug Administration (FDA), and the removal of a talc containing product by a company was also cited to emphasize that asbestos can be found in talc products.

The same commenter (0082) cited two reports linking the use of talcum powder to exposure to asbestos and mesothelioma, and ovarian cancer.

EPA Response: The Part 2 risk evaluation is protective of uses of talc containing asbestos. The health effects associated with exposure to asbestos (including asbestos present in talc), including mesothelioma and ovarian cancer, are characterized in the risk evaluation based on literature that were identified as relevant and of sufficient quality through the systematic review process.

The Moline et al 2019 reference evaluating cosmetic talc and mesothelioma provided by the commenter was captured during systematic review of Part 1. The Kadry et al 2019 meta-analysis of talc powder and ovarian cancer was not captured during systematic review but was reviewed due to this public comment. Neither reference met the criteria for consideration in the dose-response analysis.

Summary: A commenter (0082) disagreed with EPA's claim that there was no reasonably available information identified to provide evidence that import of talc products is ongoing. The commenter cited a previous comment on the Part 1 evaluation with various uses of imported talc sourced from geology.com and emphasized that the extent to which this talc contains asbestos is unknown but that typically industrial-grade talc undergoes less extensive processing than talc used in personal care products and is more likely to contain impurities, and that therefore, the risk should be addressed by EPA in Part 2 asbestos risk evaluation.

> **EPA Response:** The EPA maintains that all reasonably available information on the import of talc products was considered in the Part 2 risk evaluation. EPA utilized recent data on the import of talc containing asbestos received under the one-time reporting rule under TSCA Section 8(a) in this final risk evaluation. A systematic review process was used to ensure that relevant and quality data sources were used to support the risk evaluation. The Agency did not assess exposures from asbestos unintentionally present in trace amounts in products that are not subject to TSCA, such as personal care products with talc containing asbestos.

1.1.3 Libby Amphibole Asbestos

Summary: A commenter (0069) expressed support for including of Libby Amphibole Asbestos (LAA) and asbestos containing talc in the risk evaluation, due to presence in older building materials.

In contrast, A commenter (0065) states that EPA should not consider LAA in the part 2 risk evaluation for several reasons. First, the commenter noted that these materials are not included in the definition of "asbestos" in TSCA § 202(3) and that EPA has not provided adequate rationale for its deviation from the TSCA § 202(3) definition of "asbestos." The commenter also asserted that because EPA did not include winchite or richterite among the initial ten risk evaluation substances, it has not designated them as high-priority substances, and no manufacturer of those minerals has asked EPA to conduct a risk evaluation of them, EPA has not followed the procedures in TSCA § 6(b) and its own regulations for evaluating these substances.

> **EPA Response:** EPA has previously clarified in the RTC for the final scope of asbestos Part 2 that it is EPA's judgement that it is necessary and appropriate to include Libby Amphibole Asbestos (with tremolite, winchite, and richterite constituents) in Part 2 of the Risk Evaluation because of the consideration of legacy uses, primarily for asbestos-containing building materials, where vermiculite from the Libby, MT mine had widespread use. While EPA initially adopted the Asbestos Hazard Emergency Response Act (AHERA) Title II definition for Part 1 of the Risk Evaluation for Asbestos when developing an evaluation of chrysotile asbestos, a broader definition is more appropriate for legacy uses in Part 2. As EPA noted in the earlier RTC, winchite and richterite were not considered beyond Libby Amphibole Asbestos.
>
> Additionally, the inclusion of LAA is consistent with the identification of "asbestos" as the chemical substance subject to the risk evaluation in the December 2016 notice designating the first ten chemical substances subject to risk evaluations under TSCA (81 FR 91927).

1.2 Conditions of Use

1.2.1 General Comments on Conditions of Use

Summary: A commenter (0072) commented that the Agency should thoroughly evaluate existing regulations related to asbestos in order to inform the conditions of use better. These commenters noted that the risk evaluation includes conditions of use that are already regulated under other statutes and regulations. The commenter also noted that although EPA considered various federal, state, and international laws such as the National Emission Standards for Hazardous Air Pollutants, Asbestos Hazard Emergency Response Act, and Occupational Safety and Health programs as well as state level regulations, the Agency has not acknowledged that all 50 states have additional asbestos requirements in place including asbestos abatement activities being conducted by state-certified workers, who are required to comply with asbestos regulations. The commenter believes that EPA's disregard of industrial practices results in a draft risk evaluation that overstates exposure by orders of magnitude and makes erroneous errors about risk.

> **EPA Response:** Existing federal, state, and local asbestos regulatory requirements include work practices that reduce the release of asbestos fibers and therefore may reduce exposure. However, those requirements do not apply to all work situations and EPA's high-end estimates cover those situations where existing regulations do not apply. Existing regulations, while assumed to be effective at reducing exposure, do not cover all activities considered in this draft risk evaluation. EPA focused on the high-end risk estimates to represent situations where workers, including people hired to perform home renovation work or do-it-yourself home renovators, may not be subject to existing asbestos regulatory requirements or do not follow work practices to reduce asbestos exposure. While EPA acknowledges that existing federal, state, and local asbestos regulations may reduce asbestos exposure (and EPA's subsequent risk management action on asbestos may reflect these practices), the risk evaluation assumed that these are not followed consistently in order to be protective of all uses. The risk characterization includes description of how use of personal protective equipment (PPE) and engineering controls that may be utilized to comply with existing regulations may reduce asbestos exposure to support future risk management.

Summary: A commenter (0072) commented that the Agency should apply tiered, screening approaches to determine which legacy uses and disposals present the greatest risk for risk. This commenter believes that as part of the 2019 decision of the U.S. Court of Appeals for the Ninth Circuit in *Safer Chemicals Healthy Families v. EPA* that the EPA was granted discretion to determine the conditions of use for asbestos within the boundary of the statutory definition of "condition of use" and there was no specific ruling or determination on whether EPA has discretion to exclude conditions of use from the scope of the risk evaluation. The commenter further states that because of this ruling the Agency should develop and apply a transparent approach that applies tiering, screening approaches to determine the conditions of use that present the greatest risk and focus resources on evaluation of those.

The same commenter (0072) noted that the Agency needs to use a tiered approach to assess human health exposures. The commenter believes that without a tiered approach the Agency will overestimate the values and lead to an overuse of resources to respond to an exposure or risk that is not present at the level currently being estimated.

> **EPA Response:** The high-end, central-tendency, and low-end exposure scenarios include a range of input parameters and considerations, such as use frequencies, durations of use, and exposure

times. However, the lack of monitoring data for specific activities and fiber releases constrains the ability to further refine scenarios using a tiered approach when risk is identified.

1.2.2 Comments On Specific Conditions Of Use

Summary: A commenter (0067) requested clarity on whether brakes and other friction products are covered by the Part 2 risk evaluation. They noted that current uses of imported asbestos brakes are included in the Part 1 risk evaluation. In Table 6.1, brakes are listed as a COU posing an unreasonable risk, but in Tables 5.2.1 and 5.23, brakes are not mentioned and the COU is labeled as not posing an unreasonable risk. They urged EPA to clarify whether exposure to asbestos from brake and other friction products—either as a mechanic or do-it-yourselfer— is included in the risk assessment.

> **EPA Response:** Aftermarket automotive brakes/lining and other vehicle friction products were assessed by EPA in the 2020 Risk Evaluation for Asbestos, Part 1: Chrysotile Asbestos and subsequently part of EPA's risk management action for chrysotile asbestos. The Agency is now making a single unreasonable risk determination for asbestos as a chemical substance that includes both the conditions of use evaluated in the 2020 Risk Evaluation for Asbestos, Part 1: Chrysotile Asbestos and the conditions of use evaluated in this risk evaluation for Part 2: Supplemental Evaluation Including Legacy Uses and Associated Disposals. The unreasonable risk determination is based on the existing risk characterization section of the 2020 Risk Evaluation, Part 1: Chrysotile Asbestos and does not involve additional technical or scientific analysis. For those COUs assessed in the 2020 Risk Evaluation for Asbestos, Part 1: Chrysotile Asbestos, including aftermarket automotive brakes/lining and other vehicle friction products, EPA does not intend to amend, nor does a single risk determination on the chemical substance require, amending the underlying scientific analysis and the risk characterization.

Summary: A commenter (0072) commented that for disposal, the Occupational Safety and Health Administration (OSHA) requires that asbestos waste, scrap, debris, bags, containers, equipment, and contaminated clothing consigned for disposal to be collected and disposed of in sealed, labeled, impenetrable bags or otherwise closed, labeled, and impenetrable containers. The commenter believes that the Agency ignored these requirements for the disposal of gaskets.

> **EPA Response:** Existing OSHA regulations for disposal of asbestos waste, including disposal of asbestos gaskets, while assumed to be effective at reducing exposure, do not cover all activities considered in this draft risk evaluation. Those requirements do not apply to all work situations and EPA's high-end estimates cover those situations where existing regulations do not apply EPA focused on the high-end risk estimates to represent situations where workers, including people hired to perform home renovation work or do-it-yourself home renovators, may not be subject to existing asbestos regulatory requirements or follow work practices to reduce asbestos exposure. EPA's risk evaluation showed that there are situations where workers, including self-employed persons hired to perform home renovation work, may not be subject to existing asbestos regulatory requirements, or do not follow work practices to reduce asbestos exposure, or may not be aware that asbestos is present at the worksite. Though there are existing OSHA regulations regarding asbestos, EPA does not assume compliance with these regulations for making unreasonable risk determinations. EPA will also not consider exposure reduction based on

assumed use of personal protective equipment as part of the risk determination for conditions of use including disposal of industrial gaskets. Mitigation strategies such as those outlined by the commenter can be considered in the risk management phase.

Summary: A commenter (0082) stated that the disposal activities falling within the COU of *Disposal – distribution for disposal* that contribute to unreasonable risk are not well defined and expressed that this can create uncertainty about the scope of risk management necessary for legacy asbestos disposal. The commenter also added that the EPA did not address whether releases from disposal sites contribute to unreasonable risk to the general population.

EPA Response: Distribution for disposal was removed from the final risk evaluation, as uses evaluating disturbance of asbestos and disposal were considered protective of this activity. All identified products and articles for each COU in this assessment contribute to the released asbestos fibers used in the disposal COU evaluation. EPA agrees that the relative contribution of each COU to the disposal releases used are not apportioned in this assessment. However, the evaluation targeted the exposures to the general population from disposal releases regardless of which COU or product type contributed to the released fiber concentration. The description of the approaches and data used in the evaluation of exposures to releases from disposal activities is available in Appendix G4 and G16, while the exposures to the general the general population from disposal activity releases are discussed in Section 5.1.4 and Appendix N. In the final risk evaluation, EPA did not find that releases from disposal sites (including distribution for disposal) significantly contributed to the unreasonable risk of asbestos to the general population.

Section 2: Chemistry, Fate, and Transport of Asbestos

Summary: A commenter (0070) requested that EPA identify the 6 regulated varieties of asbestos fibers by CASRN, providing a list from the scope, and requested that EPA provide dimensions for anthophyllite and tremolite in Table 2-1.

EPA Response: The generic CASRN for asbestos (1332-21-4) is most appropriate for this risk evaluation. The assignment of CASRN to fiber types does not take into account the morphology of fiber types and thus is not sufficiently descriptive of whether that fiber is asbestiform. Therefore, to avoid confusion, the CASRNs for individual fibers have not been referenced in the final RE. The fiber dimensions were not captured in the systematic review of physical chemistry properties for these fiber types, thus not included in Table 2-1.

Summary: A commenter (0060) asked EPA to clarify that "thermal destruction" refers to industrial incineration, not structural fires or wildfires.

A commenter (0082) expressed concern over EPA's determination that there are very low to non-detectable concentrations of asbestos fibers released during incineration as EPA relied on a single report that did not account for all of the asbestos that goes into incinerators, where combustion temperatures are not uniform, and where asbestos can pass through and be released into the air unaltered. The commenter urged EPA clarify that it is not suggesting that incineration is a safe disposal method for asbestos waste in

all instances, and that asbestos-containing materials are not destroyed during structural fires or other high-temperature conditions.

> **EPA Response:** Clarification has been added to the physical chemistry and fate section of the risk assessment to replace the term "thermal destruction" with "industrial incineration" to avoid confusion that asbestos would be destroyed during structural fires. The EPA does not define industrial incineration as a safe disposal method for asbestos disposal.

Section 3 Release and Concentrations of Asbestos

Summary: A commenter (0066) noted EPA did not find sufficient information to evaluate asbestos in water and recommended that this information be highlighted in the executive summary. The comment recommended several databases for water monitoring data. The commenter stated that the description of analysis of asbestos cement pipes and occupational exposure to water supply and irrigation were not clear, then noted that construction and demolition activities are not reflective of typical use.

> **EPA Response:** As stated in the introduction of the risk evaluation, the EPA did not identify any cancer or non-cancer oral studies to support dose-response analysis of oral exposure to asbestos through ingestion (oral exposure) of drinking water. The risk evaluation is protective of asbestos exposure from asbestos cement pipes used in water supply or irrigation. The risks from asbestos evaluated in this assessment stem from disturbing asbestos either through direct modification or proximity to the activity or associated materials, which is why disruption of an asbestos lined cement pipe during construction or demolition would be a relevant occupational exposure scenario, but typical use would not be anticipated to result in asbestos exposure.

Summary: A commenter (0070) provided references for soil contamination for Appendix F.

> **EPA Response:** EPA appreciates the citations on soil contamination, which were reviewed and incorporated into the risk evaluation as appropriate. EPA included Gunter 2018 in Section 3.3.4, which summarizes soil data identified and used rationale, to further support a statement about the large variability distribution in U.S. asbestos fiber concentrations in soils. Furthermore, EPA agrees that Thompson et al. 2011. provides concentrations of asbestiform amphiboles across the U.S. However, the study recognizes the potential sources of uncertainty from inclusion of fiber sizes and shapes that are outside the definition under this assessment. EPA opted for not including Thompson et al. 2011because the discussion about asbestos fiber distribution and uncertainty is better characterized by Gunter 2018 and EPA already recognizes the uncertainties in using data that considers fibers outside the ratio defined by this assessment. Smith et al. 2013 did not provide asbestos specific information so it was not included in the assessment.

Section 4 Environmental Risk Assessment

Summary: A commenter (0051) commented that EPA should provide a more robust assessment of environmental risk to terrestrial organisms and a larger focus on ecological risk throughout the assessment. The commenter noted that asbestos has been linked to mortality and adverse developmental

and reproductive effects in amphibians and earthworms without accompanying citations. Respiratory effects and cancers were also noted without additional details or citations.

Another commenter (0068) supported EPA's preliminary determination that asbestos does not present unreasonable risk to the environment.

> **EPA Response:** EPA considered ecologically relevant hazards and exposures to characterize environmental risk, which ultimately led to the determination that legacy uses of asbestos do not present an unreasonable risk to the environment. Through systematic review, EPA captured reasonably available data pertaining to the hazards of asbestos in ecological organisms and their exposure to asbestos. Ecological risk assessment focuses on mortality, reproduction, and growth; the available asbestos studies reporting respiratory outcomes and cancer were not considered to be relevant for environmental risk assessment and were not included in the environmental hazard risk consideration.

Section 5 Human Exposure

5.1 Occupational Exposure

5.1.1 General Comments on Occupational Exposure

Summary: A commenter (0078) stated that the EPA could overestimate exposure by using a value of half the limit of detection for non-detects in the 8-hr time weight average (TWA). The commenter expressed concern that EPA used monitoring data from studies with medium to low confidence. Toxics Release Inventory (TRI) data from 2016-2020 is stated to potentially overestimate disposal of asbestos containing materials. The commenter suggested that 5 years is a more appropriate lifetime exposure than 40 years.

> **EPA Response:** EPA considered exposure data for occupational exposure assessments in accordance with well established guidelines and as part of the weight of scientific evidence. For data sets including exposure data that were reported as below the limit of detection (LOD), EPA estimated the exposure concentrations for these data following guidance in EPA's *Guidelines for Statistical Analysis of Occupational Exposure Data* (US EPA 1994). The quality of the monitoring data was evaluated using the data quality review evaluation metrics and the rating criteria described in the *Draft Systematic Review Protocol Supporting TSCA Risk Evaluations for Chemical Substances* (US EPA 2021). In addition to the data quality determination from systematic review, EPA established an overall confidence for the data when integrated into the occupational exposure assessment based on the assessment approach, the quality of the data and models, and uncertainties in assessment results to assign an overall confidence level of robust, moderate, slight, or indeterminant. Studies with a medium and low quality determination were considered in the risk evaluation as part of the weight of scientific evidence to fill data gaps. For estimating environmental releases of legacy asbestos, EPA used TRI data and noted uncertainties associated with programmatic data in the *Asbestos Part 2 Risk Evaluation*. Lastly, the provided citation for 5 years of lifetime exposure reflects tenure with a current employer, not total time in a given field; EPA maintains that a 40-year lifetime exposure is appropriate for the occupational exposure scenario.

Summary: A commenter (0058) provided a comment including personal experiences and providing supplemental exposure data. The commenter stated that previous and present asbestos exposures continue to cause death and injury to insulator members and their families, citing in particular deteriorated and damaged asbestos in place at industrial and commercial facilities.

The commenter attached a white paper that outlines asbestos exposure at large industrial job sites and details an early detection lung cancer screening program with low dose chest CT scans. The commenter states that 47% of Chicago insulators screened who started work in the 1980s have developed asbestos pleural disease. The white paper states that many Chicago Insulators estimate that over 50% of the original asbestos remains at certain industrial facilities. The white paper also states that applying asbestos-free insulation in close proximity to damaged asbestos thermal insulation on a valve, pipe, product line or steam line is a source of asbestos exposure for those who regularly work in these heavy industrial settings. Personal stories of members diagnosed with mesothelioma were shared.

The commenter points towards internal corporate documents noting the presence of amosite, crocidolite, and chrysotile asbestos in "floor sweeping" samples from a boiler room floor in 1992. The commenter argues that deteriorated asbestos remaining in place is a significant source of occupational exposure to asbestos. On a personal note, the commenter describes encountering damaged and deteriorated asbestos insulation at Chicago-area refineries, powerhouses, and steel facilities in the 1990 and 2000s. The commenter concludes that asbestos exposure is not a problem of the past and should be addressed by industry to protect workers.

Another commenter (0082) stated that the presence of damaged asbestos insulation in older industrial facilities is a serious health threat to insulators who entered the workforce after the insulation was no longer installed. The commenter cited the above white paper submitted to EPA by the International Association of Heat and Frost Insulators and Allied Workers that demonstrates that damaged and deteriorated asbestos continues to be a systemic worker protection concern. The commenter highlighted that a medical screening that demonstrated that 47% of insulators who joined the workforce after asbestos thermal insulation was installed were diagnosed with asbestos pleural disease and that normal wear-and-tear and poor maintenance practices are responsible for significant legacy asbestos exposure and increases in asbestos disease.

> **EPA Response:** In response to these comments, EPA has expanded its discussion of deteriorated or damaged asbestos in relation to indoor air assessments.
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> All occupational exposure estimates were determined using inhalation monitoring data, and these data include exposures from the activity as well as any background exposure that may exist, such as exposure from floor sweepings of debris containing asbestos or damaged insulation. The white paper submitted by the commenter offers an overview of a health screening program and self-reported exposure to asbestos but does not provide occupational monitoring data relevant to the occupational assessment.
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> EPA agrees that legacy asbestos containing products may become deteriorated or damaged over the years. Data that were gathered during systematic review shows that in the absence of asbestos modifying activities, indoor asbestos concentrations were non-detects or below detection limits. While asbestos containing materials may deteriorate over time, the indoor data used by EPA do not identify measurable fibers. Moreover, these data do not result in detectable fiber concentrations from the processes of cleaning and ventilation in these indoor environments.

Summary: A commenter (0072) recommended that the Agency refine the exposure groups due to overly broad parameters based on those users using similar products and activities to better characterize potential exposures to workers, occupational non-users (ONUs), and consumers. The commenter notes that exposure assessment should be refined to the level of the 'exposure groups" as they were proposed by EPA, or a similar group, when unreasonable risks are identified at conditions of use or occupational exposure scenarios that encompass multiple/similar exposure groups.

> **EPA Response:** Where sufficient data were available to make the distinction, EPA refined the occupational exposure assessment to distinguish between high exposure potential workers, low exposure potential workers, and ONUs "exposure groups." In order to account for the variety of legacy asbestos products, EPA developed Occupational Exposure Scenarios (OESs) to group Conditions of Use (COUs) by similar use and release patterns in the workplace. Table 3-1 of the risk evaluation provides a crosswalk between OESs and COUs, and EPA explains each OES within Appendix G of the risk evaluation.

Summary: A commenter (0062) with expertise in microscopy and industrial hygiene submitted a list of publications on asbestos, as well as a discussion on asbestos exposure through indoor dust. A summary of a publication summarizing multiple asbestos fiber release studies in a constructed simulation chamber, personal and area air sampling, and fiber release from clothing was provided with a description of how to incorporate into the risk evaluation. The commenter encouraged EPA to consider these data in the final risk assessment.

> **EPA Response:** Upon review, EPA determined that these studies did not provide any additional quantitative monitoring data outside the range of what was previously identified in the initial systematic review process. Thus, the provided citations were not considered further in the risk evaluation. The occupational exposure assessment used monitoring data for all occupational COUs. Any settled dust that becomes airborne during work is captured by the monitoring data used for occupational exposure assessment.

Summary: A commenter (0073) expressed concern that EPA failed to account for certain categories of workers exposed to asbestos. First, the comment points towards workplaces contaminated with friable asbestos that degrades in place as overlooked exposures. The commenter disagrees with the Agency's conclusion that asbestos only becomes friable as a result of "asbestos-emitting activities" and asserts that all in-place asbestos will become friable, even when there is no activity disturbing the asbestos containing material (ACM). An overview of aging public and industrial buildings is provided, while noting that an EPA study from 1984 cited in the draft risk evaluation found that 20 percent of U.S. commercial and public buildings (more than 700,000) contain asbestos material in friable form. The commenter notes that while EPA questioned how many of those buildings were still standing, EPA should consider how many additional buildings' ACM has become friable over time. The commenter states that workers in these facilities face the same risks to health as those workers in proximity to active asbestos-emitting activities. Workers are noted to either not be aware of asbestos exposure or have insufficient controls in place to prevent exposure; specific examples are provided. Specifically, the commenter discussed exposures to public sector workers (citing a GSA IG report), workers in education settings (citing AHERA inspection information and including photo documentation of deteriorating asbestos), and utility workers at power plants and water treatment facilities (noting the age of the country's electrical generating facilities).

Second, the commenter noted that workers in facilities with in-place asbestos are not covered by the risk evaluation, including utility workers and office workers. Lists of relevant standard occupational codes (SOCs) the commenters would like included are provided. Finally, the commenter expressed support of EPA's decision to not include PPE in risk characterization.

> **EPA Response:** To address this comment, an acknowledgement of the relevance of the indoor air assessment to schools and similar scenarios has been added to the risk evaluation.
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> With regard to the inclusion of workplaces with in-place asbestos, such as schools, the indoor air assessment is most reflective of these exposures. In that assessment, EPA considered monitoring data of suspended fibers in residential and public buildings, which supported the finding that asbestos exposure is associated with directly modifying the asbestos containing materials. Data gathered during systematic review shows that in the absence of asbestos modifying activities, indoor asbestos concentrations were non-detects or below detection limits. While asbestos containing materials may deteriorate over time, the indoor data used by EPA do not identify measurable fibers. Moreover, these data do not result in detectable fiber concentrations from the processes of cleaning and ventilation in these indoor environments. As noted by the commenter, EPA used a 1984 building survey to inform the estimate of asbestos in U.S. commercial and public buildings. Although the building survey was conducted decades ago, it provides a reasonable upper bound, given that use of asbestos in construction materials has been drastically reduced since that time.
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> With regard to the expansion of occupations with potential exposure to asbestos, EPA only utilizes codes in the risk evaluation to estimate the number of workers and establishments. Even though the codes identified in the comment may not be specifically referenced in the risk evaluation, the OESs used in the risk evaluation remain protective of those additional occupations. The work codes may be revisited during rule making.

Summary: A commenter (0069) proposed an expansion of occupations that are exposed to legacy asbestos uses. Specifically, the commenter asserts that, due to the age of facilities, EPA should consider exposures to cultural workers (e.g. museum and library workers), educational services, and correctional officers. Additionally, the commenter recommended updating ONU designations to encompass additional types of individuals with asbestos exposures and included a list of additional Standard Occupational Classification (SOC) codes that were not included in the draft risk evaluation. Additionally, the commenter suggested reclassifying some ONUs as workers due to exposure potential: Industrial Engineers, Including Health and Safety; First-Line Supervisors of Fire Fighting and Prevention Workers; First-Line Supervisors of Building and Grounds Cleaning and Maintenance Workers; First-Line Supervisors of Housekeeping and Janitorial Workers; Construction and Building Inspectors; and Supervisors of Installation, Maintenance and Repair Workers

> **EPA Response:** With regard to the expansion of occupations with potential exposure to asbestos, EPA only utilizes codes in the risk evaluation to estimate the number of workers and establishments. Even though the codes identified in the comment may not be specifically referenced in the risk evaluation, that does not mean the OESs do not cover those occupations. The work codes will be revisited during rule making. Since the occupational exposure assessment focuses on COUs rather than worker categories, and risk was identified for both worker and OUNs for each occupational COU, modification of work codes would not change the risk

designations. Therefore, the OESs used in the risk evaluation remain protective of those additional occupations.

Summary: A commenter (0072) stated that the Agency should appropriately characterize the duration and frequency of exposure for conditions of use that occur on an intermittent basis. The commenter states that the EPA overestimated the duration of exposure (8 hours per day, 250 days per year) for several conditions of use that are typically managed in intermittent intervals. The commenter also states that this frequency estimate will substantially overestimate exposure since the prevalence of asbestos in buildings today is much lower than in 1984 and it is unlikely that any workers, outside of those in the asbestos abatement industry, would encounter asbestos more than 50 days per year.

EPA Response: EPA agrees that some workers may be exposed to asbestos on an intermittent basis, and this is captured in the Maintenance, Renovation, and Demolition OES and the Firefighting and Disaster Response OES. For these two OESs, there were data available to estimate the proportion of the workdays that asbestos exposure may occur. However, for other OESs, EPA did not have data to make this distinction. In absence of data specific to an OES, it was assumed that workers may be exposed daily.

Summary: A commenter (0077) stated that Maintenance, Renovation, and Demolition is the OES likely to represent the greatest number of workers, the largest volume of asbestos, and some of the most challenging conditions of control. The commenter stated that it is hard to believe that the central tendency estimate for "higher-potential workers" for an 8-hour-TWA in the OES is 0.0011 f/cc and the 30-minute exposure concentration for the same worker is 0.025 f/cc and stated that the high end estimates are also quite low, especially since protective measures are likely not taken.

The commenter expressed concern over EPA's reliance on OSHA-CEHD data due to intervention of OSHA into the workplace (i.e., the Hawthorne effect). Specifically, the commenter notes that the employer and workforce are under best behavior and that work practices (e.g., wetting the material) are likely altered for the monitoring session, undermining the value of the monitoring results as a basis to characterize "central tendency" or "high-end" exposures.

EPA Response: The high-end estimate for "higher-potential workers" for an 8-hour-TWA in the Maintenance, Renovation, and Demolition OES and the 30-minute exposure concentration for the same worker is supported by reasonably available information identified during systematic review. As noted in the risk evaluation, EPA acknowledges that there were a large number of non-detect data identified for the demolition, maintenance, and renovation scenario. Therefore, EPA assumes that risk to workers involved with demolition, maintenance, and renovation of structures containing asbestos is most reflected by the high-end of the higher exposure potential worker group, which should result in risk estimates that are reflective of asbestos exposure across a wide range of maintenance, renovation, and demolition activities. A summary of the variation observed across the occupational exposure data sets is provided in Section 5.3.2 of the risk evaluation.

EPA is required under TSCA to consider all reasonably available information, so it is reasonable for EPA to rely on OSHA-CEHD data in the risk evaluation.

Summary: The commenter (0077) stated that only three North American Industry Classification System (NAICS) codes were included under the exposure scenario "use, repair, or removal of appliances and machinery that contain asbestos" and therefore the number of workers in the OES may be under-estimated. The commenter stated that the logic of the NAICS composition is unclear and should be revisited as there are other manufacturing industries where workers handle gaskets and packing (paper, petrochemical, other inorganic chemical, pharmaceuticals, and plastics).

> **EPA Response:** In response to the comment, EPA has reviewed the NAICS codes used for estimating the number of workers involved in use, repair, or removal of appliances and machinery that contain asbestos. Uncertainties in worker estimates are described in the Section 5.1.1.4.1 of the *Asbestos Part 2 Risk Evaluation*. Specifically, it is stated that "EPA's judgments about which industries (represented by NAICS codes) and occupations (represented by SOC codes) are associated with the uses assessed in this report are based on EPA's understanding of how asbestos is used in each industry. Designations of which industries and occupations have potential exposures is nevertheless subjective, and some industries/occupations with few exposures might erroneously be included, or some industries/occupations with exposures might erroneously be excluded." This uncertainty is unlikely to systematically either overestimate or underestimate the number of exposed workers. Regardless, the number of exposed workers would not alter the risk determination.

Summary: A commenter (0069) provided information on chronic, routine, and episodic occupational exposure to asbestos. The commenter states that presumed asbestos-containing materials (PACM) may not be identified as containing asbestos. The commenter notes that maintenance workers, laborers, and trades workers clean and repair damage to PACM after leaks, storms, or fires. Specific examples of disturbance of asbestos during maintenance or repair of areas not identified as containing asbestos were provided with description of associated bystander and take-home exposures.

> **EPA Response:** Since the EPA does not consider the use of PPE or engineering controls in its risk evaluations (but does consider these practices during risk management), the OES in the risk evaluation are representative of unknown exposure to ACM. Conditions of use associated with bystander and take-home exposure to asbestos are included in the risk evaluation.

5.1.2 Personal Protective Equipment and Engineering Controls

Summary: Several comments related to the consideration of personal protective equipment, engineering controls, and assumptions regarding compliance with existing regulations are summarized below.

A commenter (0060) agreed with EPA's decision to not include consideration of PPE in the risk evaluation, but recommended research on current practices during risk management. Similarly, an organization representing formal EPA career staff and confirmation-level appointees (0068) expressed support for EPA's assumptions that workers do not utilize PPE.

Three commenters (0069, 0068, and 0081) expressed support for assuming non-compliance with existing federal laws and regulations, providing examples with OSHA and AHEA non-compliance.

A commenter (0072) commented that the Agency did not adequately consider the exposure controls in the assessment of occupational exposure scenarios where they are already common practice. The commenter states that many workplaces have administrative, engineering, and personal protective equipment controls in place either as a regulatory requirement or as a best management practice and the Agency failed to consider this in the development of its assessment.

A commenter (0078) strongly recommended that the conditions of use be updated to reflect existing worker protection requirements and practices, including the use of PPE, protocols for handling asbestos, training and other hazard communication programs. The commenter stated that the use of PPE is "supported by the reasonably available information" and that EPA's failure to consider PPE asserts that there is widespread noncompliance with Occupational Safety and Health Administration (OSHA) regulations. Training, certification, and work practices at in the oil and gas natural gas industry, including petroleum refinery buildings, were outlined.

> **EPA Response:** In accordance with the TSCA Risk Evaluation Rule, EPA does not assume compliance with existing regulations, including the use of PPE, in the risk determination. As one commenter (0078) noted, the TSCA Risk Evaluation Framework Rule states that "in determining whether unreasonable risk is presented, EPA's consideration of occupational exposure scenarios will take into account reasonably available information, including known and reasonably foreseen circumstances where subpopulations of workers are exposed due to the absence or ineffective use of personal protective equipment. As stated in Section 6.1 of the risk evaluation, "Not assuming use of PPE reflects the Agency's recognition that unreasonable risk may exist for subpopulations of workers that may be highly exposed because they are (1) not covered by OSHA standards; (2) their employers are out of compliance with OSHA standards; (3) many of OSHA's chemical-specific permissible exposure limits largely adopted in the 1970s are described by OSHA as being "outdated and inadequate for ensuring protection of worker health" ; or (4) EPA finds unreasonable risk for purposes of TSCA notwithstanding OSHA requirements." Though there are existing regulations regarding asbestos, EPA does not assume compliance with these regulations for making unreasonable risk determinations. EPA will not consider exposure reduction based on assumed use of personal protective equipment as part of the risk determination." 40 CFR 702.39(f)(2). However, it should be noted, that able 5-21 of the *Asbestos Part 2 Risk Evaluation*, EPA does provide risk reduction estimates for the use of respirators with APF 10 and 50, which can be considered in the risk management phase.

5.1.3 Disaster Response

Summary: A commenter (0082) stated that cleanup and remedial work following emergencies and disasters typically involve untrained, short-term workers, usually immigrant day laborers, that rarely have personal protection or are uninformed about the hazards. The commenter recommended that this population be described and presumed to have high-end exposures for the tasks they perform in the Part 2 evaluation.

One commenter (0077) cited a report (Malievskaya, 2002) to support the above comment, showing that after the World Trade Center collapse in NYC, and after Hurricane Sandy, the clean-up workers were engaged in short-term jobs, and were usually immigrant day laborers. The commenter also stated that EPA should consider this population as a potentially exposed or susceptible subpopulation (PESS).

EPA Response: EPA agrees that the worker population dealing with disasters and firefighting events face potential asbestos exposures and has identified workers handling asbestos-containing building materials (including during firefighting or other disaster response activities) as PESS (Table 5-26). EPA has included monitoring data from post-disaster cleanup and related disaster response activities in its analysis of the OES "Handling of asbestos-containing building materials during firefighting or other disaster response activities." The assessment in this OES of disaster and firefighting workers assumes that all such workers may be exposed at the high-end level estimates of exposure due to the extreme nature of the work.

Summary: A commenter (0060) advocated for addressing general public's potential exposure to asbestos resulting from weather events and other disasters such as fires and hurricane damage. The commenter notes that climate change could increase the frequency of these natural disasters.

A commenter (0073) stated that EPA should account for exposure to disaster response activities beyond firefighters. Details of work activities associated with the demolition, debris removal, site clean-up, emergency repairs, natural disaster response, and transportation for disposal were provided.

Another commenter (0082) stated that EPA provided limited information on disasters (explosions, floods, rail derailments, collapsed buildings, and other emergency events) except for fires and emphasized that this was a troubling omission given their frequency and likelihood to increase in the future due to climate change and extreme weather events. The commenter provided well-documented examples of disasters resulting in asbestos exposures and stated that it was indefensible to disregard disasters and emergencies as "unique" events outside of the scope of TSCA risk evaluations when they are both foreseeable and expected and result in widespread and harmful exposure to asbestos.

EPA Response: EPA considered disaster response for a range of activities, including firefighting, debris removal, and site clean-up, under the OES titled "Handling Asbestos-Containing Building Materials During Firefighting and Disaster Response Activities." EPA relied on a variety of inhalation monitoring data from workers involved in disaster response, debris removal, and site clean-up to characterize occupational exposures for that OES. These exposure estimates are not only valid for firefighting workers, but also for any worker involved in disaster response, debris removal, and site clean-up. For characterizing the number of workers and exposure frequency, EPA had the most reliable data on career and volunteer firefighters from the NFPA. However, the exposure estimates are relevant for all disaster response workers involved in the handling of building materials during disaster response. Regarding demolition and disposal activities, occupational exposures are characterized under the OESs titled "Handling Asbestos-Containing Building Materials During Maintenance, Renovation, and Demolition Activities" and "Waste Handling, Disposal, and Treatment", respectively. Further consideration of disasters is not reasonably known or foreseen and is therefore outside of the scope of this risk evaluation.

EPA assumed that 20% of existing buildings contain asbestos (U.S. EPA 1998), which is expected to be a conservative estimate for release assessment for this OES due to the reduction in asbestos containing building materials used in new construction over recent decades. Though there is uncertainty regarding the quantity of asbestos released from all disaster events in the U.S., EPA uses firefighting response statistics to provide a baseline estimate for annual releases from unexpected disasters.

5.2 Indoor Dust in Schools and Other Public Buildings

Summary: A commenter (0067) expressed concern about the EPA consideration of settled dust in schools and other public buildings. Specifically, the commenter stated that "deteriorating asbestos in older schools and other public buildings poses a significant health risk to teachers, staff, and children." The commenter also suggested that EPA evaluate occupational exposures to asbestos in dust in occupational settings, such as during the manufacture of cosmetics containing talc and other talc products.

> **EPA Response:** To address this comment, EPA recognizes of the importance of considering indoor air exposure to schools and similar scenarios. As such, in response to public comments, EPA has added a description of how the indoor air assessment outlined in Section 3.1.4 of the risk evaluation applies to schools where undisturbed legacy asbestos may be present in a school building.
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> The release of asbestos fibers from materials can be due to intentional (*e.g.*, cutting, sanding, removing, moving the material) and unintentional (*e.g.*, material deterioration, fires, water damage) activities. However, the released fibers need to be suspended in air to be inhaled, while settled fibers need to be resuspended. The EPA's indoor air assessment considered suspended dust and particulate as potential sources of inhalation exposures. The studies used to inform the indoor air assessment presented in Section 3.1.4 provide air samples that contain suspended asbestos fibers containing dust and particulate. Settled dust data identified were not used in the exposure estimates because of a lack of data available to calculate resuspension in the air needed for inhalation. While asbestos containing materials may deteriorate over time, the indoor data used by EPA do not identify measurable fibers. Moreover, these data do not result in detectable fiber concentrations from the processes of cleaning and ventilation in these indoor environments. EPA used the breathable air (suspended dust and fibers) asbestos concentrations for inhalation exposure estimates during normal occupancy of the indoor environment.
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> Within occupational settings, EPA characterized exposures to asbestos using inhalation monitoring data for all scenarios. The occupational inhalation monitoring data include background exposures, which account for exposure to dust, as well as exposures from the worker activities.

Summary: A commenter (0062) with expertise in microscopy and industrial hygiene submitted a list of publications on asbestos, as well as a discussion on asbestos exposure through indoor dust. The commenter noted that take-home exposure can result from asbestos settling on portable surfaces (e.g. hair, clothing) and then be resuspended during handling/cleaning to resettle on non-portable surfaces (e.g. bathroom countertops). Levels of asbestos from clothing shakeouts were noted to be up to 100 f/cc in studies published from 1970-1999 and disturbed with vacuuming contaminated surfaces. A summary of a publication summarizing multiple asbestos fiber release studies in a constructed simulation chamber, personal and area air sampling, and fiber release from clothing was provided with a description of how to incorporate into the risk evaluation. The commenter encouraged EPA to consider these data in the final risk assessment.

> **EPA Response:** Take-home exposures, such as from garments contaminated with asbestos, were considered as part of the risk evaluation. The take home assessment estimates inhalation exposures to asbestos fibers that were deposited on the worker's clothing and subsequently

transported home where the worker or garment handler would shake the fibers and inhale the suspended/breathable fibers. The take-home exposure is the inhalation of suspended asbestos fibers from cleaning or shaking of the contaminated clothes/garment. These suspended concentrations are expected to be greater than concentrations that sit on surfaces and potentially resuspend. Therefore, EPA's take-home assessment is inclusive and protective of dust resuspension.

EPA reviewed the citations provided and determined that these studies do not provide any additional quantitative monitoring data outside the range of what was previously identified in the initial systematic review process. Thus, the studies were not considered further in the risk evaluation.

Summary: Two commenters (0071, 0082) said that there is a faulty assumption that asbestos in building materials does not pose a risk unless there is construction, modification or demolition of ACM, which fails to recognize the risk from ACM damaged by age, water, or trauma. These commenters suggested that EPA conducted a limited systematic review of exposure data for several reasons. The comments also note that EPA excluded sampling data obtained in schools under AHERA on the rationale that they were "non-occupational exposures" as the data were collected during abatement activities. The commenter provided the findings of a report conducted in a Yale building, noting that air sampling found an average concentration of asbestos from eight samples of 0.3 f/cm3, with a range of 0.1-0.5 f/cm3 8 years after construction, in a room with a deteriorating ceiling.

A commenter (0060) commenter noted AHERA and NECS are potential sources of data for determining exposure in schools and recommended implementing a compliance monitoring program. The commenter suggested adding NAICS 61 code for school staff and splitting exposure estimates and protection by school population (e.g. students vs staff).

A commenter (0081) suggested EPA access and analyze records from school districts that successfully implemented AHERA to better understand legacy exposure.

A commenter (0081) listed potential legacy asbestos-containing materials in schools and stated that while friable asbestos has largely been eliminated from schools, non-friable materials remain in place. The commenter expressed concern that increased frequency of natural disasters poses an increased risk of release of asbestos fibers in schools.

EPA Response: EPA considered emissions of asbestos fibers when asbestos materials were modified in some form (*e.g.*, renovation or damage of asbestos containing materials). The fibers released during those activities were used to estimate exposure concentrations and risk. Data gathered during systematic review show that in the absence of asbestos modifying activities, indoor asbestos concentrations were non-detects or below detection limits. While asbestos containing materials may deteriorate over time, the indoor data used by EPA do not identify measurable fibers. Moreover, these data do not result in detectable fiber concentrations from the processes of cleaning and ventilation in these indoor environments. Regarding the Yale study, Sawyer, 1977, the systematic review process rated the overall study quality determination as low, because its description of sampling and analytical methods and approaches lacked sufficient details. While the measurements provided by the commenter could be used for indoor

assessments, EPA related other studies with higher ratings and fewer uncertainties to utilize the best available science for the indoor assessment.

Data collected during abatement activities under AHERA are relevant to occupational exposures, not reflective of the day-to-day exposure within schools captured by the indoor air assessment relevant to schools. While inspection data collected under AHERA may by relevant to the indoor air assessment, since it would identify asbestos-containing materials in each of the public and private elementary and secondary schools under its authority, it does not provide monitoring data that can be used in an indoor air assessment with preferable source apportioned respirable (suspended air) emissions data for asbestos fibers within the size and shape ratio targeted in this assessment. Renovations or repair of public buildings, such as schools, with asbestos containing materials are characterized under the associated COUs for occupational, bystander, and general population exposures.

5.3 Take Home Exposure

Summary: A commenter (0068) expressed support for EPA's consideration of take-home exposures, noting that OSHA regulations for contaminated clothing may not always be followed.

EPA Response: EPA appreciates the support of EPA's analysis of take-home exposures. The exposure scenarios do not assume compliance with existing federal regulations.

Summary: A commenter (0069) provided specific examples of take-home exposure to asbestos.

EPA Response: EPA agrees that household members who may handle garments or come into contact with garments of workers and occupational non-users are at risk of exposure to asbestos fibers from the occupational users and has accounted for this in the RE under the take home handler and bystander risk estimation.

Summary: A commenter (0073) expressed concern that EPA undercounts vulnerable household members with take-home asbestos exposures by limiting analysis to handling contaminated clothing during laundering. The commenter points towards a case where blood lead levels were used a as a surrogate for take-home exposure as an example of how surrogate data could inform take home exposure to asbestos in children, a susceptible population. The commenter suggests that take-home exposure stems from failure of employers to provide sufficient training and decontamination protocols.

EPA Response: The take-home exposure scenarios represent a variety of lifestages, including children. The take-home asbestos analysis estimated exposures and risk for various populations for the bystander scenario, including lifetime and less-than lifetime. The lifetime exposures were assessed from birth to 78 which is discussed and summarized in Appendix L.3, represent exposures from birth and throughout their entire life, whether in the same household or other with similar take-home exposure possibilities. A less-than-lifetime scenario was also assessed, with exposure starting at 16 years of age and lasting for 40 years or the duration of the work (i.e., source of the asbestos fibers), and represents workers, spouses, and others that are in proximity to the contaminated clothing handling. This less-than-lifetime scenario is described in Appendix

L.3. And lastly, the risk evaluation includes a less-than-lifetime scenario starting at birth for 20 years, which represents children living at home while contaminated clothing is handled. This last scenario is discussed in the body of the main Risk Evaluation document and Appendix L.3. These three populations are representative of various lifestages and consider take-home exposures to children.

While using a surrogate data can be an appropriate approach, there is no need for such approaches when there are available studies monitoring asbestos fiber releases during an activity, see Appendix L.1 for list of studies.

Summary: A commenter (0072) commented that the EPA needs to revise its approach to evaluating take-homes exposures to equally weigh the available data and better address the uncertainties with the data. The commenter notes that the regression analysis across the nine data sets caused two high exposure studies to overly influence the results of the regression. The commenter stated EPA should instead derive a slope factor for each data set and determine the mean and 95th percentile of the nine ratios to estimate a central-tendency and a high-end slope factor, respectively. The commenter also noted there were a number of uncertainties associated with the studies of take-home exposure, including frequency of garment use, daily garment use pattern, and estimated clothing handler and bystander exposure concentrations compared to ambient concentrations of asbestos.

EPA Response: EPA maintains that the best available science was used to evaluate take-home exposures (and associated bystander exposures) for the specific asbestos COUs in this risk evaluation. While there are multiple approaches to treating skewed data, EPA determined that splitting the nine datasets into high and low intensity use and applying regressions to each use pattern allowed for the development of a distribution that captures a wide number of use possibilities, rather than a single slope. The uncertainties from the approach, studies, assumptions, and parameters used in the take-home assessment are described in Section 3.1.2.3 of the risk evaluation. e

5.4 General Population Exposures

Summary: Two commenters (0078 and 0082) state that EPA's failure to consider regulations association with disposal overestimates general population exposure. The commenters state that the approach EPA used for general population exposures includes unsupported assumptions that do not consider proper controls and safeguards already in place under existing laws including transportation rules, Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) programs, and state pollution control districts in managing the materials from asbestos abatement activities. The commenter states that if OSHA regulations are being followed, and asbestos-containing material is properly containerized, the risks should not be unreasonable.

Additionally, the commenters state that it is unrealistic to assume that uncontrolled ACM is being spread throughout the general population up to 1,000 m from a source and all along a disposal route because that is at odds with current practices for ACM. One commenter recommends consulting with the Agency's CERCLA and RCRA programs to discuss the implications of this assumption and that EPA could include

better-optimized modeling and sensitivity analyses in refining the draft risk evaluation to better understand appropriate measures that effectively mitigate asbestos transport risk.

> **EPA Response**: The TSCA Risk Evaluation Framework Rule states that "EPA will assess all exposure routes and pathways relevant to the chemical substance under the conditions of use, including those that are regulated under other federal statutes." 40 CFR 702.39(d)(9). Thus, EPA has appropriately considered general population exposures, even where there are existing regulations. This assessment appropriately considers disposal of asbestos materials without consideration of existing regulations, including where such materials may reach general landfills or other locations that are not prepared or authorized to receive asbestos. EPA considered information that shows these scenarios are likely to occur.
>
> The consideration of exposures to the general population at 1,000 m and further distances from the asbestos emitting source is standard in the type of modeling performed in this assessment. EPA can limit or change the distances modeled. The practice of obtaining modeling results that both explore and confirm expected decreases of concentrations away from the source provide a higher level of confidence in the modeling results, while simultaneously exploring the levels that can be expected at larger distances. Additionally, EPA consulted with other programs offices within EPA regarding this analysis, which were generally supported.

Summary: A commenter (0082) stated that EPA's assessment of legacy asbestos waste is incomplete for various reasons. The commenter stated that the TRI database only accounts for a small percentage of all asbestos containing waste because the data are self-reported, exclude certain facilities, only cover friable asbestos, and require reporting only after a certain volume threshold is exceeded. Additionally, the commenter stated that the Part 2 draft Risk Evaluation lacks a breakdown on the types of disposal sites receiving asbestos waste and the location of these waste sites, and therefore is unable to address the proximity of these sites to environmental justice communities. The commenter also cited the lack of discussion on conditions and management practices at these facilities and the potential for offsite releases of asbestos-containing dust that result in exposure by nearby residents or bystanders.

> **EPA Response:** The exposures of the general population to asbestos disposal facilities or landfills were assessed to address all disposal locations. The use of TRI data for this screening assessment is consistent with using the best available science. If a population is present at the exposure distance assessed, then the findings of this assessment would apply. The assessment evaluated the disposal of asbestos materials following specific mitigation guidelines (see guidelines on asbestos disposal, https://www.epa.gov/asbestos/asbestos-laws-and-regulations) in authorized landfills. In addition, the assessment considered disposal exposures across locations that may dispose of asbestos materials in a manner that does not mitigate exposures, such as disposal of numerous consumer products, see Table 3-1 and do-it-yourself (DIY) disposal materials.

Summary: A commenter (0082) noted that the asbestos Part 2 draft Risk Evaluation did not address asbestos found at Superfund cleanup sites under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) despite reports of 16 Superfund Sites that contained asbestos hazards. The commenter also reported that ASTDR identified asbestos in at least 83 additional

waste sites screened for inclusion in the NPL and that asbestos releases were ongoing and therefore were creating a potential exposure pathway for nearby communities.

> **EPA Response:** EPA did not include legacy disposals, (*i.e.,* disposals that have already occurred), because they do not fall under the definition of conditions of use under TSCA section 3(4). *See Safer Chemicals, Healthy Families v. EPA*, 943 F.3d 397 (9th Cir. 2019). However, the assessment considered disposal exposures across locations that may dispose of asbestos materials in a manner that did not follow existing guidelines, such as disposal of numerous consumer products without mitigations, see Table 3-5 and DIY disposal materials.

5.6 Bystander Exposure

Summary: A commenter (0074) expressed concern that bystanders are not sufficiently considered in scenarios where asbestos work is improperly performed. Exposure of occupants adjacent to improperly conducted demolition of asbestos containing materials to lingering asbestos was provided as an example.

> **EPA Response:** EPA considers exposure to bystanders (non-occupational) and occupational non-users (ONUs) for each occupational and non-occupational exposure scenario, as described in Section 5.1. Generally, bystanders and ONUs are people in the vicinity of an activity that modifies an asbestos containing material but are not themselves performing the activity. The EPA would like to clarify that, accordance with the TSCA Risk Evaluation Rule, the risk evaluation does not assume compliance with existing regulations in either the occupational (e.g. construction) or consumer (e.g. DIY remodeling) scenarios As stated in Section 6.1 of the risk evaluation, "Not assuming use of PPE reflects the Agency's recognition that unreasonable risk may exist for subpopulations of workers that may be highly exposed because they are (1) not covered by OSHA standards; (2) their employers are out of compliance with OSHA standards; (3) many of OSHA's chemical-specific permissible exposure limits largely adopted in the 1970s are described by OSHA as being "outdated and inadequate for ensuring protection of worker health" ; or (4) EPA finds unreasonable risk for purposes of TSCA notwithstanding OSHA requirements." Therefore, the associated bystander analysis is representative of improperly conducted demolition activities. However, mitigation strategies and best practices may be considered as part of risk management.

5.7 Aggregate Exposure to Asbestos

Summary: A commenter (0068) expressed confusion around the aggregate risk approach, specifically stating that aggregate assessment should include all COUs expected to co-occur regardless of individual risk status. Two recommended approaches to aggregate risk are outlined and details are requested on the co-occurrence. First, they recommended one mode of analysis that would be to identify and aggregate only "on-their-own, no-risk" scenarios. If, in combination, the group is determined to be an unreasonable risk, it should prompt the re-labelling of each "no-risk" scenario as "unreasonable." If this combination did not reach the unreasonable risk threshold, they would likely remain "no-risk" based upon only that one combination. Alternatively, the commenter recommends a second mode of analysis that would identify and aggregate all scenarios with a reasonable probability of co-occurrence, which would increase the total level of risk.

Similarly, a commenter (0082) generally agreed with EPA's aggregate exposure analysis but stated that the constraints on the analysis were not explained and resulted in an incomplete and limited understanding of the combined impact of multiple exposure scenarios on overall risk. The commenter suggested EPA address aggregate exposures across COUs that exceed the risk benchmark to clearly identify higher risk populations and EPA provide a qualitative assessment of the potential aggregate risk for COUs lacking sufficient data to generate risk estimates.

> **EPA Response:** The aggregate analysis across COUs is available in Appendix M and provides an overview of how populations that perform multiple asbestos modifying activities could be exposed to asbestos fibers. However, there is very little reasonably available information on the probabilities of the aggregate scenarios to occur and which populations are performing various activities. Therefore, the aggregate analysis in this assessment has uncertainties that stem from the lack of a well-understood representative use pattern that prevent further risk characterization.
>
> TSCA Section 6(b)(4)(F)(ii) directs EPA to "describe whether aggregate or sentinel exposures to a chemical substance under the conditions of use were considered, and the basis for that consideration" in risk evaluations. Therefore, EPA may, but is not required to, consider aggregate exposure in this risk evaluation. *See* 89 Fed. Reg. 37028 (May 3, 2024)), which states "For risk evaluations in process as of the date of the final rule, EPA would expect to apply the proposed changes to those risk evaluations only to the extent practicable, taking into consideration the statutory requirements and deadlines."

Summary: A commenter (0071) stated that the risk evaluation obscures the reality that asbestos fibers from different sources and types of exposures accumulate in the lungs of a single individual exposed to asbestos. The commenter stated that this was obscured because the COUs are segregated by the type of exposure. Examples were provided to highlight how workers can be exposed to asbestos fibers at work and come home to do DIY activities where asbestos dust is generated.

> **EPA Response:** The aggregate analysis across COUs is available in Appendix M and provides an overview of how populations that perform multiple asbestos modifying activities could be exposed to asbestos fibers, using the data from individual COUs and specific activities. Hence, the aggregate analysis can provide the individual contributions to overall exposures to people exposed via various sources.

5.8 Other Comments on Exposure

Summary: A commenter (0060) suggested that EPA consider the localities/regions with asbestos cement pipes used for municipal water and sewer systems, by referencing several recommended sources (e.g., applications from municipalities (through state agencies) for funding from HUD's Community Development Block Grant program) and requesting NAICS codes be added associated with pipe replacement. The commenter also requested that EPA include the following statement in the risk evaluation made by EPA's Office of Air Quality Planning and Standards (OAQPS) in a 2019 alternative work practice standard for asbestos cement pipe replacement (84 *Federal Register* 26852): "There are over 630,000 miles of Asbestos Cement pipe buried across the United States that have reached or will reach the end of their estimated design and useful lives. Like most of our buried infrastructure, the time has come to renovate or replace these systems."

A non-profit (0066) stated that the description of analysis of asbestos cement pipes and occupational exposure to water supply and irrigation were not clear, then noted that construction and demolition activities are not reflective of typical use.

A commenter (0082) criticized EPA's determination of the low priority classification of asbestos cement pipes despite the existence of 630,000 miles of asbestos cement pipes in the country. The commenter cited the OAQPS finding that cement pipes in the U.S. have reached the end of their estimated design and useful lives. The replacement of these pipes will likely lead to hazardous exposures as documented in reports of bursting AC pipes in Houston, Texas, that documented substantial inhalation of asbestos fibers by poorly protected workers.

> **EPA Response:** EPA did not consider the ingestion of asbestos fibers as a relevant exposure pathway for establishing risks related to asbestos exposure. Studies aiming to assess the adverse health effects from asbestos ingestion have found low correlations or undecisive results (ATSDR 2012, Polissar et al. 1983). Additionally, asbestos fibers ingested will pass the digestive system and be excreted within a few days, while small fibers may migrate to blood or other tissues before urinary elimination. EPA agrees that there are many asbestos cement pipes in place and in use in the U.S., however, studies about asbestos fibers ingestion are inconclusive or show low correlation to adverse effects, in addition to the biological functions that are expected to remove ingested fibers.
>
> In addition, the 2016 Six-Year Review 3 (U.S. EPA, 2016) of drinking water database contains asbestos measurements from 2006 to 2011 from all U.S. states, territories, including tribal lands. Of the approximately 12,084 data points of asbestos concentrations measured in drinking water facilities, 330 measured asbestos above detection limit, and 15 samples were above EPA's Maximum Contaminant Level (MCL). The low number of detections of asbestos in drinking water supplied by asbestos-cement pipes in that data set, coupled with the lack of strong correlation between oral exposure to asbesto and adverse effects, supports EPA's decision to not further assess risk from drinking water.
>
> EPA-OPPT did not include the EPA-OAQPS statement in the risk evaluation; however, EPA-OPPT may consider the localities/regions with asbestos cement pipes used for municipal water and sewer systems during risk management and will work with EPA-OAQPS to consider any relevant information they have on the matter. Additionally, while EPA did not include the NAICS codes in the risk evaluation, EPA may consider whether they are appropriate during risk management. Lastly, EPA appreciates the recommendation to reach out to municipalities to gather information on the location of asbestos-containing pipes. However, in this case, consistent with EPA's approach of conducting fit-for-purpose risk evaluations, see 40 CFR 702.37(a)(4), EPA determined that a technically sound risk determination could be made, consistent with the best available science, without requesting or generating additional data (which, in any event, likely would not have been possible to produce and incorporate in the risk evaluation within the timeframe specified in TSCA section 6(b)(4)(G)).

Summary: A commenter (0074) outlined the limitations of using phase contract microscopy (PCM) to measure asbestos. The analytical method is stated to be limited by the amount of fibers necessary for detection as well as an inability to distinguish asbestos and non-asbestos fibers. The use of transition electron microscopy (TEM) was recommended.

EPA Response: EPA acknowledges the limitations of using PCM to measure asbestos, including that this analytical method only captures total fibers and is not specific to asbestos. EPA preferred the use of TEM studies. When only a small number of TEM studies were available, PCM analysis were considered with acknowledgement of the uncertainties associated with this method in the weight of scientific evidence and overall confidence. EPA recognizes that PCM will likely result in overestimation of exposures and risk, as discussed in Section 3.1.3.5 of the risk evaluation.

5.9 Susceptible Subpopulations

Summary: A commenter (0081) recommends EPA consider race in the asbestos risk evaluation to account for lower funding in districts serving students of color impacting building maintenance and renovations.

Another commenter (0082) criticized the lack of an environmental justice analysis in the draft risk evaluation to align with the Administration's emphasis on protecting vulnerable populations from disproportional risk to chemical exposures. The commenter emphasized that disadvantaged communities have disproportionate exposures to legacy asbestos. The commenter stated that the exposure is due to close proximity to landfills and disposal sites, to old industrial facilities that contain ACM and to poorly maintained housing, schools, and structures that contain legacy asbestos. The commenter also emphasized that residents often have high levels of asthma and other health conditions that can be aggravated by asbestos exposure and predispose them to asbestos disease.

EPA Response: TSCA risk evaluations are intended to be national assessments and the general population exposure assessment is generic rather than a location specific evaluation. As a generic assessment, it can be a useful resource to identify the exposures and risks should communities be found at certain distances from the sources and under potential risks. The assessment does not have the granularity, due to lack of location and demographic specific data, to assess exposures to specific demographics in the manner suggested by the commenters.

EPA did commit to consider "overburdened communities" as PESS in the TSCA Risk Evaluation Framework Rule, stating that each chemical risk evaluation would identify those communities or specific subpopulations that are relevant for that chemical. However, the requirements do not apply retroactively, and it was not practicable to do so for asbestos part 2 due to the timeframe for completing the risk evaluation. *See* 40 CFR 702.31(c). EPA encourages stakeholders to continue to engage with EPA during the prioritization and risk evaluation processes on individual chemicals to continue to share perspectives on this important topic and identify opportunities to incorporate more of these specific considerations. Although the population is not considered separately, the risk assessment is protective of "overburdened communities" such as those identified by the commenter.

Summary: A commenter (0071) stated that building occupants should be considered PESS, as their risk from past and current ACM exposure exceeds those of the PESS identified in the risk evaluation. The commenter stated that building occupants are often bystanders to consumer/DIY type activities and may be exposed to industrial-type activities. The commenter further expressed that the duration is long for many who work (e.g., government employees, teachers) and live in such buildings; so that cumulative

exposures are significant, particularly in light of the fact that, with the possible exception of asbestosis, no threshold dose has been shown for asbestos related diseases.

A union representing educators (0081) requested that education workers be consider a PESS. The commenter pointed to their special status under the AHERA regulations as support for identifying educators as PESS.

> **EPA Response:** Reasonably available information does not indicate that education workers or occupants of buildings with undisturbed, in-place asbestos are anticipated to have higher exposure to asbestos or be more susceptible to associated health effects. Therefore, educational workers and building occupants are not considered PESS for the asbestos part 2 risk evaluation. However, asbestos exposure for educational workers is considered both in the occupational assessment as ONUs and indoor air assessments. Other occupants of buildings with asbestos are covered under the indoor air, bystander, DIY, and general population assessments.

Summary: A commenter (0082) stated that the EPA's identification of PESS and risk analysis for vulnerable populations are inadequate and incomplete. The commenter stated that EPA must specifically address whether PESS face unreasonable risks and how large the unreasonable risk is. While the EPA named smokers and children as more susceptible to the health effects of asbestos than the general population, the commenter stated that EPA made no attempt to quantify the increase in risk. Two epidemiology studies (Cullen et al, and Markowitz et al) were cited as evidence of the higher risk of lung cancer and asbestosis of workers who smoke and work with asbestos. Furthermore, the commenter recommended using either relative risk (RR) differences between smokers and nonsmokers to calculate the higher risk of lung cancer or applying a 10X uncertainty factor (UF) to account for the higher risk to smokers per standard EPA Integrated Risk Information System (IRIS) methodology.

Regarding the susceptibility to children, the same commenter criticized the lack of effort to quantify or adjust risk estimates to account for early life exposure, stating that such analysis would not be difficult, as the presence of elevated asbestos levels in schools indicates higher exposures. The commenter recommended increasing quantitative estimates of cancer by factors of 3X or 10X because risk "generally are higher from early-life exposure than from similar exposure durations later in life."

> **EPA Response:** The EPA considered increased exposures and increased biological susceptibility to determine PESS, as summarized in Table 5-26 in the risk evaluation. The table also summarizes whether EPA believes the risk evaluation adequately addressed those factors in the risk characterization or otherwise. Thus, EPA has "consider[ed] all potentially exposed or susceptible subpopulation(s) determined to be relevant." in compliance with 40 CFR 702.39(d)(5).
>
> Regarding the susceptibility to children, EPA directly quantified exposures to children in the take-home, general population and consumer do-it-yourself activity-based consumer bystander exposure analysis by using the following inhalation unit risks (IURs), respectively: IUR(0,20), IUR(0,1), and lifetime. Thereby eliminating the need for suggested 3x or 10x uncertainty factors. Details on these calculations are available in the appendices and the supplemental risk calculator spreadsheets. As noted in the risk determination, children are a particularly susceptible subpopulation, as time since first exposure is known to be an important predictor of asbestos-related disease, see Section 5.2.2.1. As described in Section 5.1.1, the earlier an individual is exposed, the greater the risk due to the latency of asbestos-related disease. For example, onset of

cancer can take up to 40 years from exposure. For this reason, individuals who are first exposed during childhood are more likely to experience asbestos-related disease than those first exposed during adulthood.

Summary: A commenter (0082) stated that populations with non-cancer asbestos disease should be a PESS for lung cancer due to their higher susceptibility as evidenced in a hospital-based case-control study that observed a twofold increase in lung cancer risk in 93 patients with definite or probable occupational asbestos exposure and ILO radiographic profusion of small opacities of > 1/0 (odds ratio (OR) 2.03, 95% CI 1.00-4.13) (Wilkinson et al, 1995).

The commenter (0082) also stated that the EPA did not consider variables that contribute to higher risk for asbestos-related lung cancer and non-cancer lung disease in its PESS analysis although a number of them are more prevalent in environmental justice communities. The factors listed were family history, preexisting Chronic Obstructive Pulmonary Disease (COPD), and occupational or environmental exposure to other lung carcinogens (e.g., silica, radon).

EPA Response: While EPA did not classify the populations described in the comment as PESS the Asbestos Part 2 Risk Evaluation is protective of those populations, because those COUs that result in the disturbance of friable asbestos were determined to result in unreasonable risk.

EPA conducted a comprehensive literature search and systematic review to identify any chemical-specific human health hazard and exposure data to identify the asbestos-specific PESS outlined in Section 5.3.3 of the risk evaluation. For human health hazards, EPA also identified mechanistic and toxicokinetic data and summarized any PESS information in the asbestos risk evaluation. EPA similarly identified and summarized chemical specific PESS information resulting from the comprehensive exposure literature search.

As part of this process, the Wilkinson study identified by the commenter was excluded during systematic review due to having no quantitative exposure measurement. Additionally, the probability of someone having an adverse outcome was based on x-rays and not asbestos exposure, thus EPA could not determine from this study whether the group is considered PESS due to higher exposure levels. The Wilkinson et al 1995 study gave examples of occupations that could be potentially considered PESS but does not provide useful information to corroborate this assertion. Thus, this article does not provide any new information that would better inform the risk characterization for PESS.

Section 6 Human Health Hazard

6.1 Cancer Hazard

Summary: A commenter (0067) expressed concern that EPA may underestimate mesothelioma mortality due to under reporting. Given the relatively low number of mesothelioma cases, the commenter noted this implies that the IUR is not a conservative estimate of risk.

EPA Response: EPA acknowledges that determination of cancer risk is limited by the reported data. However, EPA accounts for that in its discussion of uncertainties in Section 5.2.1.2 of Risk Evaluation for Asbestos Part 2: Supplemental Evaluation Including Legacy Uses and Associated

Disposals of Asbestos. EPA considers the uncertainties associated with each condition of use, and how the uncertainties may result in a risk estimate that overestimates or underestimates the risk. Based on such analysis, EPA determines whether or not the identified risks are unreasonable. Such consideration carries extra importance when the risk estimates are close to the benchmarks for risks from acute and chronic non-cancer health effects and cancer. In the case of asbestos, a sensitivity analysis of a range of IURs did not alter the risk decisions. Therefore, EPA is confident that uncertainties in the determination of the IUR do not impact the risk determination.

Summary: A commenter (0070) disagreed with the IUR's representativeness for the varied potency of the 6 fiber types and LAA. The commenter does not feel there is sufficient justification for rounding to 0.2 f/cc.

Another commenter (0072) stated that using a single IUR for cancer is pragmatic, but inconsistent with the best available science. The commenter proposed that EPA use fiber-specific IURs. The commenter submitted a detailed analysis related to EPA's use of a single IUR and recommended EPA consider:

- explaining the Agency's selection of 0.2 per fiber/cc as a "representative value" for the cancer dose-response assessment (EPA 2024a, p. 148) despite a prior statement made by the Agency that, "Libby Amphibole Asbestos IUR and 1986 IUR are not directly comparable to each other or with IUR for commercial chrysotile derived in this Risk Evaluation," given differences in risk assessment and risk characterization methodologies (EPA 2020, p. 165);
- while the available IURs (0.23 per fiber/cc, 0.17 per fiber/cc, and 0.16 per fiber/cc) are apparently numerically similar, given that that the IUR values were derived based on data for different fiber types, this finding is inconsistent with significant literature demonstrating that there are substantial differences in potency among asbestos fibers.

Another commenter (0078) stated that EPA should evaluate the hazard of asbestos fiber types individually in order to comply with the TSCA mandate for using best available science. Previous EPA risk evaluations for asbestos are cited with a discussion of differences across fiber types.

Another commenter (0082) agrees with the decision to not differentiate between fiber types on the basis of carcinogenic potency and stated that this was in alignment with the 1989 ban on asbestos, and the conclusions reached by OSHA in 1986 and 1994. The commenter furthermore encouraged EPA to categorically reject proposals to set separate IURs for individual asbestos fibers based on claimed differences in toxicity as there is a long history of experts supporting equal potency for all asbestos types.

However, the same commenter (0082) disagreed with EPA's proposed IUR of 0.2 per fiber/ cc and reasoned that the IUR from the 1988 IRIS Asbestos risk of 0.23 per fiber/cc based on 14 epidemiologic studies that include occupational exposure to amphiboles, chrysotile, and mixed fibers should have been chosen. The commenter explained that this IUR reflects a risk estimate for a significant number of people who have mixed fiber type legacy asbestos exposures, and is based on actual calculations, not rounded. The commenter then explained that a higher IUR is preferable because the IUR is only based on dose-response information for lung cancer and mesothelioma and does not factor in laryngeal and ovarian cancer despite clear evidence of causality. Thus, a higher IUR would provide a small increment of added protection.

EPA Response: In response to these comments, a sensitivity analysis of the IUR was conducted, which determined that estimated cancer risk was not meaningfully different using 0.2 per fiber/cc vs. 0.23 per fiber/ccc or 0.16 per fiber/cc utilized in pervious EPA assessments of specific fiber types. Therefore, EPA utilized an IUR of 0.2 fibers/cc in the final risk evaluation.

The assessment of legacy uses of asbestos in the Asbestos Part 2 Risk Evaluation does not differentiate by fiber type in either the conditions of use, therefore, a fiber-specific IUR is not appropriate for this assessment. The IUR used in the risk evaluation is both protective and representative of the relative potencies across fiber types relevant to legacy exposure to asbestos. More detailed justification of the IUR selection is provided in Section 5 of the risk evaluation.

The IUR determination was included as part of the *White Paper: Quantitative Human Health Approach to be Applied in the Risk Evaluation for Asbestos Part 2 – Supplemental Evaluation including Legacy Uses and Associated Disposal of Asbestos*, which underwent letter peer review. Feedback from the peer review and public comments on the White Paper was incorporated into the final Asbestos Part 2 Risk Evaluation.

Summary: A commenter (0072) requested more support for the statement that standard practice is reporting IURs with precision to one significant digit, considering that EPA originally reported the available IURs to two significant digits (EPA 2024a).

EPA Response: In response to this comment, EPA has removed the statement regarding standard practice around IUR precision from the risk evaluation.

Summary: A commenter (0072) requests a more detailed description of how, if at all, the additional Wittenoom cohort was incorporated into the analysis.

Another commenter (0082) remarked that the most challenging task EPA faced was selecting epidemiology studies for dose-response assessment and using them to determine an IUR for carcinogenicity for the derivation of quantitative risk estimates for legacy asbestos COUs.

EPA Response: The systematic review protocol used for cohort selection was included as part of the *White Paper: Quantitative Human Health Approach to be Applied in the Risk Evaluation for Asbestos Part 2 – Supplemental Evaluation including Legacy Uses and Associated Disposal of Asbestos*, which underwent letter peer review. The protocol was revised in response to peer review feedback, which was generally supportive of the systematic review approaches used to identify cohorts clearly and reasonably.

The Witternoom cohort described by the commenter (0072) was considered in the risk evaluation, but ultimately not used to inform dose-response. The non-cancer point of departure (POD) was based on LPT, which is protective of mortality, the only non-cancer effect reported in this cohort. The selected IUR was based on the IURs in three previous EPA assessments and is protective of the cancer effects described in the Witternoom cohort.

Summary: An industry trade organization (0072) commented that whether and how a substance is classified as a carcinogen can depend on the criteria applied; and therefore, EPA should not re-iterate

conclusions related to carcinogenic potential from other authoritative bodies, but instead should independently evaluate the evidence and apply its own 2005 *Guidelines for Classification of Carcinogenic Potential* and descriptors to arrive at an EPA classification.

> **EPA Response:** Asbestos is widely recognized in the scientific community to be carcinogenic and has been classified accordingly by EPA in previous assessments. Therefore, EPA did not use the 2005 *Guidelines for Classification of Carcinogenic Potential* to assign a cancer classification. Notably, this was not a concern raised during peer review of the *White Paper: Quantitative Human Health Approach to be Applied in the Risk Evaluation for Asbestos Part 2 – Supplemental Evaluation including Legacy Uses and Associated Disposal of Asbestos.*

6.2 Non-cancer Hazard

Summary: A commenter (0057) stated that EPA's risk evaluation should consider additional non-cancer outcomes, including asbestosis and mortality. The commenter stated that sufficient information is available across the considered cohorts to conduct dose-response analysis on both outcomes. The commenter notes that in the case that unreasonable risk is determined, providing a more fulsome analysis of non-cancer outcomes could support risk management under TSCA section 6. The commenter states that EPA cannot determine the effects of asbestos on health without addressing asbestosis and recommends dose-response of pneumoconiosis and lung function changes as well.

A commenter (0072) stated that EPA should not use localized pleural thickening (LPL) as a non-cancer endpoint for Libby Amphibole Asbestos (LAA). This commenter states that a causal relationship between LPT and asbestosis, and LPT and mortality, has not been established. The commenter furthermore states that this endpoint cannot support a risk evaluation and the use of a 10% response rate for benchmark dose analysis and application of a 300x uncertainty factor are inappropriate. The commenter recommends that EPA not use LPT as a regulatory endpoint and asks EPA to consider if the Agency should consider if this endpoint is robust enough to meet the scientific standards for a TSCA risk evaluation. This commenter also states that beyond not using LPT as a non-cancer endpoint for LAA, it is inappropriate for EPA to consider LPT as a non-cancer endpoint for the other asbestos forms. The commenter submitted several studies containing information related to this comment for the Agency to consider. This commenter states that the Agency must revise the non-cancer portion oof the risk evaluation using more refined exposure estimates and a robust health endpoint demonstrably common to all asbestos forms, with fiber-specific toxicity values that reflect fiber-specific potencies, as necessary.

A commenter (0078) disagrees with EPA's identification of localized pleural thickening as the most sensitive non-cancer health effect. The commenter points to a systematic review paper (Kerper et al. 2015) on pleural plaques and lung function for support. The commenter notes that a publication from an EPA author used in the risk evaluation showed a weak correlation between pleural plaques and lung function.

A commenter (0067) expressed support for the identification of pleural disease as a critical non-cancer endpoint and the choice of epidemiological cohort used.

> **EPA Response:** EPA acknowledges differing opinions submitted by the public commenters regarding the selection of LPT as a sensitive endpoint for non-cancer hazard. EPA considers there to be sufficient evidence that pleural plaque (localized pleural thickening (LPT) is a precursor to

adverse lung function. Feedback on selection of this endpoint from peer review of the *White Paper: Quantitative Human Health Approach to be Applied in the Risk Evaluation for Asbestos Part 2 – Supplemental Evaluation including Legacy Uses and Associated Disposal of Asbestos* was incorporated into the risk evaluation (EPA-HQ-OPPT-2023-0309).

In the final risk evaluation, pleural plaques (LPT) forms the basis of the POD selection, because this endpoint is protective of other chronic conditions and mortality. LPT was selected as the critical effect for non-cancer endpoints for derivation of the non-cancer point of departure, because it is generally the first effect to appear after asbestos exposure and can occur at the lowest levels of exposure (most sensitive endpoint). Thus, risk estimates based on LPT should be protective of asbestosis and mortality. EPA notes that some individuals can develop diffuse pleural thickening (DPT) without the development of pleural plaque. LPT is a pathological change associated with decreased pulmonary function and thus is considered an appropriate adverse effect for deriving the RfC. Using an RfC derived from a non-lethal effect, such as pleural plaques, is protective of other adverse human health effects, including asbestosis and mortality.

Additionally, the use of LPT to derive a POD was based on the 2014 EPA IRIS assessment of LAA. Peer review by the Scientific Advisory Board (SAB) generally supported EPA's choice of LPT as a sensitive non-cancer endpoint. The EPA would like to clarify that non-cancer hazard was not assessed in the 2020 Part 1 Risk Evaluation of Chrysotile Asbestos.

The citation provided by a commenter (0078) is a systematic review paper that does not meet the systematic review criteria for inclusion in the assessment.

Summary: A commenter (0082) stated that EPA proposed to adopt a POD for non-cancer effects of 2.6×10−2 fiber/ cc based on dose-response data in the occupational cohort from the O.M. Scott plant in Marysville, Ohio as described in the Libby IRIS assessment for the first time, EPA made a quantitative non-cancer risk determination for all asbestos fibers and added an important dimension to its risk analysis.

EPA Response: EPA appreciates the support for the non-cancer POD of 2.6 x 10^{-2} f/cc.

6.3 General Comments on Hazard

Summary: A commenter (0082) stated that there is evidence of a causal connection between the presence of asbestos in drinking water and gastrointestinal cancers, and while it is not conclusive, there is ample reason for concern about this risk in light of the pervasive use of asbestos cement pipe in drinking water systems. The commenter urged the EPA to treat asbestos ingestion from asbestos cement pipe as a contributor to legacy asbestos risks, to assure that it will be addressed in a comprehensive risk management strategy.

EPA Response: EPA did not identify conclusive evidence of the adverse effects associated with asbestos exposure through drinking water, as acknowledged by the commenter. Studies evaluating adverse health effects from asbestos ingestion have found low correlations or undecisive results (ATSDR 2012, Polissar et al. 1983). Additionally, asbestos fibers ingested via the oral pathway will pass the digestive system and be excreted within a few days, while small

fibers may migrate to blood or other tissues before urinary elimination. Therefore, EPA does not consider the ingestion of asbestos fibers as a relevant exposure pathway for establishing risks related to asbestos exposure.

Summary: A commenter (0082) stated that the agency declined to conduct a quantitative dose-response analysis for ingestion routes of exposure based on limited information for these exposures. However, the commenter requested that EPA treat asbestos ingestion from asbestos cement pipes as contributors to legacy asbestos risk, while noting the limitations in the data. The commenter stated that there is evidence of gastrointestinal malignancies from asbestos ingestion and cited the MCL set by EPA in 1982 of 7 million fibers per liter (MFL) based on concern about the risk of developing benign polyps from deterioration of asbestos cement water infrastructure. The commenter reported exceedances of the MCL in some municipalities and stated that while the amount of asbestos contributed from asbestos cement pipes is negligible in some locations, in other locations it may result in concentrations of 1-300 MFL.

EPA Response: EPA did not identify reasonably available information to support a quantitative dose-response analysis for ingestion through systematic review, peer review of the *White Paper: Quantitative Human Health Approach to be Applied in the Risk Evaluation for Asbestos Part 2 – Supplemental Evaluation including Legacy Uses and Associated Disposal of Asbestos*, or public comment.

Summary: A union representing educators (0081) expressed support for consideration of both cancer and non-cancer effects from all relevant routes of exposure.

A commenter (0082) agrees that EPA's identification of asbestos's cancer and non-cancer effects is supported by the weight of scientific evidence and aligned with the many previous determinations by leading experts and public health bodies.

EPA Response: EPA appreciates the support for the risk evaluation of cancer and non-cancer effects, included in the Asbestos Part 2 Risk Evaluation.

Summary: A commenter (0068) discussed the uncertainties and calculations used to determine the margin of exposure (MOE) and the Excess Lifetime Cancer Risk (ELCR). The commenter expressed hope that studies evaluating the human health hazard effects of oral and dermal asbestos exposure would be identified in the public comment period.

EPA Response: EPA acknowledges the comment regarding MOE and ELCR calculations and notes that Section 5 of the Asbestos Part 2 Risk Evaluation describes uncertainties in the risk characterization. No additional oral or dermal studies have been identified to fill that data gap for oral or dermal asbestos exposure through public comments.

Summary: A commenter (0065) disagreed with EPA's use of the 2014 IRIS assessment of LAA. A copy of comment submitted for the asbestos part 2 scoping document was provided outlining the primary concerns with the 2014 IRIS assessment of LAA: outmoded and weak weight-of-evidence (non-cancer),

lack of transparent causation assessment (non-cancer), improper model selection (RfC and IUR), and a sub-chort of only 12 cases for the RfC.

> **EPA Response:** Like earlier benchmark dose modeling efforts, LAA analysis uses high-quality data from a longitudinal study of workers with 30 years of follow-up, in which a sensitive method (HRCT/CT) was applied to characterize pleural change outcomes. EPA conducted preliminary updated estimated BMDLs using Bayesian Model Averaging (BMA), an agnostic approach that avoids imposing user decision-making to select a single model form. This analysis examines the consistency of BMA findings with pervious results from frequentist modeling approaches.
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> The BMA approach was applied to data published by Lockey et al 2015 (HEROID 3014803), which closely resembled data Benson et al 2015 (HEROID 3077678) in which the previous BMDLs were derived. Both studies included pleural plaques identified using HRCT/CT examinations after 30 years of follow-up. Benson et al. (2015) integrated time since first exposure (TSFE) in the analysis. However, the BMA approach could not include TSFE (Used in LAA) since neither publication presented population and case counts jointly classified by both TSFE and cumulative fiber exposure (CFE). In addition, statistical methods for BMA benchmark dose models which take covariates into account are not yet well-established and have not been integrated in EPA's BMDS.
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> Although TSFE was not integrated in the BMA approach, the results provide support that the BMA approach yields a BMCL consistent with findings from LAA. Using data derived from the same study, the BMCL for localized pleural thickening (LPT) estimated in Benson et al. (2015) was 0.0015 fiber cc-years, while the BMA BMDLs ranged from 0.0067 to 0.0119 fiber cc-years depending on the different population subsets. The consistency of findings based on the Bayesian approach, which does not impose assumptions on model form, raises confidence in estimated lower limits for a benchmark dose of cumulative exposure <0.01 fiber cc-years.
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> Finally, the 2014 EPA IRIS assessment of LAA was subject to peer review by the Scientific Advisory Board (SAB) with feedback incorporated into the final assessment. Additionally, EPA solicited feedback on the use of the LLA IRIS assessment in the Asbestos Part 2 Risk Evaluation during peer review of the *White Paper: Quantitative Human Health Approach to be Applied in the Risk Evaluation for Asbestos Part 2 – Supplemental Evaluation including Legacy Uses and Associated Disposal of Asbestos,* which was incorporated into the risk evaluation (EPA-HQ-OPPT-2023-0309).

Section 7 Human Health Risk Characterization

Summary: A trade organization (0056) expressed agreement with EPA's preliminary determination that mining activities and the various industrial/commercial/consumer conditions of use of vermiculite do not "contribute to unreasonable risks of cancer and non-cancer health effects". To support that, the trade organization provided information on what it considers an effective best practices program with an asbestos standard of ≤ 0.01%. Additionally, the trade organization stated an opinion that vermiculate provides a non-toxic alternative to Libby vermiculate, which it considers a geologic anomaly.

> **EPA Response:** The EPA appreciates the support of the risk determination for mining, as well as the additional information on best practices currently utilized within the vermiculite mining and milling industry.

Summary: An industry trade organization (0072) was concerned that EPA calculated a draft occupational exposure value (OEV) of 0.004 fiber/cc for inhalation exposures to asbestos as an 8-hour time weighted average for workplace setting. The commenter then notes that the value is based on an assumption that different asbestos fibers have similar potency despite literature showing there are differences in potency among fiber types. The commenter then notes the existing chemical exposure limit (ECEL) for chrysotile asbestos of 0.005 f/cc which is different from the OEV and creates uncertainty in which value to apply. Additionally, the commenter notes that although it may be possible to measure concentrations of airborne fibers at or below the 8-hr TWA OEV, it is not practicable to do so at that level given analytical limitations, sample equipment/media constraints, contributions from background sources, and typical worker task exposure scenarios. Furthermore, this commenter states that the OEV is not based on best available science and should not be included in the risk evaluation.

A commenter (0070) raised concerns about the occupational exposure limit (OEL), in this case actually referring to the OEV, as lower than background levels of asbestos in air from some monitoring studies.

> **EPA Response:** The EPA is confident in the determination of an occupational exposure value of 0.004 fibers/cc. As stated in the Appendix P, the occupational exposure value is the concentration at which the extra cancer risk is equivalent to the benchmark risk of $1x\ 10^{-4}$ per Equation Apx P-1. This existing chemical occupational exposure value is intended to summarize the occupational exposure scenario and sensitive health endpoints into a single value. TSCA requires risk evaluations to be conducted without consideration of cost and other non-risk factors, and thus this occupational exposure value represents a risk-only number. Any ECEL used for occupational safety risk management purposes could differ from the occupational exposure value presented in this appendix based on additional consideration of exposures and non-risk factors consistent with TSCA section 6(c).

Summary: A commenter (0082) stated that the estimates to quantify the populations at risk are buried in an appendix to the draft risk evaluation, and that these risks are incomplete, and not translated into understandable top-line numbers.

> **EPA Response:** The risk characterization provided in body of the risk evaluation provides information to a more general audience for each population assessed and flow clearly into the risk determination. The appendix is designed to provide supporting documentation for a technical audience.

Section 8 Unreasonable Risk Determination

Summary: Six commenters (0061, 0067, 0068, 0069, 0081, and 0082) expressed support for EPA's preliminary determination of unreasonable risk.

A commenter (0061) expressed support for EPA's determination that legacy uses and disposal of asbestos conveys and unreasonable risk of injury to human health and recommended swift action to mitigate exposure. The commenter summarized EPA's history of asbestos regulation under the Toxic Substances Control Act (TSCA). The commenter pointed towards exposure data from OSHA indicting that asbestos exposure occurs. A discussion of asbestos hazard findings from the US Centers for Disease Control

(CDC), US Department of Health and Human Services (HHS), and the World Health Organization (WHO) was also provided.

A commenter (0067) expressed support of the overall unreasonable risk findings of the draft asbestos part 2 risk evaluation. The association expressed support for the EPA's decisions to utilize the risk estimates for chrysotile and Libby Amphibole asbestos from the part 1 asbestos risk evaluation.

A commenter (0068) concurred with EPA's preliminary determination that asbestos as a whole chemical poses an unreasonable risk to human health and the classification of COUs. The comment expressed support for a single unreasonable risk determination (across parts 1 and 2 of the asbestos risk evaluation) due to benchmark exceedances for multiple conditions of use spanning the asbestos life-cycle and the risk of severe health effects associated with chronic inhalation exposure.

A commenter (0069) expressed support for a single risk determination for asbestos.

A commenter (0081) expressed support for EPA's determination that legacy asbestos poses unreasonable risks to the health of workers, handlers of asbestos-contaminated clothing, consumers, bystanders, and the general population.

A commenter (0082) strongly supports EPA's preliminary determinations of unreasonable risk.

> **EPA Response:** EPA appreciates the support for the unreasonable risk determination for asbestos.

Summary: A commenter (0060) requested that EPA find that all COUs contribute to unreasonable risk, because there is no safe level of exposure to asbestos. The commenter discusses the implications for risk management, including requiring testing of imported goods. Suggestions for risk management are provided regarding analysis of PPE usage and consideration of emergency responders.

A commenter (0082) urged the EPA not to identify the seven COUs that do not contribute to the whole chemical unreasonable risk of asbestos and recommended instead that all COUs for which there is evidence of potential exposure be included in its unreasonable risk determination. The commenter stated that the determination of no unreasonable risk undermined EPAs statement in the comprehensive ban of the 1989 TSCA rule that risk management measures that focus on individual COUs in isolation from all pathways of exposures will fail to address the full magnitude of the risks asbestos presents. The commenter stated that there is no safe level of exposure to asbestos, that exposures occur via multiple pathways, and that COUs may contribute significant risk when combined with other sources of exposure. The commenter provided an example of asbestos containing crayons that may be broken, mouthed, and swallowed by children, and that children may have multiple other sources of asbestos exposures. The commenter stated that this will avoid narrowing risk management options unnecessarily and enable EPA to consider a broad range of effective risk reduction strategies during its rulemaking process.

> **EPA Response:** In response to similar comments during peer review of the *White Paper: Quantitative Human Health Approach to be Applied in the Risk Evaluation for Asbestos Part 2 – Supplemental Evaluation including Legacy Uses and Associated Disposal of Asbestos* (EPA-HQ-OPPT-2023-0309), EPA utilized both quantitative and qualitative analysis in risk characterization in the final Asbestos Part 2 Risk Evaluation. Identifying studies with quantitative exposure data during the systematic review process allows the Agency to determine which are most relevant and useful for the development of the risk evaluation. The weight of scientific evidence was

considered within the risk evaluation, utilizing the best available data and outlining uncertainties in the underlying analysis. Ultimately, the Asbestos Part 2 Risk Evaluation determined that those COUs that result in the disturbance of friable asbestos lead to unreasonable risk.

The final risk evaluation lists the conditions of use that do not significantly contribute to the unreasonable risk based on reasonably available information. The proposed risk management requirements may select from among a suite of risk management options related to manufacture, processing, distribution in commerce, commercial use, and disposal to address the unreasonable risk. For example, if the consumer use of asbestos significantly contributes to the unreasonable risk of asbestos, EPA could propose to regulate upstream at manufacture (import) to prevent downstream risk to consumers.

Summary: A commenter (0072) noted that the Agency makes a single unreasonable risk determination for asbestos as a chemical substance that includes both the conditions of use evaluated in the 2020 risk evaluation for Asbestos: Part 1: Chrysotile Asbestos, and this risk evaluation; however a single risk determination for a chemical that does not reflect conditions of use creates a disconnect with how people commonly think about or understand the risk. The commenter states that the Agency must clearly delineate the differences in risk associated with different conditions of use in any Agency communications and follow this through in any future risk management actions.

EPA Response: As explained in the *Procedures for Risk Evaluation Under the Toxic Substance Control Act* (89 FR 37028, May 3, 2024) EPA interprets TSCA section 6(b)(4)(A) to require EPA to make a single risk determination for the chemical substance under its conditions of use, following the conclusion of the risk evaluation. In the risk determination of the final Asbestos Part 2 Risk Evaluation, EPA identified which conditions of use significantly contribute to the unreasonable risk of asbestos. The proposed risk management requirements will focus on one or more of the conditions of use significantly contributing to the unreasonable risk. However, EPA may select from among a suite of risk management options related to manufacture, processing, distribution in commerce, commercial use, and disposal to address the unreasonable risk.

Summary: A commenter (0059) sought EPA confirmation that chrysotile asbestos sheet gaskets used for processing nuclear material at the Savannah River Site (SRS) will not be considered legacy ACM (including disposal) until January 1, 2038 (40 CFR 751.509(c)(ii)). The commenter asserts that the risks presented in the draft RE for the applicable COUs do not accurately reflect how Savannah River Site (SRS) manages and disposes of ACM.

The commenter (0059) asserts that the Industrial/Commercial use of Legacy ACM and Disposal of Legacy ACM use at SRS do not present unreasonable risk to its workers, occupational non-users, consumers, or bystanders due to the existing programs and procedures in place. The risks presented in the draft RE for the applicable COUs do not accurately reflect how SRNS manages and disposes of ACM. Commenter notes that SRS is an industrial facility that uses PPE and established work practices when disturbing and disposing of legacy ACM and provides details on work practices and state and federal regulations governing asbestos procedures. SRNS also notes that radioactive asbestos waste is subject to more restrictive and protective standards due to the radiological hazards. SRNS notes EPA's use of high-end risk estimates to address situations where workers are hired to perform home renovation work and

may not be subject to regulation or follow work practices to reduce asbestos exposure, and states this use of high-end risk estimates is inappropriate for industrial/commercial operations such as SRNS that have demonstrated compliance with OSHA and state regulations, and that have established Workplace Chemical Protective Programs in place.

> **EPA Response:** The Asbestos Part 1 final rule published on March 28, 2024, allows the ongoing commercial use of chrysotile asbestos sheet gaskets for processing nuclear material at the Savannah River Site until December 31, 2037. The Asbestos Part 2 risk evaluation and subsequent risk management actions for legacy asbestos uses will not revisit this use at the Savannah River Site that has been addressed by the Part 1 regulation.
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> As discussed in Sections 6.2.1.2 and 6.2.1.3 of the draft risk evaluation, EPA believes it is appropriate to evaluate the levels of risk present in baseline scenarios where PPE is not assumed to be used by workers; although the Agency does not question the information received regarding the occupational safety practices often followed by many industry respondents, including the information provided by SRNS. Making unreasonable risk determinations based on the baseline scenario without assuming PPE should not be viewed as an indication that EPA believes there are no occupational safety protections in place at any location or that there is widespread noncompliance with applicable OSHA standards. As stated in Section 6.1 of the risk evaluation, "Not assuming use of PPE reflects the Agency's recognition that unreasonable risk may exist for subpopulations of workers that may be highly exposed because they are (1) not covered by OSHA standards; (2) their employers are out of compliance with OSHA standards; (3) many of OSHA's chemical-specific permissible exposure limits largely adopted in the 1970s are described by OSHA as being "outdated and inadequate for ensuring protection of worker health" ; or (4) EPA finds unreasonable risk for purposes of TSCA notwithstanding OSHA requirements." Similarly, as discussed in the executive summary of the draft risk evaluation, EPA's high-end estimates are intended to cover those situations where existing regulations do not apply. That is why there are high-end estimates that exceed EPA's standard risk benchmarks: Existing regulations, while assumed to be effective at reducing exposure, do not cover all activities considered in this risk evaluation. EPA will consider occupational safety practices and regulatory requirements at SRNS, including disposal requirements, during the development of any risk management procedures to address unreasonable risk identified in the final risk evaluation.

Section 9 Systematic Review

Summary: A commenter (0067) disagreed with EPA systematic review criteria for excluding older exposure studies The commenter expressed an opinion that samples collected in the 1970s may be representative of tasks performed in current occupational or non-occupational uses. Additionally, the commenter noted studies conducted before 1980 were not conducted in the sphere of litigation around asbestos. In contrast, the commenter stated that EPA should not rely on "simulation studies" of exposure from asbestos friction products, because these studies "are often done solely for the purpose of building a defense in litigation, with the intent to show that exposures were much lower than was measured contemporaneously with the tasks."

Two commenters (0071, 0082) stated that EPA's systematic review did not search for monitoring data prior to 2000 and was limited to United States and Canadian studies. The commenters emphasized that there is no reason to believe that older data or asbestos levels measured outside North America would

lack relevance to current conditions in US buildings. Because of the limitations of its systematic review, EPA likely overlooked data sources that could have contributed to quantitative exposure assessment of building occupants. The comment also pointed to several references that they state were not mentioned in the draft risk evaluation, these include a compendium of papers from the *Annals of the New York Academy of Sciences* entitled "The Third Wave of Asbestos Disease: Exposure to Asbestos in Place. Public Health Control" and a Health Effects Institute-Asbestos Research (HEI-AR) report entitled "Asbestos in Public and Commercial Buildings: A Literature Review and Search of Current Knowledge."

> **EPA Response:** EPA limited consideration of general population and indoor air exposure studies of asbestos to those published on or after 2000 in order to ensure the use of data that best represents current asbestos fiber releases within the US. For additional information on how systematic review approaches were implemented, please see the Systematic Review Protocol for the Risk Evaluation for Asbestos Part 2: Supplemental Evaluation Including Legacy Uses and Associated Disposals of Asbestos.

Summary: A commenter (0066) suggested EPA consider additional sources of information to evaluate sources of asbestos in water. The commenter identified compliance monitoring data submitted to EPA by public water systems (PWSs) as an important source of data, which the commenter believes reflects actual observations from distributed drinking water, is a large dataset of high-quality data per agency guidance, and readily available. The commenter also recommended EPA clarify how it used data collected by states regarding the Human Health Criteria for asbestos, under the Clean Water Act, which are available to EPA through WQX. The commenter noted that it is not clear how EPA selected WQX data to inform its wastewater analysis because the risk evaluation appears to only include information from four U.S. wastewater systems with documented asbestos discharges.

> **EPA Response**: EPA had sufficient information on asbestos exposure in water to complete part 2 of the risk evaluation using a weight of scientific evidence approach, and therefore did not update the assessment to include the recommended PWSs monitoring data. When preparing this risk evaluation, EPA obtained and considered reasonably available information, defined as information that EPA possesses, or can reasonably obtain and synthesize for use in risk evaluations, considering the deadlines for completing the evaluation.
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> EPA used the WQX data and labeled it STORET in the assessment that had asbestos fiber concentrations reported. Section 3.3.2.1 of the risk evaluation provides the description on how all the EPA water databases were used and reported in this assessment.

Summary: A commenter (0070) raised concerns that the National Institute for Occupational Safety and Health (NIOSH) 1980 reference should not be construed to represent agency policy or determination.

A commenter (0072) commented that EPA did not consistently apply its data quality criteria for occupational monitoring data. The commenter states that the Agency used OSHA's Chemical Exposure Health Data datasets for many of the exposure assessments, although these datasets did not provide any information on task, job title, or sampling location. The commenter states that EPA's use of these datasets in exposure assessments should not be ranked as "robust" or "moderate" when used as a significant source of data, per the 2021 draft systematic review protocol. The commenter criticized the data quality evaluation of OSHA datasets that were used. The commenter stated that EPA was not consistent in its

application of its data quality evaluation for monitoring data as described in the 2021 Draft Systematic Review Protocol.

A commenter (0082) stated that EPA's risk estimates for occupational COUs derive from an incomplete database and disproportionately emphasize unrepresentative studies that understate likely levels of exposure and risk. The commenter cited a 1975 internal corporate memo from a former asbestos flooring manufacturer with personal sampling data that indicates higher asbestos exposures during tile removal than EPA suggests. The commenter recommended that EPA draw on broader studies, give less weight to OSHA and NIOSH data, flawed industry studies, and studies in which measured exposure levels reflect the use of PPE and clarify the impact of different sampling and analytical methods on representativeness of data.

> **EPA Response:** EPA has considered a broad range of studies to estimate exposure levels, including studies that date back nearly 50 years. Though practices have changes significantly over that time, EPA agrees that it is important to characterize exposures over a broad range of scenarios. Though data from OSHA and NIOSH may have limitations, all data undergoes evaluation based on the *Draft Systematic Review Protocol Supporting TSCA Risk Evaluations for Chemical Substances*(U.S. EPA, 2021). Relevant data were assigned an overall quality determination of high, medium, or low. The sampling and analytical methods used in a study are rated under one metric which is assigned as high, medium, low, or unacceptable. There are six other metrics also considered in the evaluation of worker monitoring data, and all metrics are used to determine the overall rating for a data element. Thus, a low rating on a single metric does not guarantee an overall low confidence determination. Any uncertainties are appropriately characterized in the risk evaluation. One commenter (0072) suggests inconsistency in the protocol's application to the occupational monitoring data but does not provide an example of such inconsistency.

Summary: A commenter (0065) expressed concerns about the quality and range of exposure data from the single publication (Ewing et al 2010) utilized for the loose-fill insulation exposure scenario.

> **EPA Response:** Consistent study quality metrics were applied to the Ewing et al 2010 study to determine the rate of "Medium" as outlined in *Draft Systematic Review Protocol Supporting TSCA Risk Evaluations for Chemical Substances* (U.S. EPA, 2021). EPA considers all reasonably available data for assessments.

Summary: Two commenters (0071, 0082) state that EPA disregarded numerous studies in the literature reporting malignant mesotheliomas (MM) and other asbestos-related diseases in occupants of public and commercial buildings and schools, as well as health care facilities with friable ACM. One commenter (0082) stated that it is unclear whether EPA failed to identify these studies or was aware of them but chose not to discuss them, but that the studies provide strong qualitative evidence of the causal connection between damaged and deteriorated ACM in schools and other buildings and asbestos-related death and disease on the part of building occupants.

> **EPA Response:** EPA reviewed all of the references provided by the commenters. The two newest citations provided (Ruderman 2018 and Savage 2023) were not identified in previous review or public comment. However, these newspaper articles detailing asbestos exposure in a

Philadelphia school and English hospital did not meet the systematic review criteria for inclusion in the risk evaluation. The remaining references identified through the public comments were previously identified in literature searches for Part 1 or Part 2 or through public comments on the Part 1 Risk Evaluation and screened according to the *Systematic Review Protocol for the Risk Evaluation for Asbestos Part 2: Supplemental Evaluation Including Legacy Uses and Associated Disposals of Asbestos*.

Summary: A commenter (0082) listed different reports that were not included in the risk evaluation: Health Effects Institute-Asbestos Research (HEI-AR) report entitled *Asbestos in Public and Commercial Buildings: A Literature Review and Search of Current Knowledge* and Annals of the New York Academy of Sciences entitled *The Third Wave of Asbestos Disease: Exposure to Asbestos in Place. Public Health Control.*

EPA Response: Both of the suggested references were captured as part of the literature searches for Part 1 and/or Part 2 of the Asbestos Risk Evaluation and screened according to the criteria outlined in the *Draft Systematic Review Protocol Supporting TSCA Risk Evaluations for Chemical Substances* (U.S. EPA, 2021). The *Asbestos in Public and Commercial Buildings: A Literature Review and Search of Current Knowledge* reference was categorized as Supplemental – Secondary Source / Review in Part 1. The conference proceedings provided in *Third Wave of Asbestos Disease: Exposure to Asbestos in Place. Public Health Control* were screened individually in Part 2.

Summary: A commenter (0077, 0082) stated that EPA mostly used monitoring databases from NIOSH and OSHA, which are likely not representative of actual workplace conditions. The commenter said that employers typically have prior knowledge that monitoring would be conducted. The commenters emphasized that work practices are altered when workers know they are being observed, and that the EPA acknowledged this in the draft risk evaluation. One commenter (0082) recommended accessing data from state abatement programs, EPA regions enforcing AHERA or National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements, and independent research predating 2000.

EPA Response: Though data from OSHA and NIOSH may have limitations, all data undergoes evaluation based on the *Draft Systematic Review Protocol Supporting TSCA Risk Evaluations for Chemical Substances* (U.S. EPA, 2021) and is incorporated into the risk evaluation consistent with the best available science. The commenter provides general recommendations for an expanded search of sources but does not provide specific citations.

EPA is required under TSCA to consider all reasonably available information, so it is reasonable for EPA to rely on NIOSH and OSHA data in the risk evaluation.

Summary: A commenter (0082) stated that the EPA made no effort to screen out studies of workers using PPE to give less weight than studies in which workers did not use PPE, even though EPA's policy is to base its unreasonable risk determination on exposure measurements that reflect the absence of PPE.

EPA Response: While it is not always possible to determine if PPE was used based on the study report, the use of PPE would not affect results of personal breathing zone data (PBZ) and area

monitoring data. For instance, a worker may be wearing a respirator during asbestos handling for self-protection, while also wearing a PBZ monitoring device on the body. The PBZ device can detect any asbestos in the air, while the worker is potentially protected by the respirator, and this does not impact the air monitoring results. EPA assumes that the worker may be exposed to the concentration in the air sample from the PBZ or area monitoring devices for risk determination rather than the potential exposure to the worker wearing a respirator.

Summary: Two commenters (0077, 0082) raised concerns about the data EPA used to assess worker exposure during the COU for "use, repair, or removal of appliances and machinery that contain asbestos" The commenters stated that the OES describes work with gaskets, packing, industrial brakes and clutches, and reinforced packing and that one of the cited studies, (Madl ,2015) is a gasket and packing simulation study. The commenter asked "Why not rely on, or at least include, a broader set of studies where conditions of asbestos exposure in use of these materials was characterized? Consider Cheng (1991), Millette (1993), Longo (2002), and McKinnery (1992)."

EPA Response: During use, repair, or removal of appliances or machinery, workers may be exposed to asbestos from legacy gaskets. However, EPA estimated occupational exposure to asbestos from gasket removal and handling in the *Risk Evaluation for Asbestos Part 1: Chrysotile Asbestos* and this estimate extends to the removal and handling of legacy gaskets. For occupational exposure estimates associated with legacy gasket removal and handling, please see the *Risk Evaluation for Asbestos Part 1: Chrysotile Asbestos*. The Cheng 1991 reference was not identified in the literature search, but the data fall within the range of what was considered in previously identified references. Therefore, it was not used quantitatively in the risk evaluation. The other references provided were captured in the systematic review process for Asbestos Part 1 or Part 2 and considered accordingly.

Summary: One commenter (0077) criticized the three studies EPA used to obtain data to address the OES "handling articles or formulations that contain asbestos"**.** The commenter stated that the three studies (Brorby (2013), Garcia (2018), and Lange (2006)) used to estimate the relevant exposures are not informative for various reasons.

1. The Brorby study uses modeling data although the EPA prefers monitoring data;
2. The Lange et al study sampled ACM materials during abatement activities, but the ACM materials were never measured, nor the measurement method cited, and the detection limit of the personal and area sampling method was 0.1 f/cc so virtually all of the sample results were below the level of detection.

The commenter stated that these studies demonstrated scientific deficiencies and does not represent typical conditions for workers managing legacy asbestos.

EPA Response: Though the three studies described by the commenter (Brorby et al. 2013), Garcia et al. 2018), and Lange et al. 2006)) may have limitations, there are several variables that affect the quality of an inhalation monitoring study and these studies were determined to have either "high" or "medium" through EPA's systematic review process. Therefore, the studies were considered informative to the risk assessment.

Though Brorby et al. (2013) describes a new modeling procedure, the study also summarizes existing data related to hand/pole sanding. Specifically, the study states "[t]o assess performance of the new procedure, available fiber concentration measurements for workers historically sanding asbestos-containing joint compound were statistically characterized based on data reported as summary statistics in three studies (Table II). These historical samples were collected on open-face cassettes and should therefore be considered total PCM-fiber concentrations." Therefore, EPA has not relied on modeled estimates by the use of Brorby et al. (2013).

Section 10 Other Comments

10.1 Mining

Summary: A commenter (0070) expressed support for the qualitative assessment of mining of non-asbestos commodities used to determine that this COU does not contribute to unreasonable risk. The commenter supported this with description of MSHA regulations, personal air monitoring data, avoidance practices in mining, geological references, and TRI data.

EPA Response: EPA appreciates the support of the qualitative risk determination for mining.

Summary: A commenter (0070) requested that EPA refer to asbestos as an impurity for industrial bulk materials and acknowledge that most commercial talc and vermiculite are not co-located with asbestos.

EPA Response: An analysis of asbestos in trace amounts of mined materials was added to the risk evaluation to expand on the description and evaluation risk based on available data of current mining practices and products, including commercial talc and vermiculite. The Agency did not assess exposures from asbestos unintentionally present in trace amounts in products that are not subject to TSCA, such as personal care products with talc containing asbestos.

10.2 Building Surveys

Summary: A commenter (0060) noted that a survey of asbestos in schools, government buildings, residential properties, and commercial buildings has not been conducted since 1985 and recommends EPA analyze these more in depth. The commenter suggested EPA work with other federal agencies to consider how census data combined with knowledge of legacy asbestos uses could be used to estimate these potential exposures across different regions and populations to support environmental justice. The commenter includes a table summarizing US Census Bureau data from 2020 showing 50% of US housing units were built prior to 1980 (submitted as comment 0080).

Two commenters (0071, 0082) stated that EPA gave short shrift to ACM in buildings as a source of exposure leading to lung cancer, mesothelioma, and non-cancer disease. The commenters stated that the lack of recognition of the risks to building occupants will lead to the failure by EPA to protect a large potentially exposed and susceptible population from unreasonable risk.

One commenter (0082) stated that the draft risk evaluation failed to meet the need for a comprehensive and transparent picture of the prevalence of legacy asbestos in the country (number of buildings, types of buildings affected, how many people inhabit and frequent buildings with legacy asbestos). The

commenter recognized that EPA conducted a survey of the presence of friable ACM in 1984 and although the commenter noted some flaws, stated that Part 2 draft does not discuss or analyze these reports, nor does it identify new data that would update their findings. One commenter (0082) supported their statement by stating that EPA used the Bureau of Labor Statistics (BLS) and the U.S. Census' Statistics of U.S. Businesses (SUSB) sources to estimate each ACM occupational exposure scenario, but that these projections are highly uncertain and fail to include large portions of the building universe (such as occupied buildings that are not active construction sites but have damaged ACM and schools in which teachers and students are exposed continuously to asbestos). The commenter stated that although the estimates of ACM-exposed populations are large in the Part 2 draft risk evaluation, they are still dramatically understated because they do not include occupants of ACM-containing commercial and residential buildings, teachers and students in ACM-contaminated schools, DIY consumers, families with take home exposure and members of the public exposed to indoor or outdoor air with elevated asbestos levels.

> **EPA Response:** EPA utilized existing building surveys to provide an estimate of a reasonable upper bound of asbestos exposure. EPA used a building survey from the late 1980s that estimated 20 percent of buildings contain friable asbestos (U.S. EPA 1988) to inform the estimate of asbestos in U.S. commercial and public buildings. Although the building survey was conducted decades ago, it provides a reasonable upper bound, given that use of asbestos in construction materials has been drastically reduced since that time. EPA used BLS and SUSB data for estimating the number of workers, and establishments for those workers, for some occupational exposure scenarios, which represents the best reasonably available data.
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> EPA considered emissions of asbestos fibers when asbestos materials were modified in some form (*e.g.*, renovation of asbestos containing materials). The fibers released during those activities were used to estimate exposure concentrations and risk. Data gathered during systematic review, which included schools, offices, public buildings, and residential locations, shows that in the absence of asbestos modifying activities, indoor asbestos concentrations were non-detects or below detection limits. While asbestos containing materials may deteriorate over time, the indoor data used by EPA do not identify measurable fibers. Moreover, these data do not result in detectable fiber concentrations from the processes of cleaning and ventilation in these indoor environments. In this assessment, EPA estimated risk from take-home exposures to various age groups, DIYers, and the general population by COU to develop risk determinations that are protective of this range of activities.

10.3 Peer Review and Public Engagement

Summary: A commenter (0078) described the peer review process for the white paper and expressed concern that it is not sufficient peer review. The commenter noted that EPA had not responded to the comments received on the white paper. They also stated that because it was published separately the public was "not able to appreciate the aggregate effect of the numerous erroneous assumptions in the White Paper, which only come into full view with the release of the draft Risk Evaluation." They also asserted that a "letter peer review" was not appropriate for the white paper.

A commenter (0082) stated that EPA's approach to peer review is in sharp contrast to Part 1 and numerous other risk evaluation under TSCA, on which SACC conducted a transparent and rigorous peer review. The commenter stated that the risk evaluation has serious flaws, and that a robust peer review

process with stakeholder engagement and engagement of the scientific community would strengthen the final risk evaluation necessary to address the complex scientific challenges posed by Part 2 (i.e., larger and more diverse exposed worker and consumer populations, numerous pathways of releases and exposures**).**

> **EPA Response:** EPA maintains that the peer review requirements under TSCA were satisfied by the White Paper peer review. Specifically, an ISA letter peer review of the White Paper both followed EPA's guidance for peer review and represented the most judicious use of Agency resources for meeting the peer review needs. The methods used to estimate exposure in the risk evaluation are well established. The combination of hazard and exposure to determine risk falls outside of the scope of peer review of the underlying science.
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> EPA notes that, under the OMB's Information Quality Bulletin for Peer Review, Agencies also have "broad discretion in determining what type of peer review is appropriate." As explained in the Risk Evaluation Framework Rule (EPA-HQ-OPPT-2023-0496) EPA expects that, risk evaluations may use previously peer reviewed scientific approaches, models, and/or methods for similar chemicals or exposure scenarios. In these cases, peer review can focus on the novel information, applications, and analysis that will benefit from independent, expert peer review.
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> EPA's use of a letter peer review is consistent with EPA's 2015 Peer Review Handbook (4th Edition; herein called the Handbook). *Letter review by individual independent experts from outside the Agency* is provided as an option in Section 4.4. Specifically, Section 4.4 states that letter reviews are more appropriate than other types of external peer reviews when the topic of review "covers only a few disciplines" (p.57). In the case of asbestos, the white paper included only a single discipline—human health toxicology. EPA continues to believe that the letter peer review conducted for asbestos was appropriate and provided constructive and critical comments on issues related to asbestos human health hazard extrapolation and quantification.
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> Additionally, the LLA IRIS assessment and the Asbestos Part 1 Risk Evaluation under TSCA that were used to inform the Asbestos Part 2 Risk Evaluation under TSCA were both subject to full peer review panels.
>
> A response to comments from White Paper: Quantitative Human Health Approach to be Applied in the Risk Evaluation for Asbestos Part 2 – Supplemental Evaluation including Legacy Uses and Associated Disposals of Asbestos is in a separate document on the associated docket (EPA-HQ-OPPT-2023-0309).

Summary: A commenter (0082) stated that EPA failed to assure meaningful public engagement and that EPA made no effort to conduct outreach or publicize the findings of the Part 2 evaluation apart from a webinar on May 13 (2024) to allow stakeholders to present their views directly to the Agency.

> **EPA Response:** EPA utilized standard approaches to communicate the release of the asbestos part 2 draft risk evaluation, including a public webinar and 60-day public comment period. EPA is subject to a consent decree with ADAO.

10.4 Organization of the Risk Evaluation

Summary: A commenter (0067) noted that the risk evaluation and associated support documents are complex.

A commenter (0078) stated that the risk evaluations for asbestos under TSCA are lengthy and disjointed.

A commenter (0082) criticized the organization of the risk evaluation and stated that it was incomprehensible and included arcane details that lack a compelling narrative about the dangers of legacy asbestos and the limitations of current risk management efforts that would engage experts and the public in a robust process on how best to eliminate the urgent risks identified.

> **EPA Response:** The EPA acknowledges that the risk evaluations for asbestos have been released in two parts and that the part 2 risk evaluation is a large and complex document. The executive summary is designed to be accessible to the general public, while the remainder of the risk evaluation and the associated supplemental documents provide a high level of detail targeted at technical experts to provide transparency and support for the underlying science.

10.5 Other Comments

Summary: A commenter (0068) expressed concern that the one-time reporting rule for asbestos will not provide accurate information on asbestos containing-articles because countries of origin are not likely to test for asbestos or notify US importers of its presence, specifically with respect to talc products.

A commenter (0070) requested that EPA conduct a systematic review of the data collected under the one time reporting rule under TSCA Section 8(a) to ensure that the data considered in the risk evaluation are representative and high quality. The commenter also notes difficulties with the EPA reporting tool, which delayed submissions until July 5, 2024.

A commenter (0072) commented that the results from the TSCA Section 8(a) reporting rule should be part of the draft risk evaluation. The commenter stated that this rule requires that exposure-related information, including information on the presence, types, and quantities of asbestos, and asbestos-containing articles that have been manufactured, imported, and processed must be provided to EPA. The commenter further notes that due to EPA's reporting platform experiencing technical problems this information would not be fully submitted until July 5, 2024, and therefore this information is not included in the draft risk evaluation. The commenter requests that if information is submitted after the comment period on is closed on the reporting rule that would impact the risk evaluation that the public is given another opportunity to comment on a revised draft risk evaluation since they were not provided an opportunity at the time of posting the original draft risk evaluation.

> **EPA Response:** The EPA has incorporated data submitted in the one-time reporting rule under TSCA Section 8(a) into the final risk evaluation. All submissions were evaluated for quality and relevance to the risk evaluation as described in the Systematic Review Protocol.
>
> More specifically, the final risk evaluation includes an expanded qualitative assessment of conditions of use for importing, processing, and distribution of asbestos, incorporating the TSCA Section 8(a) data. This is appropriate because the draft risk evaluation (and the draft and final scopes) acknowledged uncertainty about these potential COUs in light of the lack of reasonably available information and indicated that EPA expected to receive information about these potential COUs that EPA would consider in the final risk evaluation. Because the draft/final

scope and the draft risk evaluation specifically raised the possibility of the Agency needing to consider these circumstances as conditions of use, stated that EPA did not have information at the time to do an analysis, and previewed that such information was forthcoming and would be considered in the final risk evaluation, including a qualitative assessment of these COUs is not a significant change in position and the new data merely support the prior position outlined in the draft risk evaluation. Furthermore, public comments consistently mention a history of asbestos in imported talc products, indicating that the public was on notice of the possibility that EPA could identify import and related uses as COUs in the final risk evaluation.

Summary: Two commenters (0050 and 0052) requested an extension on the comment period. One commenter (0052) emphasized that an extensive review is required to gather detailed feedback from a broad array of stakeholders, including scientific experts, community leaders, and affected industries. Furthermore, the commenter stated that extending the comment period would ensure fairness and inclusivity, allowing all parties, especially those with limited resources, to thoroughly engage with the draft.

In a separate comment, one of the above commenters (0053) stated that while they continued to request more time to comment on the draft evaluation, they would oppose an extension of the comment period if that resulted in delaying the judicial deadline to finalize the rule.

As one commenter (0053) noted, EPA is subject to a consent decree with ADAO to complete the final part 2 risk evaluation by December 1, 2024; a date which cannot be met if EPA extends the public comment period.

EPA Response: Requests for extensions of the public comment period were denied. Formal responses were uploaded to the regulations.gov docket indicating that the Agency would not be extending the comment period.

TSCA section 6(b)(4)(G) requires risk evaluations to be completed as soon as practicable, and section 6(b)(4)(H) requires EPA to provide no less than 30 days public notice and opportunity to comment on the draft risk evaluation, while 40 CFR 702.43(c) requires 60 days. The 60-day comment period meets these requirements and is consistent with typical length of comment periods EPA provides, while it still allows EPA to meet the aggressive timeline that this risk evaluation is subject to. EPA is subject to a consent decree with ADAO to complete the final part 2 risk evaluation by December 1, 2024. As a result, EPA was not able to grant the request for an extension of the public comment period.

EPA recognizes the importance of having an inclusive and participatory process that fosters transparent, open, and meaningful dialogue with stakeholders as we work to carry out the Agency's mission to protect human health and the environment. EPA is committed to continued meaningful engagement during the comment period and afterward as the Agency works to develop a proposed risk management rule to address the unreasonable risk identified in the final part 2 risk evaluation.

Summary: A commenter (0082) stated that legacy asbestos is a major contributor to the death toll of 40,000 deaths each year, and that the EPA must address all asbestos fiber types, not just chrysotile. The

commenter stated that the pathways and sources of exposure to legacy asbestos are considerably more extensive and varied than the six conditions of use (COUs) examined in Part 1 and that the goal of Part 2 should be to examine the magnitude and duration of exposure to legacy asbestos from various exposure pathways and then to determine the risks of lung cancer, mesothelioma, and lung disease that they pose to the public. As in Part 1, the bottom line of Part 2 will be a determination of whether exposure to legacy asbestos presents an unreasonable risk of injury to human health. The commenter stated that this rulemaking will provide a unique opportunity to strengthen the large but incomplete patchwork of federal and state laws and regulations that were put in place to manage legacy asbestos and stated the importance of this to provide public health benefits of more comprehensive and effective protections from asbestos exposure would be far-reaching and substantial.

> **EPA Response:** EPA appreciates the comment. The final asbestos part 2 risk evaluation included evaluation of the asbestiform varieties of six fiber types – chrysotile (serpentine), crocidolite (riebeckite), amosite (cummingtonite-grunerite), anthophyllite, tremolite, or actinolite. Libby Amphibole Asbestos (and its tremolite, winchite, and richterite constituents) were also considered in the Part 2 asbestos risk evaluation. The Agency also considered asbestos-containing talc conditions of use that fall under TSCA authority.

Summary: A commenter (0082) stated that the draft risk evaluation has serious flaws and limitations and does not fully characterize the health risk from legacy asbestos exposure, but that it leaves no doubt that legacy asbestos poses a significant ongoing threat to public health. Legacy asbestos is present in hundreds of thousands of structures, building sites and disposal facilities. It also confirms that the populations at risk are large and diverse and include workers and their families, teachers and students, firefighters and other emergency responders, occupants of abandoned buildings, residents of homes and apartments, do-it yourself consumers, and people who live or work in the vicinity of construction and demolition sites. The draft legacy asbestos estimated risks are above EPA's unreasonable risk benchmarks for cancer and non-cancer endpoints.

> **EPA Response:** EPA has addressed the specific concerns regarding specific components of the risk evaluation from this commenter in the preceding sections. EPA acknowledges the general support for the unreasonable risk determination.

Summary: A union representing educators (0081) expressed support for using a more realistic interpretation of the condition of use, specifically suggesting that EPA conclude that there is a potential for non-friable asbestos to be disturbed or degraded, releasing asbestos fibers into the air, i.e., that non-friable materials that become damaged or deteriorated should be treated as friable.

> **EPA Response:** EPA uses the term COU in accordance with the TSCA § 3(4) definition of ''the circumstances, as determined by the Administrator, under which a chemical substance is intended, known, or reasonably foreseen to be manufactured, processed, distributed in commerce, used, or disposed of." The condition of use referred to in the assessment is not related to the state of asbestos containing articles.
>
> EPA has clarified in the final risk evaluation that asbestos-containing materials that are modified or disturbed significantly contribute to unreasonable risk. This would include modifying or

disturbing friable asbestos-containing materials or modifying or disturbing non-friable asbestos-containing materials so that they become friable.

Section 11 Out of Scope Comments

11.1 Comments on Asbestos Part 1 RE or the White Paper Letter Peer Review

Summary: A commenter (0072) submitted comments that were previously submitted to the EPA for the White Paper: Quantitative Human Health Approach to be Applied in the Risk Evaluation for Asbestos Part 2 – Supplemental Evaluation including Legacy Uses and Associated Disposals of Asbestos. The same commenter (0072) also submitted comments that were previously submitted to the EPA regarding the March 17, 2023 Notice of Data Availability for Asbestos Part 1: Chrysotile Asbestos; Regulation of Certain Conditions of Use Under Section 6(a) of TSCA.

A commenter (0071, 0075, 0076) submitted comments that were previously submitted to the EPA for the draft risk evaluation for Part 1: Chrysotile Asbestos as supporting documents.

> **EPA Response:** EPA's responses to comments on the White Paper: Quantitative Human Health Approach to be Applied in the Risk Evaluation for Asbestos Part 2 – Supplemental Evaluation including Legacy Uses and Associated Disposals of Asbestos will be included in a separate document on the associated docket (EPA-HQ-OPPT-2023-0309). EPA's responses to comments on the March 17, 2023 Notice of Data Availability for Asbestos Part 1: Chrysotile Asbestos; Regulation of Certain Conditions of Use Under Section 6(a) of TSCA can be found in the document: EPA Response to Public Comments Received on the Draft Scopes of the Risk Evaluations under the Toxic Substances Control Act (TSCA) for: Asbestos Part 2: Supplemental Evaluation Including Legacy Uses and Associated Disposals of Asbestos (EPA-HQ-OPPT-2021-0057-0759). EPA's responses to comments on the Draft Risk Evaluation for Part 1: Chrysotile Asbestos; Regulation of Certain Conditions of Use under the Toxic Substances Control Act can be found in the document *Summary of External Peer Review and Public Comments for Asbestos and Disposition for Asbestos Part 1: Chrysotile Asbestos. Response to Support Risk Evaluation for Asbestos Part I: Chrysotile Asbestos* (EPA-HQ-OPPT-2021-0057-0027).

11.2 Current Regulations

Summary: A commenter (0069) expressed concern that existing federal statues are inadequate to properly address legacy asbestos exposure and employer accountability.

> **EPA Response:** EPA understands that current federal laws do not require the removal of legacy asbestos from industrial or commercial buildings unless those buildings are being renovated, repaired, or demolished in which case the AHERA and NESHAP regulations do apply and workers must remove asbestos containing material, manage those materials, and dispose of those materials according to the regulations.

11.3 Risk Management

Summary: A commenter (0066) expressed interest in EPA's implementation of TSCA in relation to drinking water, specifically how risk evaluations may impact water system operations and investment in infrastructure. The commenter noted EPA did not find sufficient information to evaluate asbestos in water and recommended that this information be highlighted in the executive summary. The comment recommended several databases for water monitoring data in future risk evaluations.

> **EPA Response:** The implications for future water system operations and infrastructure pertains to risk management and not the draft risk evaluation. EPA will pursue risk management after finalization of the risk evaluation to address the unreasonable risk of asbestos to human health.

Summary: A commenter (0074) expressed concern over EPA's ability to enforce an asbestos exposure limit of 0.004 f/cc and described limitations to current regulations, including regulation of private homes. Additionally, the commenter recommended formal regulation of winchite and richterite.

> **EPA Response:** The enforcement of exposure limits and future regulation pertains to risk management and not risk evaluation. EPA will pursue risk management after the finalization of the risk evaluation to address the unreasonable risk of asbestos to human health.

Summary: A commenter (0082, 0083) provided recommendations to ensure that legacy asbestos remains a high priority. These recommendations included contracting with the National Academy of Sciences to provide a full review of the risks of legacy asbestos and its impact on public health and identify risk management strategies that will more effectively prevent asbestos-related death and disease; cooperating with other agencies and departments, convene a stakeholder advisory committee to review existing laws and regulations applicable to legacy asbestos, identify gaps in coverage and implementation, and recommend improvements; Conducting an updated study of the presence of asbestos in public, residential and commercial buildings in the US; and developing educational asbestos prevention materials and conduct extensive community outreach campaigns

> **EPA Response:** While EPA appreciates the recommendations from the commenter, the comment is not germane to the risk evaluation, and nor does EPA have the millions of dollars or multiple years a National Academy of Sciences review typically requires available to spend at this time. EPA will pursue risk management after the finalization of the risk evaluation to address the unreasonable risk of asbestos to human health.

Summary: A commenter (0063) stated that the air sampling required in schools under 1986 EPA Asbestos Hazard Emergency Response Act (AHERA 763.90) regulation should be extended to all asbestos abatement projects (public and commercial). The commenter notes that regulations differ across states and the cost of testing would be a small fraction of the total cost of renovation projects.

> **EPA Response:** EPA appreciates the comment regarding extending the requirements following the completion of a response action under the Asbestos-containing Materials in Schools Rule (40 part CFR 763, subpart E) pursuant to the Asbestos Hazard Emergency Response Act (AHERA). However, the comment pertains to risk management and not risk evaluation. EPA will pursue risk management after the finalization of the risk evaluation to address the unreasonable risk of asbestos to human health.

Summary: A commenter (0065) noted that legacy uses of asbestos and associated disposals are regulated by other federal agencies and suggests coordination across agencies during risk management to impose "the least burdens of duplicative requirements."

> **EPA Response:** The coordination of regulation across federal agencies pertains to risk managment and not the risk evaluation. EPA will pursue risk management after finalization of the risk evaluation to address the unreasonable risk of asbestos to human health.

Summary: A commenter (0069) stated that current federal asbestos law does not require the safe removal of legacy asbestos from commercial or industrial buildings and does not require routine or episodic exposure monitoring data to be submitted to government regulatory agencies. Additionally, the comment notes that these laws do not demand an assessment of the location, current conditions or damage to existing asbestos in commercial or industrial buildings.

> **EPA Response:** EPA will pursue risk management after finalization of the risk evaluation to address the unreasonable risk of asbestos to human health.

Summary: A commenter (0082) cited various report findings about the health effects of asbestos from sources ranging from the International Agency for Research on Cancer (IARC), the U.S. Department of Health & Human Services, and the World Health Organization to emphasize the need to eliminate exposures to asbestos and underscore the public health challenge that asbestos presents. The commenter noted an overwhelming consensus in the scientific community that there is no safe level of exposure to asbestos. The commenter reemphasized a public comment on the draft Part 1 evaluation with a detailed sequence of studies demonstrating the absence of a safe level of asbestos. The commenter (0082) recognized that OSHA standards exist but are limited by considerations of economic and technical feasibility, and emphasized that through TSCA, EPA has authority to fill gaps in worker protection by imposing additional requirements (including a ban on importation and use) where necessary to eliminate unreasonable risks to workers.

> **EPA Response:** Following publication of the final Asbestos Part 2 risk evaluation, EPA will work expeditiously to address the unreasonable risk of asbestos under its conditions of use identified in the risk evaluation. As part of that risk management, EPA will work to identify and propose risk management actions to the extent necessary to address the unreasonable risk of asbestos.

11.4 Other Out of Scope Comments

Summary: A commenter (0079) identified the following legacy asbestos uses at nuclear power facilities: arc chutes for electrical breakers; packing for valve stems and other equipment; piping insulation; and building materials. The commenter estimated that there are 15,000 medium voltage (4KV) breakers with asbestos arc chutes in use. Breakers are essential safety equipment and were designed to last the lifetime of the facility; their replacement would cost billions of dollars and take up to 8 years to implement. Breakers are removed and refurbished at an authorized facility every 10 years for periodic maintenance.

Asbestos packings are used in mechanical equipment such as valves and pumps. Alternative non-asbestos materials are used for both, but packings are only replaced during repairs or periodic overhauls based on time or condition.

The commenter additionally noted that nuclear power plants have asbestos control programs in place, that provide engineering controls and PPE requirements, and requests that EPA consider these controls when evaluating asbestos risk at nuclear facilities. The commenter also noted that asbestos risks need to be weighed against the risk of additional radiation exposure to workers for the removal task and recommends that ACM should be left in place until end of life and replacement needed.

NEI requests that EPA allow the continued distribution in commerce and use of any existing stocks of ACM by nuclear suppliers or nuclear facilities, including the continued shipments of breaker assemblies for maintenance, due to the complex equipment qualification and quality assurance regulations imposed by the National Response Center (NRC).

> **Response:** EPA appreciates the information submitted by the commenter on specific legacy asbestos uses at nuclear power facilities. EPA understands that there are special design, regulatory and radiation safety issues related to asbestos uses at nuclear facilities that should be taken into consideration to develop appropriate risk management measures in the future risk management action for asbestos.