UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Comments of Asbestos Disease Awareness Organization on Proposed Part 1: Chrysotile Asbestos Risk Management Rule for Certain Conditions of Use Under Section 6(a) of the Toxic Substances Control Act (TSCA)

EPA–HQ–OPPT–2021–0057

87 Federal Register 21706

(April 12, 2022)

The Asbestos Disease Awareness Organization ("ADAO") is pleased to comment on the Environmental Protection Agency ("EPA") proposed risk management rule for certain conditions of use ("COUs") of chrysotile asbestos under section 6(a) of the Toxic Substances Control Act ("TSCA").

Who is ADAO

Launched in 2004, ADAO is now the largest independent non-profit organization in the U.S. dedicated to eliminating asbestos-caused diseases. ADAO is far more than an asbestos victims' organization; our cutting-edge research, ongoing product testing, and educational efforts have enabled us to be a leading stakeholder in prevention policy. We have been a strong and outspoken advocate for a comprehensive US ban on asbestos, championing both strong EPA action under TSCA and enactment of the Alan Reinstein Ban Asbestos Now Act ("ARBAN"), which would expeditiously eliminate the importation and use of raw asbestos and asbestos-containing products.

ADAO's Science and Prevention Advisory Boards are comprised of world class researchers, physicians, former government officials and experts in asbestos exposure. Their advice ensures that our educational resources and advocacy materials reflect the best available science and are credible and up to date. Along with other leading scientists, members of our Boards have worked tirelessly for nearly two decades to ban asbestos.

Our work is critical for many sufferers from asbestos-related diseases and family members of loved ones who died from asbestos exposure. Alarmingly, our research from the Institute for Health Metrics and Evaluation reveals that from 1991 to 2021, more than one million Americans died from preventable asbestos-caused diseases.[1] Asbestos-related deaths have not been limited to some regions, but have occurred in all states. These deaths represent only a snapshot in time; the total number of deaths during the 100+ years of asbestos use is much larger. Unfortunately, the death toll from

[1] https://www.asbestosdiseaseawareness.org/newsroom/blogs/adao-asbestos-mortality-report-from-1991-2019/

Asbestos Disease Awareness Organization
1525 Aviation Boulevard, Suite 318 · Redondo Beach · California · 90278 · (310) 251-7477

asbestos exposure still remains high: research shows that asbestos claims over 40,000 American lives each year.

Overview of the Part I Proposal

The Part 1 proposal has the following key components:

- Asbestos could no longer be imported and used by the chlor-alkali industry – the only current U.S. importer of raw chrysotile asbestos – to manufacture chlorine and caustic soda.
- Importation and use of chrysotile asbestos-containing sheet gaskets, brake blocks, aftermarket automotive brakes/linings, other vehicle friction products, and other gaskets would also be prohibited.
- EPA's prohibitions on asbestos diaphragms used in chlor-alkali production and sheet gaskets would take effect two years after the effective date of the final rule.
- The prohibitions for the remaining four COUs would take effect 180 days after the final rule becomes effective.
- As a fall-back option, EPA seeks comment on a five-year phase-out period for asbestos diaphragms used in chlor-alkali production and sheet gaskets, coupled with an Existing Chemical Exposure Limit ("ECEL") that would impose more stringent controls on workplace exposure to asbestos until these uses are phased out.
- No restrictions would be placed on the five remaining asbestos fibers and other COUs of use of chrysotile asbestos.
- EPA has prepared a detailed Economic Analysis of the costs and benefits of the proposed rule.

Summary of ADAO Comments

Lethal Properties of Asbestos

Asbestos is likely the most hazardous substance in commercial use since the industrial revolution and is responsible for millions of deaths worldwide. It causes lung cancer, mesothelioma, other cancers and debilitating non-cancer diseases like asbestosis. Asbestos is universally recognized to have no safe level of exposure and US deaths linked to asbestos total nearly 40,000 per year despite large reductions in current asbestos use.

Since there are no controlled conditions under which asbestos use is safe, public health organizations in the US and around the world have called for the elimination of asbestos from commerce. As a result, asbestos has been banned in nearly 70 countries around the world. However, 33 years after EPA unsuccessfully tried to ban asbestos under TSCA in 1989, most asbestos uses are lawful and asbestos and asbestos-containing products are still imported and used in the U.S.

Need for a Comprehensive Asbestos Ban

The Part I proposal is the biggest step forward in preventing asbestos exposure and risk since EPA's ill-fated 1989 rule banning asbestos was set aside in a 1991 court decision. ADAO applauds EPA's leadership in developing the proposed rule. We strongly support banning all six chrysotile asbestos

COUs determined to present unreasonable risks in the Part 1 risk evaluation and eliminating these uses as soon as possible.

EPA has broad authority under Section 6(a) of TSCA to ban substances where necessary to eliminate unreasonable risks to health. The evidence is overwhelming that the Part 1 chrysotile COUs must be prohibited to protect workers, their families, consumers and at risk communities from harm and that restrictions short of a full ban will be ineffective.

EPA's recent emphasis on a "whole chemical" approach to risk evaluation and management underscores the need for a comprehensive asbestos ban. Asbestos presents unique dangers to human health that cannot be effectively addressed on a use-by-use basis:

- Any level of exposure to asbestos can cause cancer and debilitating non-cancer disease
- The toll of death and disease from asbestos has been massive and remains alarmingly high
- Exposure to asbestos exists at all stages of its life cycle and across multiple pathways of exposure
- The level of risk from asbestos is a function of the cumulative impact of multiple exposure pathways and fiber types, not individual COUs in isolation
- Unreasonable risk can only be prevented by eliminating all sources of exposure

EPA emphasized these factors in deciding to impose a comprehensive ban in its 1989 TSCA rule. As the Agency recognized, risk management measures that focus on individual COUs in isolation from all pathways of exposure across the asbestos life-cycle will fail to address the full magnitude of the risks it presents. When these "whole chemical" risks are taken into account, the only measure authorized by section 6(a) that will provide sufficient protection is a prohibition on manufacturing, processing, and distributing asbestos in commerce under section 6(a)(1). Thus, this ban is "necessary so that [asbestos] no longer presents [an unreasonable] risk."

Elimination of Asbestos from Chlor-alkali Production

EPA should reject requests by industry to exempt chlor-alkali production from the Part 1 ban. The industry now accounts for all importation and use of raw asbestos in the U.S. Producers have recently sourced asbestos from mines in China, Russia and Brazil, where miners often work in unsafe conditions. EPA has concluded that workers at U.S. chlor-alkali plants are exposed to unreasonable risks of mesothelioma and lung cancer. As shown below, this determination substantially understates asbestos risks during all stages of the asbestos life-cycle in the industry.

Only 8 of the 42 chlor-alkali plants in the U.S. continue to use asbestos-diaphragms. The industry has recently shut down substantial diaphragm-based production capacity for economic reasons and, as EPA concludes in its Economic Analysis of the proposed rule, elimination of the remaining plants is likely even in the absence of regulation.[2]

[2] Office of Pollution Prevention and Toxics U.S. Environmental Protection Agency, *Economic Analysis of the TSCA Section 6 Proposed Rule for Asbestos Risk Management, Part 1*, April 2022 (hereafter "Economic Analysis") https://www.asbestosdiseaseawareness.org/wp-content/uploads/2022/04/EPA-ASBESTOS-PART-1-ECONOMIC-ANALYSIS.pdf.

The asbestos diaphragm process is obsolete and inefficient and the more cost-effective membrane cell process now accounts for 83 percent of global production of chlorine and caustic soda. According to EPA's economic analysis of the proposed rule, elimination of all remaining asbestos use in the industry is not only feasible but will have economic and environmental benefits while protecting workers and other exposed populations from asbestos-related harm.

Implementing the Chlor-alkali Asbestos Phase-out in Two Years

EPA's proposal correctly calls for the chlor-alkali industry to stop importing and using asbestos two years after the final rule becomes effective. We support this phase-out deadline and agree with EPA that it can be accomplished without disrupting the U.S. supply of chlorine and caustic soda. While the industry has claimed that it cannot feasibly eliminate asbestos within two years, it has provided no evidence justifying the need for more time. Indeed, its recent voluntary closure of substantial asbestos-diaphragm capacity demonstrates that the remaining plants can be shut down quickly and without hardship to industry or consumers.

Requiring Stringent Exposure Limits If the Chlor-alkali Phase Out Extends Beyond Two Years

As a fallback option, EPA seeks comment on a five-year phaseout deadline for the use of asbestos in chlor-alkali production. We do not favor allowing producers more time to eliminate asbestos. However, we agree that EPA should require compliance with stringent workplace controls if it gives the industry five years to implement a ban. As explained below, we believe the proposed ECEL should in fact be substantially lower than EPA has proposed. The risk determinations in EPA's Part 1 evaluation are likely underprotective because they do not factor in other sources of exposures by impacted workers and consumers, assume the use of respirators contrary to current EPA policy, and do not take into account risks of non-cancer health effects. Thus, significant reductions in worker exposure, well below the proposed ECEL, are necessary to achieve TSCA risk benchmarks for workers if exposure to asbestos continues beyond two years.

EPA should also assure that the ECEL is implemented in accordance with the well-established "hierarchy of controls," under which engineering controls and changes in production methods take precedence over less effective personal protective equipment (PPE). The ECEL should only allow PPE as a last resort if other measures are infeasible.

Limited Scope of the Part 1 Proposal and Need for Comprehensive Legislation Banning Asbestos

While the EPA Part 1 proposal is an historic step forward, it does **not provide full protection against unsafe asbestos exposure**. Under the Biden Administration, EPA has made overdue progress in addressing asbestos using the tools in the 2016 TSCA amendments, but the weak foundation laid by the Trump EPA has limited the scope of Part 1 risk evaluation and risk management. Thus, the proposed rule only addresses chrysotile asbestos. It does not restrict importation and use of the five other recognized amphibole asbestos fibers – crocidolite (riebeckite), amosite (cummingtonite-grunerite), anthophyllite, tremolite and actinolite. These fibers are as harmful as chrysotile. Nor does the Part 1 proposal prohibit current or future uses of chrysotile asbestos beyond the six regulated conditions of use. EPA cannot now rule out the occurrence of these COUs because its information collection process for the Part 1 evaluation was flawed and

incomplete. Because of these gaps and limitations, the proposed rule is not a full asbestos ban and leaves the door open to harmful exposure to asbestos in the future.

To effectively safeguard public health, the five amphibole asbestos fibers (crocidolite (riebeckite), amosite (cummingtonite-grunerite), anthophyllite, tremolite and actinolite) must be prohibited. All COUs of chrysotile asbestos and the other five fibers must also be banned. Because of limitations in Part 1, it will be difficult if not impossible for EPA to achieve these goals in the foreseeable future using existing authority. Congress must therefore enact a permanent, comprehensive and fully protective ban of all asbestos COUs and all six fiber types. Legislation recently introduced in the House and Senate – H.R. 7810 and S. 4244 – would impose such a ban.

Understatement of the Net Benefits of the Proposed Rule

EPA cannot compromise the level of protection required by TSCA based on the proposed rule's costs and benefits. However, TSCA requires it to conduct an analysis of benefits and costs. The Economic Analysis supporting the proposed rule concludes that the rule will have *overall net benefits* because of the energy savings of replacing asbestos-diaphragm chlor-alkali plants with more efficient cell membrane technology. These net benefits would be substantially greater if EPA had not dramatically understated the reduction in asbestos-related death and disease from eliminating the six chrysotile COUs subject to the proposed. EPA has:

- underestimated the size of the worker and consumer populations exposed to the six chrysotile COUs;
- assumed PPE use in the exposure baseline for determining risk reduction under the rule contrary to EPA policy and the limited effectiveness of PPE;
- overlooked the known risks of asbestos to family members of asbestos-exposed workers
- failed to highlight the reduction in cancer risk at other stages of the asbestos life-cycle in the chlor-alkali industry;
- failed to highlight the benefits of preventing cancer and non-cancer health effects of asbestos exposure that are identified but not quantified in the Part 1 evaluation; and
- failed to assign the greatest weight to risk reduction benefits determined with a 3 percent discount rate.

Correcting these shortcomings would add millions of dollars of risk reduction benefits to the EPA's analysis of costs and benefits and substantially increase the proposed rule's net benefits.

EPA also makes detailed calculations of the reductions in air emissions and climate pollution from lower energy consumption due to the transition to cell membrane technology and phase out of asbestos-diaphragm plants. The Economic Analysis monetizes the resulting health benefits, valuing them at tens of millions of dollars, but EPA does not include them in its calculation of net benefits, contrary to EPA and OMB guidelines. Correcting this unjustified approach would substantially add to the rule's net benefits.

Inadequate Justification for Disposal Requirements

Although EPA's final asbestos Part 1 evaluation makes findings of unreasonable risk from asbestos disposal for some COUs, these risk determinations are supported by limited analysis. They also fail to address all aspects of disposal. The proposed rule addresses disposal by incorporating by reference restrictions of asbestos disposal under OSHA and EPA Clean Air Act regulations but does not demonstrate that they provide sufficient health protection to eliminate unreasonable disposal risks in accordance with TSCA section 6(a). EPA must commit to a more comprehensive and rigorous assessment of waste disposal under the TSCA framework. To avoid delaying the Part 1 rule, it may be that this assessment is best undertaken under the Part 2 asbestos evaluation, where EPA will need to examine risks from disposal of legacy asbestos.

I. The Impact of Asbestos Exposure on Public Health Has Been Devastating and It Continues to Kill Americans in Large Numbers

For over a century, asbestos has been known to cause widespread disease and death, yet imports and use continue in the U.S.

Since 1900, the use of asbestos and exposure of Americans to this lethal substance have been massive in scale. According to the U.S. Geological Survey (USGS):[3]

- From 1900 to today, the U.S. has consumed more than 31 million metric tons of asbestos;
- From 1900 to 2002, the U.S. mined 3,308,594 metric tons of asbestos until the last domestic mine closed in 2002;
- From 1900 to 2021, 29,147,399 metric tons of asbestos were imported.

The International Agency for Research on Cancer (IARC)[4], the Occupational Safety and Health Administration (OSHA)[5], the Department of Health and Human Services,[6] the National Institute for Occupational Safety and Health (NIOSH)[7], the World Health Organization (WHO)[8] and a number of other regulatory and public health bodies classified asbestos as a human carcinogen decades ago.

In a monograph on asbestos published in 2012, IARC found the following cancers in humans to be causally related to asbestos exposure: lung cancer, malignant mesothelioma, ovarian cancer, and cancer of the larynx.[9] There is considerable evidence in the scientific literature of causal associations with gastrointestinal cancers and kidney cancer. Non-malignant diseases are also caused by asbestos. These include asbestosis and asbestos-related pleural thickening. All fiber types in commercial use

[3] https://www.usgs.gov/centers/national-minerals-information-center/historical-statistics-mineral-and-material-commodities.

[4] http://monographs.iarc.fr/ENG/Monographs/vol100C/mono100C.pdf.

[5] https://www.osha.gov/laws-regs/federalregister/1994-08-10

[6] https://ntp.niehs.nih.gov/ntp/roc/content/profiles/asbestos.pdf

[7] https://www.cdc.gov/niosh/docs/2011-159/pdfs/2011-159.pdf

[8] https://monographs.iarc.fr/wp-content/uploads/2018/06/mono100C-11.pdf

[9] https://www.who.int/ipcs/assessment/public_health/Elimination_asbestos-related_diseases_EN.pdf

have been linked causally with each of these diseases and are regulated accordingly by OSHA and other government agencies.

Within the last several weeks, the International Labor Organization, a unit of the United Nations, described the global impacts of continuing asbestos use as follows:

> "Asbestos, in all of its forms, including chrysotile, is a proven human carcinogen. More than 125 million workers continue to be exposed to asbestos in their working environments. While the most recent estimates indicate that exposure to asbestos causes 210,000 deaths each year, this figure is likely to be underestimated. Occupational exposure to asbestos is the 2nd deadliest occupational risk factor among chemical exposures, and the 4th deadliest occupational risk factor overall."[10]

The economic cost of inaction has been and remains immense. According to the WHO report "Asbestos Economic Assessment of Bans and Declining Production and Consumption," the "substantial costs associated with the continued use of asbestos potentially outweigh any other economic benefit. The annual global health care costs associated with the health effects of asbestos are estimated to be US $ 2.4–3.9 billion, excluding the additional costs of pain, suffering and welfare losses."

There is overwhelming consensus in the scientific community that there is no safe level of exposure to asbestos. As noted by WHO:

> "Bearing in mind that there is no evidence for a threshold for the carcinogenic effect of asbestos, including chrysotile, and that increased cancer risks have been observed in populations exposed to very low levels, the most efficient way to eliminate asbestos-related diseases is to stop using all types of asbestos."[11]

Recently, WHO "reiterate[d] its policy, which remains unchanged, that the most efficient way to eliminate asbestos-related diseases is to stop the use of all types of asbestos."

Despite the elimination of many asbestos products due to liability concerns, the US death toll from asbestos exposure remains alarmingly high. At the 14th Annual Asbestos Disease Awareness Conference in Washington D.C. in 2018, Dr. Jukka Takala DSc, MSc, BSC, President of the International Commission of Occupational Health (ICOH) and colleagues, reported a shocking increase in previous estimates of asbestos-related deaths, underscoring the escalating and critical need for action by government. According to the study entitled "*Global Asbestos Disaster"*, asbestos-related diseases cause 39,275 deaths in the United States annually—more than double the previous estimates of 15,000 per year.[12]

---

[10] https://www.asbestosdiseaseawareness.org/wp-content/uploads/2022/06/UN-ILO-asbestos-responses-2022.pdf.

[11] https://www.who.int/ipcs/assessment/public_health/chrysotile_asbestos_summary.pdf

[12] S. Furuya, O. Chimed-Ochir, K. Takahashi, A. David, and J. Takala, "Global Asbestos Disaster," *International Journal of Environmental Research and Public Health,* vol. 15, no. 5, p. 15, 2018. See also Eliminating Exposure to Asbestos (apha.org).

Asbestos fibers can become respirable when asbestos-containing materials and products are disturbed or become friable. The primary route of asbestos entry into the body is inhalation; however, fibers can also be ingested.[13] OSHA has three standards to protect workers from the hazards of asbestos in the workplace: General Industry, Shipyards, and Construction. However, OSHA has recognized that these standards do not eliminate significant risks to workers.[14] Thus, the OSHA standards cannot take the place of a ban.

A 2013 study by NIOSH of firefighters in three cities added further evidence of the causal link between asbestos and malignant mesothelioma. The researchers wrote: [t]he population of firefighters in the study had a rate of mesothelioma two times greater than the rate in the U.S. population as a whole" and that "it was likely that the[se] findings were associated with exposure to asbestos, a known cause of mesothelioma."[15]

According to the National Institute of Health, work-related asbestos exposure is responsible for the vast majority of US asbestos-caused deaths. No substance in history has posed a greater threat to the health of workers. The danger extends beyond manufacturing plants— firefighters and school teachers are among the workers at highest risk for asbestos exposure and related diseases. Moreover, asbestos fibers can be carried home on workers' clothing, skin, and hair, thus subjecting their family members to non-occupational asbestos risks that add to risks in the workplace.

II. The Six Part 1 COUs that Present Unreasonable Risks Must be Banned under Section 6(a) of TSCA

A. The Part 1 Proposal Is A Major Step in Preventing Asbestos Exposure After 33 Years of Inaction

Based on growing concern about the dangers of asbestos, preventing exposure under TSCA was a top EPA priority in the 1980s. By the late 1980s, EPA was on a path to eliminate most uses of asbestos. The Agency issued a rule in 1989 under section 6(a) of TSCA prohibiting the manufacture, importation, processing or distribution in commerce of asbestos in almost all products. This rule was based on a determination that asbestos presented an "unreasonable risk of injury" under TSCA section 6.[16] However, despite the comprehensive risk analysis supporting the rule, the Fifth Circuit Court of Appeals overturned the ban in 1991 following an industry challenge. The Court did not question the dangers of asbestos but found that EPA did not comply with TSCA requirements to adopt the "least burdensome" regulatory alternative.[17]

As a result of the court decision, the U.S. is an outlier among developed nations. While nearly 70 countries, including Canada, Japan and the European Union, have banned asbestos, the U.S. has yet

---

[13] https://www.atsdr.cdc.gov/csem/csem.asp?csem=29&po=6

[14] ttps://www.osha.gov/laws-regs/standardinterpretations/1999-07-23

[15] https://www.cdc.gov/niosh/updates/upd-10-17-13.html

[16] 54 Fed. Reg. 29460 (July 12, 1989); https://www.epa.gov/asbestos/asbestos-ban-and-phase-out-federal-register-notices

[17] *Corrosion Proof Fittings* v. EPA, 947 F.2d 1201 (5th Cir. 1991).

to prohibit asbestos importation and most forms of use. As a consequence, asbestos importation and use have been largely unrestricted in the U.S. for the last 33 years.

The 2016 bi-partisan amendments to TSCA were spurred by EPA's inability to ban asbestos under the existing law. As interest in TSCA reform gathered steam, asbestos became a poster child for the law's deficiencies. The 1991 court decision provided a blueprint for how to strengthen the statute, and the 2016 amendments removed the barriers to regulation that caused the Fifth Circuit to overturn the 1989 asbestos ban. It was Congress' goal to "fix[] the . . . problems in the law that caused the asbestos ban to be overturned and that paralyzed EPA and prevented them from regulating some extremely toxic chemicals."[18]

After the new law took effect, there was strong interest in reinstating the 1989 ban and EPA selected asbestos as one of the first 10 substances to undergo risk evaluations under TSCA section 6(b)(2). A draft of the Agency's Part 1 risk evaluation for chrysotile asbestos was made available for public comment and peer review on April 3, 2020. EPA released the final Part 1 evaluation on January 4, 2021. 86 Fed. Reg. 89. The evaluation determined that six chrysotile COUs present an unreasonable risk to human health:

- asbestos diaphragms for chlor-alkali production
- sheet gaskets
- brake blocks
- aftermarket automotive brakes/linings
- other vehicle friction products
- other gaskets

Under section 6(c)(1), these unreasonable risk determinations triggered risk management rulemaking under TSCA section 6(a). EPA initiated this rulemaking with its April 12, 2022 Part 1 proposed rule.

B. The Controlling Factor in Risk Management under TSCA is Whether the Selected Remedy Provides Full Protection Against the Unreasonable Risk

Upon determining that a substance presents an unreasonable risk, EPA is authorized by section 6(a) to impose a wide variety of risk management measures. These include:

- Prohibit or otherwise restrict manufacture, processing, or distribution in commerce;
- Prohibit or otherwise restrict for a particular use or above a set concentration;
- Require minimum warnings and instructions with respect to use, distribution in commerce, or disposal;

[18] 162 Cong. Rec. S3265 (daily ed. May 26, 2016) (statement of Sen. Markey); *see also* 162 Cong. Rec. S3517 (daily ed. June 7, 2016) (explaining that, by "delet[ing] the paralyzing 'least burdensome' requirement in the existing law and instruct[ing] that EPA's rule must ensure that the chemical substance or mixture 'no longer presents' the unreasonable risk," the amended TSCA "clearly rejects the regulatory approach and framework that led to the failed asbestos ban and phase-out rule of 1989 in [*Corrosion Proof Fittings*]").

- Require recordkeeping or testing;
- Prohibit or regulate any manner or method of commercial use;
- Prohibit or regulate any manner or method of disposal; and/or
- Direct manufacturers or processors to give notice of the unreasonable risk to distributors and replace or repurchase products if required.

In choosing among these measures, EPA "must by rule apply one or more requirements to the extent necessary so that the chemical substance or mixture no longer presents [an unreasonable] risk." Since the 2016 law eliminated cost-benefit balancing and no longer required EPA to adopt the "least burdensome alternative," EPA has no discretion to compromise the level of protection it affords based on costs or other economic considerations. The only factor it must apply is whether the chosen remedy provides full protection against the unreasonable risk. While TSCA section 6(c)(2) lists a series of non-risk factors that EPA "shall consider" when selecting risk management options, these factors cannot override EPA's obligation to select requirements that eliminate the unreasonable risk. Only after establishing a floor of protection that assures that the substance will no longer present that risk may EPA consider regulatory costs and benefits in devising its risk management rule.

C. Only A Ban Can Eliminate the Unreasonable Risks Posed by Asbestos

The evidence is overwhelming that the Part 1 chrysotile COUs must be banned to protect workers and consumers from harm and that restrictions less stringent than a full ban will be ineffective. Standing alone, EPA's determinations that the six COUs present unreasonable risks of cancer provide sufficient justification to ban them. In addition, a prohibition of the six COUs is required by the special characteristics of asbestos that present unique dangers to human health:

- Any level of exposure to asbestos can cause cancer and debilitating non-cancer disease
- The toll of death and disease from asbestos has been massive and remains alarmingly high
- Exposure to asbestos exists at all stages of its life cycle and across multiple pathways of exposure
- The level of risk from asbestos is a function of the cumulative impact of multiple exposure pathways and fiber types, not individual COUs in isolation
- Unreasonable risk can only be prevented by eliminating all sources of exposure

EPA must take these factors into account under the "whole chemical" approach it recently announced it will apply to several of the first 10 risk evaluations.[19] This new approach departs from the Trump EPA's focus on use-by-use risk determinations and risk management in favor of examining and eliminating the overall risk across a chemical's life cycle and uses. Thus, EPA must define the substance's risks in light of the interactions between all of its COUs and exposure pathways and how they contribute to total exposure and risk.

Although EPA has not applied the whole chemical approach to asbestos, the considerations

19 87 Fed. Reg. 38747 (June 19, 2022)(Revised HBCD Risk evaluation)

underlying this approach provide a compelling rationale for a comprehensive asbestos ban. Because of the special dangers of asbestos, risk management measures that focus on individual COUs in isolation from all pathways of exposure across the asbestos life-cycle will fail to consider the full magnitude of the risks it presents. When these "whole chemical" risks are taken into account, the only measure authorized by section 6(a) that will provide sufficient protection is a prohibition on manufacturing, processing, and distributing asbestos in commerce under section 6(a)(1). Thus, this ban is "necessary so that [asbestos[no longer presents [an unreasonable] risk."

In opting for comprehensive elimination of asbestos exposure, EPA based its 1989 asbestos ban rule on a similar whole-chemical life-cycle analysis. Thus, EPA "concluded that source reduction actions, like those taken in this rule, rather than controlled use approaches, are necessary to reduce the unreasonable risk posed by asbestos exposure." 54 Fed. Reg. at 29489. EPA explained that:

- "Because of the life cycle or 'cradle- to-grave' nature of the risk posed by asbestos, attempts . . . to regulate the continued commercial use of asbestos still leave many persons unprotected from the hazards of asbestos exposure." 54 Fed. Reg. 29467.
- "EPA has determined that . . . only the staged-ban approach employed in this final rule will adequately control the asbestos exposure risk posed by the product categories affected by this rule." Id. at 29468
- "The ability of asbestos to persist and spread in the environment makes it a hazard to millions of people who may not have any direct occupational or consumer contact with asbestos." Id., at 29477.
- "Controlled-use options were rejected because they would be ineffective in reducing exposure at many points in the life cycle of asbestos products. . . . EPA has found that exposure to even low levels of asbestos poses an unreasonable health hazard." Id. at 29489.
- In other instances. "controlled use approaches create new exposures or move exposures from one stage of the product life-cycle to another." Id.

While asbestos use is less widespread than in 1989, deaths still number nearly 40,000 annually, signifying that the total risk is a function of multiple sources of exposure and reflects the contribution of several life-cycle stages. Unfortunately, however, the Part 1 evaluation examined exposure from each individual COU in isolation, assuming that only workers involved in the COU were at risk and they had no other sources of exposure. The EPA Science Advisory Committee on Chemicals ("SACC") report on the draft evaluation challenged these assumptions, concluding that the Part 1 "estimate for total exposure to asbestos is deficient" and "includes only a limited slice of the exposure" (p. 17). The SACC elaborated that:

- "[C]urrent estimates for human health risk are created for a narrow group of workers and consumer users based on limited exposure to chrysotile asbestos fibers."
- "[E]xposure sources (drinking water, talc, asbestos-containing building materials, vermiculite, etc.) are not included in this evaluation."
- Omission of "past and ongoing exposure from 'legacy' chrysotile and amphiboles . . . does not fit the reality of total exposure to asbestos."
- "Pathways of asbestos exposure include occupational, paraoccupational, consumer, bystander, and family household to both amphibole and serpentine asbestos fibers (of a range of sizes, all potentially toxic)"
- "[E]xposure for the occupational bystander, family and friends who are exposed to asbestos

brought home on the clothes and body of the worker [is] not discussed."
- "[R]elease data for environmental receptors is often lacking as is good characterization of release sources."
- Part 1 "considers only exposure via inhalation. . . [the] dermal route of exposure to fibers . . . cannot be discounted for exposures from the COUs discussed in this DRE."
- "[C]alculations of the risk estimates for cancer . . . require incorporation of aggregate exposures, as these are essential to understand how humans may be affected by multiple sources/pathways."

The SACC report also highlights multiple underestimations of asbestos health effects in Part 1:

- EPA's failure to address "other cancers (e.g., laryngeal, ovarian) is of concern when coupled with the undercounting of mesothelioma risks and the reliance on mortality rather than incidence data."
- EPA's claim that "cancer is the risk driver ignored . . . non-cancer risks such as asbestosis that are also important."
- The "health risk estimates calculated were only for chrysotile asbestos and did not include the likelihood of exposure to amphibole asbestos and exposures to mixed fibers from other uses (industrial talc, drinking water pipes, etc.)"
- EPA should "add quantitative estimates of the added risk of cancer from exposure to asbestos for . . smokers [and] individuals who have chronic lung disease, including chronic obstructive lung disease and pulmonary fibrosis."

In a settlement agreement with ADAO, EPA has committed to take a more holistic approach to asbestos exposure in its Part 2 evaluation, which will address the risks of legacy asbestos, examine all asbestos health effects and routes of exposure, and take into account all asbestos fibers, not just chrysotile.[20] However, these considerations must also inform EPA's risk management approach for the COUs addressed in the Part 1 evaluation. As the SACC recommended, EPA should explicitly recognize that overall asbestos risks are not fully captured by individual risk determinations for the six COUs and that, in deciding how best to eliminate unreasonable risk, EPA must take into account the full magnitude of exposure and risk across the asbestos life-cycle. As EPA concluded in its 1989 rule, this broader analysis demonstrates that controlling but not prohibiting specific COUs does not provide adequate protection against the risks of asbestos and that the elimination of these risks under section 6(a) can only be achieved by a comprehensive ban of these COUs.

III. There is No Justification to Exempt the Chlor-alkali Industry from the Part 1 Ban

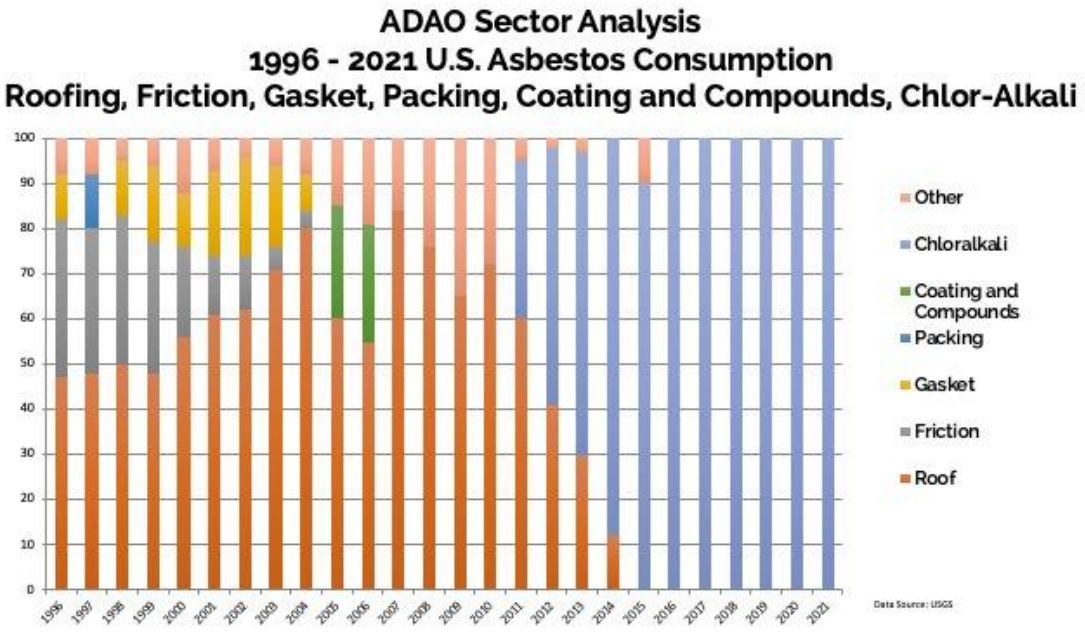
A centerpiece of EPA's Part 1 proposal is a deadline of two years for elimination of the dangerous use of chrysotile asbestos by three companies in the chlor-alkali industry who have failed to adopt non-asbestos technology. In its January meeting with the Biden administration, one of these companies – Olin – requested a "permanent exemption" from any restriction on asbestos imports

[20] https://www.asbestosdiseaseawareness.org/wp-content/uploads/2021/10/2021-ADAO-v.-EPA-ALL-DOCS.pdf. The settlement, entered into on October 12, 2021, resolves ADAO's January 26, 2021 challenge in the Ninth Circuit Court of Appeals to the Agency's Part I Asbestos Risk Evaluation.

and use, arguing that use of asbestos in its plants presents "proven zero public health risk." This claim is indefensible.

A. The Chlor-alkali Industry Is the Sole Remaining Importer and User of Raw Asbestos in the U.S.

USGS data shows that the U.S. manufacturing industries that historically relied on raw asbestos reduced imports starting in the 1990s. In the last 10 years, the chlor-alkali industry emerged as the largest domestic user of raw asbestos and now the industry is the only raw asbestos importer and user. According to USGS, "The chlor-alkali industry, which uses chrysotile to manufacture nonreactive semipermeable diaphragms that prevent chlorine generated at the anode of an electrolytic cell from reacting with sodium hydroxide generated at the cathode, has accounted for 100% of asbestos fiber consumption since at least 2015."[21]



The Economic Analysis (p. 2-1) for EPA's Part 1 chrysotile asbestos rule indicates that bulk asbestos imports by the chlor-alkali industry "tend to range between 100 and 800 metric tons during a given year." According to the United States International Trade Commission, imports by the industry were 750 metric tons in 2018, 172 metric tons in 2019, 305 metric tons in 2020 and 100 metric tons in 2021. Countries that have mined asbestos and sold it to the US industry include Brazil, Russia and China.

Data obtained by ADAO from the United States International Trade Commission (ITC) confirms that the U.S. chlor-alkali industry imported 114 metric tons of raw chrysotile asbestos in the first three months of 2022 alone. This is more asbestos than the 100 metric tons that the industry

[21] https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-asbestos.pdf

imported during the *entire year of 2021*. Over the last 16 months, 140 metric tons of raw asbestos have been imported through the port of Los Angeles. These imports have all been from China.

The recent uptick in imports indicates that the industry is likely stockpiling asbestos for future use.

B. Continued Use of Asbestos in the Chlor-alkali Industry Poses Significant and Unreasonable Risks to Public Health That Can Only be Eliminated by a Ban

Despite the Olin claim that asbestos diaphragms present "proven zero risk," EPA's 2021 Part 1 risk evaluation concludes that workers in chlor-alkali plants face significant and unreasonable risks of lung cancer and mesothelioma. EPA's risk determinations for this COU are in fact significantly understated because they do **not** take into account additional risks to workers and the general population that arise at several other points in the asbestos life-cycle, downstream and upstream from chlor-alkali plants themselves.

For example, as described above, workers in chlor-alkali plants may have additional exposure to asbestos from the pervasive presence of legacy products in buildings and construction sites, other chrysotile COUs, asbestos-contaminated talc and drinking water, asbestos waste disposal and other environmental pathways of exposure. Families of asbestos workers may be at risk because of their exposure to contaminated clothing. In addition, the harm to health faced by workers and their families includes not just mesothelioma and lung cancer but other types of cancer and adverse lung effects like asbestosis that, as SACC stressed, are not addressed fully in the Part 1 risk evaluation.

Because asbestos mining has been phased out in North America, the chlor-alkali industry now sources asbestos from mines in Brazil, China and Russia that lack rigorous worker protections. Extraction and processing of raw asbestos at these mines has put hundreds of unprotected workers at risk of mesothelioma, lung cancer and other serious diseases. Transport of raw asbestos from mines to ports and loading of asbestos onto ships for export results in additional worker exposure in asbestos-producing countries. The harm that workers in these countries suffer is directly attributable to demand for asbestos created by US chlor-alkali producers and should be accounted for in determining the risks from this use of asbestos.

Once imported asbestos arrives in the US, further exposure is likely when the asbestos is unloaded at ports of entry, transferred to trains or trucks, transported to chlor-alkali plants and unloaded for use. During any of these activities, accidents or improper handling could rupture shipping containers and spill asbestos powders in quantities that put workers or bystanders at risk. Since raw asbestos comes into the US at multiple ports of entry, a large worker population is potentially exposed during importation and transportation activities.

EPA's draft Part 1 evaluation acknowledged that damaged shipping containers are known to arrive in the US and "[p]ort and warehouse workers manage and remediate any damaged containers."[22] Damaged containers are also received by plants: "After arriving at the plant, the shipping container with raw asbestos is inspected, and any damaged containers are shipped back to the sender." In addition, "workers' first task after opening the containers is to inspect bags for leaks. If bags are

[22] Draft Evaluation at 61.

broken or loose asbestos is evident, the area is controlled to prevent accidental exposure, the bags are repaired, and the location is barricaded and treated as an area requiring cleanup."[23]

Similarly, the Chlorine Institute's Pamphlet 137 identifies several stages of the asbestos life cycle that give rise to exposure by workers and environmental contamination.[24] These exposure scenarios include losses from torn sacks in shipment, unloading, and storage and waste from vacuuming areas where torn sacks are discovered and patched. Since any level of asbestos exposure is unsafe, workers engaged in these activities are at significant risk.

Removal and replacement of diaphragms and on- and off-site disposal of the resulting asbestos waste also represent significant pathways of exposure. In contrast to chlor-alkali plants, the workforce handling asbestos during these activities is often transient and poorly trained and occupational health protections may be weak or non-existent. Moreover, workers involved in asbestos waste handling, shipping and disposal operations may also be exposed to legacy asbestos in buildings and discontinued products, resulting in additional risks to them and their families. Again, the Part 1 evaluation does not include these pathways of exposure in its unreasonable risk determination for the chlor-alkali COU.

Asbestos waste—much of which is from the chlor-alkali industry—continues to be generated and managed in the U.S. in significant quantities. According to reports submitted for the Toxic Release Inventory (TRI), total friable asbestos releases during 2018-2020 were 59,578,684 pounds, the bulk of which was sent to land disposal facilities at production sites or landfills. Because of limitations in the scope of TRI reporting, the quantity of asbestos waste released to such disposal facilities is probably much larger. Moreover, more than 100 Superfund sites contain asbestos waste, adding to exposure.

Exposure to asbestos wastes generated by the chlor-alkali industry is another significant health risk to workers and the public that is not accounted for in the EPA Part I risk evaluation. Both chlor-alkali plants and disposal facilities managing asbestos wastes are located in disadvantaged communities in Texas and Louisiana with large minority populations and disproportionately high levels of industrial pollution. As EPA indicates in its Economic Analysis (p. 6-32):

> "The community near the Pioneer Americas/Olin Plant has a cancer risk more than three times the Louisiana rural average, and the community near the Occidental Chemical – Taft Plant has a cancer risk more than five times the Louisiana rural average. The Louisiana rural average itself is more than twice the national rural average. These statistics are consistent with concerns raised by stakeholders and observers about a "cancer alley" in Louisiana where majority African American populations are highly exposed to industrial emissions … In addition, the community near the Blue Cube/Olin in Texas has a higher share of Hispanic residents, cancer risks, and respiratory hazard quotients than the Texas overall average and rural average, posing environmental justice concerns. Similarly, the population near the Occidental Chemical – La Porte Plant has elevated cancer risks compared to the national or Texas average, particularly within 3 miles, and has a higher Hispanic population than the

[23] Id.

[24] Pamphlet 137) Guidelines: Asbestos Handling For The Chlor-Alkali Industry: Bookstore.ChlorineInstitute.org.

Asbestos Disease Awareness Organization
1525 Aviation Boulevard, Suite 318 · Redondo Beach · California · 90278 · (310) 251-7477

> Texas average within 1 mile. The areas within 1 mile of the Blue Cube/Olin plant and the Westlake – Plaquemine plant both have respiratory hazard quotients above 1, indicating that adverse non-cancer effects may occur over a lifetime of exposure."

EPA did not consider whether the higher cancer rates in communities near chlor-alkali plants are related to asbestos exposure and, if so, assess how this relationship should impact its selection of regulatory options. However, TSCA requires EPA to evaluate whether potentially exposed or susceptible subpopulations (PESS) face elevated risks compared to the general population and in this event, the Agency must afford them increased protection in TSCA risk management. Should proximity to chlor-alkali plants and asbestos waste disposal facilities contribute to cancer incidence in nearby communities, a ban on asbestos importation and use by chlor-alkali plants would protect these PESS from asbestos risks but continued asbestos use would not.

In sum, EPA correctly determined that importation and use of asbestos by chlor-alkali producers present an unreasonable risk and this determination, coupled with significant additional risks that Part 1 did not consider, amply support banning asbestos importation and use by the industry under section 6 of TSCA.

C. The Exemption of Chlor-Alkali Plants from EPA's 1989 Ban Is Not Relevant to the Part 1 Rule

The industry claims that, because chlor-alkali plants were exempted from EPA's 1989 asbestos ban, the use of asbestos diaphragms to produce chlorine and caustic soda should be deemed safe and allowed to continue. This claim is without merit and puts public health at risk.

Contrary to the industry, the 1989 rule made no determination that use of asbestos-diaphragms to produce chlorine and caustic soda was safe. Moreover, the factors that influenced EPA's treatment of the industry 33 years ago no longer apply. In 1989, chlor-alkali production accounted for a small portion of total US asbestos use, a situation that has now reversed completely. Moreover, membrane cell technology was new and largely unproven at that time. According to the Chlorine Institute, only 2.4% of chlor-alkali production in 1987 came from membrane cells. Thus, EPA in its rule said that "[i]nsufficient information was available to determine whether suitable product substitutes will soon be available for use in existing chlorine production facilities" and "[t]he cost of modifying existing plants to accept new membrane cell technology in response to a ban on asbestos use in this product may be very high." 54 Fed. Reg. 29501 (July 12, 1989).

These conditions have changed dramatically with the widespread acceptance of membrane technology in the US and globally. In the 1989 rule, EPA "specifically recommend[ed] that users of asbestos diaphragms use non-asbestos diaphragm cells in facilities that will accept them and in the design of new facilities." The global chlor-alkali industry has generally followed this advice, except for the three companies that have stuck with outdated asbestos technology.

IV. There is Ample Support for Eliminating Asbestos from the Chlor-alkali Industry Within Two Years of the Rule's Effective Date

TSCA section 6(d) requires risk management rules to "take effect … as soon as practicable" and no later than 5 years after the effective date of a risk management rule. While EPA has set asbestos phase-out deadlines of 180 days for four of the Part 1 COUs, it is proposing a deadline of two years for eliminating asbestos from chlor-alkali and sheet gasket applications.

The chlor-alkali industry has opposed this phase-out deadline as infeasible and harmful to the economy. On April 5, the American Chemistry Council (ACC), representing chemical producers, "expressed industry's disapproval" of EPA's proposal and claimed that it "would ban the manufacture of nearly one-third of chlorine and sodium hydroxide chemicals and have significant adverse effects on the supply of the nation's drinking water." These claims rely on scare tactics and misrepresentations to create a false narrative that has little basis in reality.

In fact, there are only eight chlor-alkali plants using the obsolete and inefficient asbestos diaphragm process. The more cost-effective membrane cell process now accounts for 83 percent of global production of chlorine and caustic soda. According to EPA's Economic Analysis (p. ES-9), elimination of all remaining asbestos use in the industry is not only feasible but will have economic and environmental benefits while protecting workers and other exposed populations from asbestos-related death and disease. The claim that EPA's rule will eliminate one-third of the nation's chlorine production is simply untrue: rather than simply closing plants without replacing lost capacity, EPA's "analysis supports a high probability that these firms will respond to the proposed rule by converting their asbestos diaphragm cells to membrane cells, which do not use asbestos." 87 Fed. Reg. at 21707.

Despite its inflammatory rhetoric, the industry has neither provided evidence justifying the need for more time to comply with EPA's rule nor proposed and supported an alternative phase out deadline. Indeed, its recent voluntary closure of substantial asbestos-diaphragm capacity demonstrates that the remaining plants can be shut down quickly and without hardship to industry or consumers. Accordingly, EPA should retain the two year phase out period in its final rule.

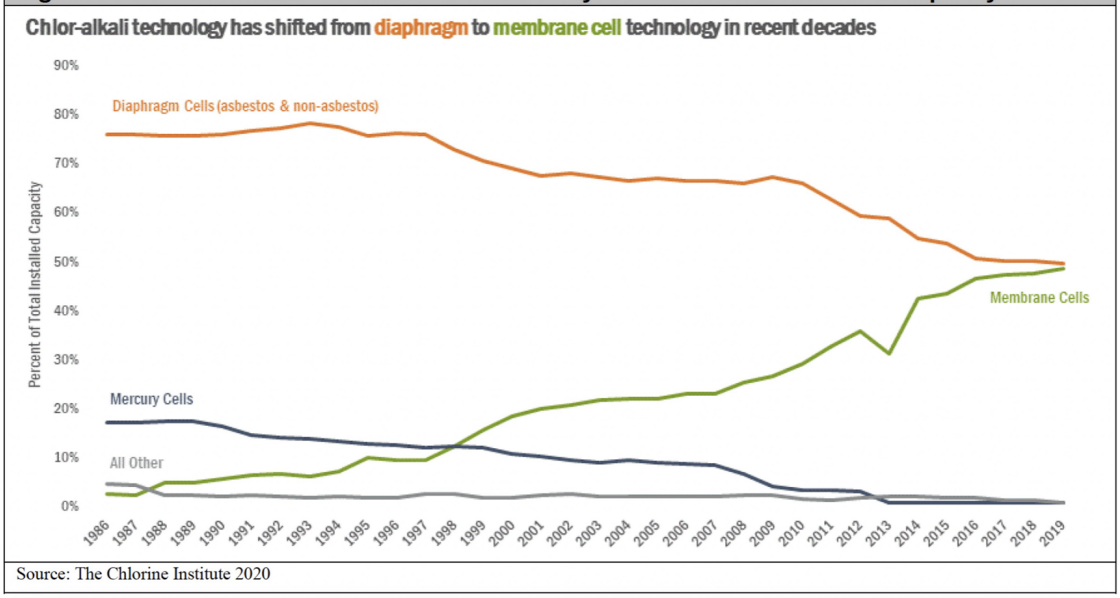
A. The Chlor-alkali Industry Has Moved Away from the Dangerous and Outmoded Asbestos Diaphragm Process to Cost-effective and Proven Non-Asbestos Technology

The three remaining chlor-alkali producers using raw asbestos – Occidental Chemical Corporation, Olin Corporation, and Westlake Chemical Corporation – are outliers in the industry, which has broadly adopted proven non-asbestos technology in the decades since it became available.

A 2020 Chlorine Institute survey of the industry cited in the EPA Economic Analysis shows that there were 21 companies that produce chlorine at 42 plants..[25] As described in the EPA Economic Analysis, U.S. chlorine production capacity using asbestos diaphragms has declined dramatically in the last two decades and membrane plants have replaced this lost capacity:

[25] The Chlorine Institute's 2020 survey reports a somewhat higher number of membrane cell plants than the EPA Economic Analysis, even though EPA states that it is relying on the Institute's data. The reason for the difference is not clear and should be clarified by EPA.

Figure ES-2: U.S. Chlorine Production Methods by Percent of Total Installed Capacity



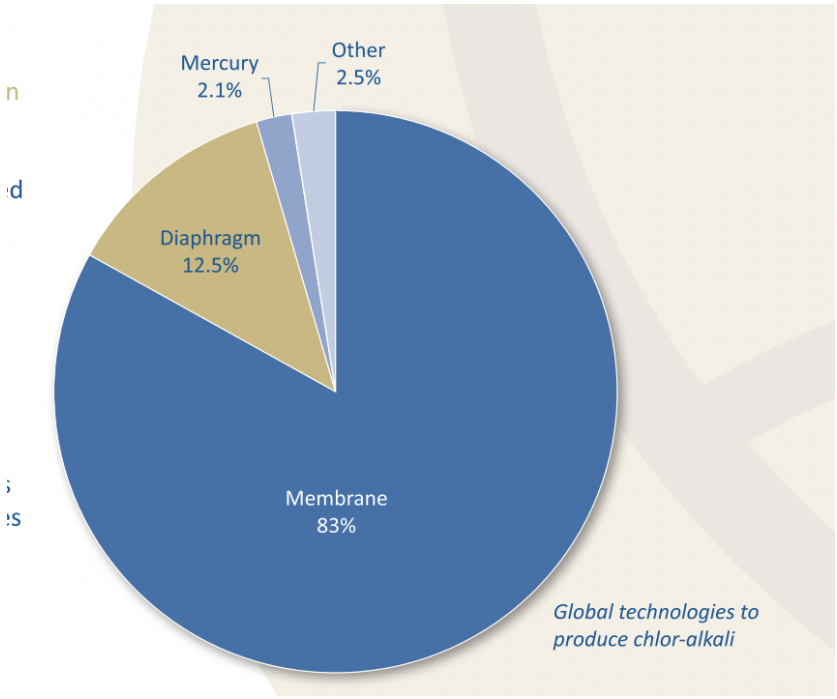
Source: The Chlorine Institute 2020

In the five years since TSCA was amended in 2016, the number of asbestos diaphragm plants has dropped from 17 to eight. Oxychem and Olin recently announced elimination of additional asbestos-diaphragm capacity, further reducing the number of facilities using this technology.

The industry has previously reported that plants using the asbestos diaphragm process account for 33 percent of US production of caustic soda and chlorine while membrane cell and non-asbestos diaphragm technologies contribute the remaining 66 percent. However, the closure of over half of the asbestos-using plants over the last six years makes it likely that these plants now supply a much smaller portion of total production and that chlorine and caustic soda output at membrane-using and asbestos-free diaphragm plants has substantially increased.

Outside the US, the membrane technology accounts for nearly all production of chlorine and caustic soda except in Russia and the Arab world. Only two plants in Western Europe and Canada still use asbestos diaphragms and these plants are mandated to eliminate asbestos by the end of the decade.

The World Chlorine Council recently estimated that 83 percent of global chloride production is based on the membrane process:



According to the EPA Economic Analysis (p. 2-4), the last US asbestos-diaphragm plant was built in 1981 and one plant dates back to the late 1800s. None of the plants has increased production using asbestos diaphragms in approximately 17 years.

B. Recent Shutdowns Of Asbestos Diaphragm Capacity Contradict Industry Warnings of Chlorine Shortages and the Need for Continued Operation of Diaphragm Plants

At the same time that the industry has warned of dire shortages of chlorine if asbestos-diaphragms are banned, it has announced substantial reductions in output from plants using the diaphragm technology. These voluntary shutdowns demonstrate that the industry's expressions of concerns about chlorine shortages under the EPA rule are contradicted by its own substantial downsizing of production capacity and its initiatives to exit the diaphragm technology for economic reasons, apart from regulation under TSCA.

Olin's shutdowns of asbestos diaphragm production capacity are described as follows in the March 31, 2022 Form 10-Q it filed with the Securities and Exchange Commission (SEC):

- On March 15, 2021, we announced that we had made the decision to permanently close approximately 50% of our diaphragm-grade chlor alkali capacity, representing 200,000 tons, at our McIntosh, AL facility. The closure was completed in the first quarter of 2021. On October 21, 2021, we announced that we had made a decision to permanently cease operations of the remaining 50% of our diaphragm-grade chlor alkali capacity, representing an additional 200,000 tons, at our McIntosh, AL facility (collectively, McIntosh Plan). The closure is expected to be completed by the end of the third quarter of 2022.

- On December 11, 2019, we announced that we had made the decision to permanently close a chlor-alkali plant with a capacity of 230,000 tons and our vinylidene chloride (VDC) production facility, both in Freeport, TX (collectively, Freeport 2019 Plan).

- On March 21, 2016, we announced that we had made the decision to close a combined total of 433,000 tons of chlor-alkali capacity across three separate locations (collectively, Chlor Alkali 2016 Plan). Associated with this action, we have permanently closed our Henderson, NV chlor-alkali plant with 153,000 tons of capacity and have reconfigured the site to manufacture bleach and distribute caustic soda and hydrochloric acid. Also, the capacity of our Niagara Falls, NY chlor-alkali plant has been reduced from 300,000 tons to 240,000 tons and the chlor-alkali capacity at our Freeport, TX facility was reduced by 220,000 tons. This 220,000 ton reduction was entirely from diaphragm cell capacity.

This amounts to the announced shutdown of 1,063,000 tons of chlor-alkali production capacity between 2016 and 2021. According to Olin's CEO, "When this shut down is complete, Olin will have rationalized approximately 855,000 ECU tons of high-cost, low-value diaphragm-grade chlor-alkali capacity since early 2021."

On August 21, 2021, OxyChem announced the closure of its Niagara Falls, NY chlor-alkali plant, which uses the asbestos diaphragm process. Recent production data are unavailable but a trade press article cites a 2001 SEC filing as indicating that "the Niagara Falls plant can produce 335,000 mt/year of chlorine and 371,000 mt/year of caustic soda."

If added together, the Olin and Oxchem shutdowns would eliminate 1,769,000 tons of chlor-alkali production capacity. Of this amount, 1,561,000 tons would be at units using the asbestos-diaphragm process. The shutdowns were for economic purposes unrelated to anticipated regulatory action. According to Olin's CEO, the goal was to shed "high-cost, low-value diaphragm-grade chlor-alkali capacity." The Oxychem announcement cited high rail costs as a "major hit on chlorine profitability."[26]

To put the lost capacity in perspective, the Chlorine Institute reports that in 2020, US chlorine production totaled 11,047,683 tons and caustic soda production totaled 11,723,504 tons, for a combined ECU output of 22,771,187 tons.[27] The asbestos diaphragm capacity shutdowns by Olin and Oxychem therefore represented nearly 7 percent of US chlor-alkali production. This would be sufficient to supply the entire needs of the water treatment industry based on EPA-cited data on the percent of total ECU volume dedicated to this sector.

---

[26] It appears that Oxychem is planning additional shutdowns of asbestos diaphragm capacity, announcing a $1.1B modernization of its Deer Park facility which would result in "replacing some or all of its [asbestos diaphragm] production process with a newer technology, known as membrane cell."

[27] Chlorine Institute, Pamphlet 10 North American Chlor- Alkali Industry Plants and Production Data Report Edition 2020 https://bookstore.chlorineinstitute.org/pamphlet-10-north-american-chlor-alkali-industry-plants-and-production-data-report-2014.html.

If one assumes that asbestos diaphragm units accounted for 33 percent of total chlor-alkali production in 2020, as industry has claimed, the Olin and Oxychem shutdowns would reduce the diaphragm share of total production to 26 percent, everything else being equal. If the diaphragm share in 2020 was *lower* than 33 percent because of prior retirements of asbestos-using plants, then the share after the recent Olin and Oxychem retirements would be correspondingly lower and the share membranes and other non-asbestos technologies may now account for 75 percent of total chlor-alkali production. (We believe that the 33 percent asbestos diaphragm share commonly quoted by industry is out-of-date and overstated. When TSCA was amended in 2016, industry reported that the number of plants using asbestos diaphragms was 17 but only eight plants remain.[28] The plant retirements recently announced by Olin and Oxychem appear to be in addition to the 9 plant closures since 2016).

Our analysis shows that, insofar as there are chlorine shortages as industry claims, a major contributing factor is the voluntary shutdown of substantial capacity at asbestos diaphragm plants for economic reasons, not impending regulatory requirements. Industry's voluntary reductions in capacity question the sincerity of its claim that the potential for chlorine shortages requires a delay in phasing out asbestos use in chlor-alkali production. Based on recent industry actions, any shortages in chlorine supply seem largely self-induced.

C. Conversion to Non-Asbestos Technologies Will Result in Cost Savings for the Industry and Net Economic Benefits Overall

The massive shift away from the asbestos diaphragm process in recent decades was not accompanied by shortages of chlorine, supply disruptions, or other adverse economic impacts. It is simply not credible to assert that these consequences will occur if further conversion to non-asbestos technologies is the result of an asbestos ban rather than market forces.

According to the EPA Economic Analysis (p. 3-41), while conversion to the membrane process would incur capital costs, it would also increase energy efficiency and reduce operational costs and could enable production of higher-quality caustic soda that would boost revenues. Thus, EPA's Analysis shows that, under some scenarios, conversion of plants to membrane technology would actually result in annualized cost savings to the industry, meaning that it would produce *net economic benefits and pay for itself over time by improved energy efficiency, higher quality product and longer service life.* For this reason, EPA projects a "high probability" that asbestos diaphragm units would be retired or replaced even in the absence of a ban on these units, continuing the recent trend in the industry. 87 Fed. Reg. 21707.

[28] According to a 2017 EPA report, "[d]uring a meeting with EPA in January 2017, industry representatives stated that in the United States, there are three companies who own a total of 15 chlor alkali plants that continue to manufacture and use chrysotile-containing semipermeable diaphragms onsite." US EPA Office of Chemical Safety and Pollution Prevention, *Preliminary Information on Manufacturing, Processing, Distribution, Use, and Disposal: Asbestos,* February 2017 at 5.

D. In Addition to Eliminating Harmful Asbestos Exposure and Reducing Energy Costs, Non-asbestos Technology Will Have Health and Environmental Benefits

As EPA states in its Part 1 proposal, the ban on asbestos in the chlor-alkali industry "is expected to generate significant benefits from reduced air pollution associated with electricity generation." 87 Fed. Reg. at 21706. This is because "membrane cells are more energy efficient than diaphragm cells [and] reduce . . . [emissions] of carbon dioxide, particulate matter, sulfur dioxide, and nitrogen oxides." EPA estimates that "converting asbestos diaphragm cells to membrane cells could yield tens of millions of dollars per year in environmental and health benefits from reduced emissions." Id. These benefits include reducing global warming.

Another benefit of the membrane process is the elimination of the substantial asbestos wastes generated during use and disposal of asbestos diaphragms and their parts. As noted above, landfills currently receive asbestos waste from chlor-alkali plants and large volumes of waste from the asbestos diaphragm process are also stored on site. The substantial costs and health risks associated with managing these wastes would be avoided if asbestos is no longer used in chlor-alkali production. EPA does not address this reduction in waste generation but, if monetized, these pollution reduction benefits would also substantially increase the net economic savings from an asbestos ban.

E. Industry Makes Alarmist and Misleading Claims that the Part 1 Rule Will Curtail Chlorine and Caustic Soda Use for Drinking Water Treatment

In its April 5, 2020 press release, ACC warned that "EPA's proposal to phase out the use of chrysotile asbestos in chlor-alkali manufacturing could significantly impact public health by reducing the domestic supply of chlorine which is vital to protecting the safety of the nation's drinking water supply." Subsequently, numerous water suppliers – in letters using virtually identical wording – have submitted comments to the EPA docket that, echoing ACC, express anxiety that EPA's rule will create severe shortages of treatment chemicals and put the U.S. drinking water supply at risk. It is likely that these comments were encouraged by the chemical industry.

ACC and others are using scare tactics and misrepresentations to create a false narrative that banning asbestos in chlor-alkali production will dramatically curtail the supply of chlorine and caustic soda for drinking water treatment. This would only occur if the three remaining asbestos users close their diaphragm units and do not replace them with alternate production technology. But EPA considers this a highly implausible scenario because the producers would probably replace lost asbestos diaphragm capacity with non-asbestos diaphragm or cell membrane technology. Economic factors would strongly favor these options given the industry's widespread reliance on non-asbestos technologies, its shaft away from the asbestos diaphragm process for economic reasons, and the heavy investments by the three current users of asbestos in cell membrane plants, presumably because of of their greater efficiency and lower cost of operation.

Even if some reduction in output were to occur during the transition to non-asbestos technology, it would not eliminate access to adequate supplies of water treatment chemicals. According to the EPA Economic Analysis, drinking water treatment is a minor use of chlorine and caustic soda, accounting

for seven percent of total chlorine and five percent of total caustic production in 2013.[29] As shown below, much larger quantities of chlor-alkali output are used in the manufacture of ethylene dichloride, polyvinyl chloride, organic chemicals, inorganic chemicals, isocyanates, chlorinated intermediates, propylene oxide, pulp and paper, alumina, organic soaps and detergents and textiles:

Figure 2: Chlorine and Caustic Soda End Uses

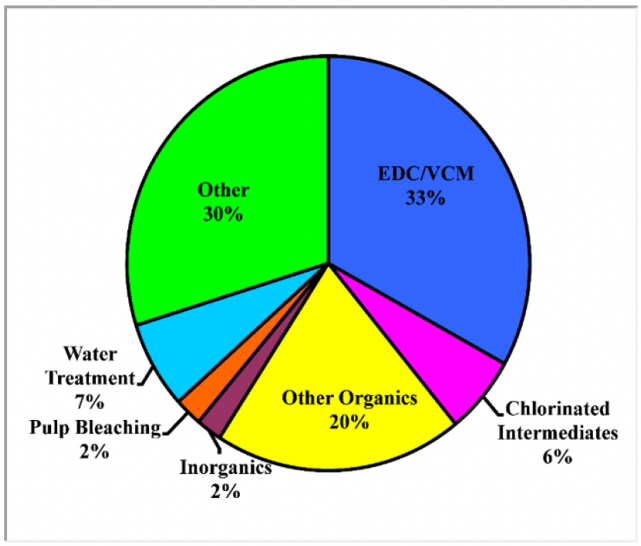


Fig. 1. End uses for chlorine (2013).

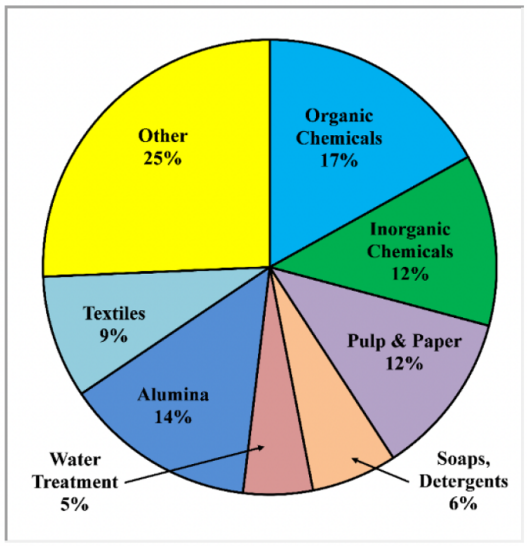


Fig. 2 End uses for caustic soda (2013).

Source: Reproduced from Bommaraju and O'Brien (2015)
EDC/VCM = ethylene dichloride/vinyl chloride monomer

In the unlikely event of shortages, producers could preferentially reallocate chlorine and caustic soda from these high volume uses to drinking water treatment systems to prevent any loss of health protections. EPA could, if necessary, use its authority under the Safe Drinking Water Act to compel the industry to supply the water treatment sector, as it has done previously. This will assure that the sector receives the relatively small amounts of chlorine and caustic soda needed to protect drinking water.

F. PFAS Concerns Do Not Justify Continued Use of Asbestos in Chlor-alkali Production

One chlor-alkali producer has threatened that it will not replace asbestos diaphragm plants with membrane technology because polymers used to manufacture membranes are derived from per- and polyfluoroalkyl substances (PFAS). However, according to EPA's Economic Analysis (p. ES-5), all three cell technologies – asbestos diaphragms, non-asbestos diaphragms and membrane cells – are

[29] Moreover, asbestos-diaphragm plants likely contribute a small percentage of the chlorine and caustic soda used in drinking water treatment. A recent article cites an industry consultant for the estimate that these plants probably account for 10% of the chlor-alkali production sold to the water sector. https://insideepa.com/tsca-news/groups-float-early-critiques-asbestos-proposal-seek-more-time

made from PFAS-based polymers. The three producers that operate plants using asbestos diaphragms also own plants using cell membranes and non-asbestos diaphragms. Thus, they now rely on PFAS chemistry and will use more PFAS as existing plants are refurbished and maintained.

Accordingly, it is not obvious how conversion of the eight remaining asbestos-using plants to alternate technologies will increase PFAS production and exposure. Both membranes and diaphragms have finite life-spans and must be periodically replaced, requiring additional production and use of PFAS-based polymers. EPA'S Economic Analysis (p. ES-5) notes that, "[a]though they contain a higher concentration of PFAS compounds, non-asbestos diaphragms and membranes have a lifespan of 3 to 5 or more years, compared to 200 to 500 days for asbestos diaphragms." The higher replacement frequency of asbestos diaphragms could create *more* demand for PFAS-based polymers and greater PFAS production than if these diaphragms were replaced by membrane cell technologies although EPA underscores the need for additional information to resolve this issue.

According to the Department of Energy (DOE), non-asbestos technologies have environmental and economic benefits that the asbestos diaphragm process lacks and for this reason "[m]embrane cells are the most environmentally benign of all the cell technologies." The benefits of non-asbestos technologies include lower energy consumption, reduced air pollution, absence of hazardous waste and significantly lower wastewater generation. In its Environmental Guidelines for the Chlor-alkali Industry, the World Bank recommends that investors "give preference to the membrane process" based on its "economic and environmental advantages," the absence of hazardous waste and significantly lower wastewater generation. These benefits must be weighed against PFAS concerns.

Most importantly, elimination of asbestos – a lethal carcinogen – significantly lowers human health risks. Thus, EPA states in its proposed Part 1 rule that "the benefits of removing chrysotile asbestos, a known human carcinogen that causes an aggressive and deadly cancer (mesothelioma), from continued use in the United States, are significant enough to outweigh the potential additional exposure to PFAS that might result from this action." 87 Fed. Reg. at 21730.

In sum, concerns about the negative consequences of eliminating asbestos use in the chlor-alkali product are inflated and undocumented. The likelihood is that the transition away from asbestos can be accomplished smoothly, without the acute shortages of chlorine that the industry has predicted. The industry has not explained why more time is needed for this transition and has not proposed and justified an alternate phaseout period. Thus, we recommend that EPA finalize the two-year deadline for removing asbestos from chlor-alkali in its proposed rule.

V. If EPA Adopts a Longer Phase Out Period for the Chlor-alkali Industry, It should Require Compliance with Stringent Limits on Worker Exposure Until the Phase Out is Completed

The primary regulatory alternative identified in the proposed rule is a five-year phaseout deadline for the use of asbestos in chlor-alkali production, coupled with compliance with an existing chemicals exposure limit ("ECEL") until the phase out is complete. 87 Fed. Reg. at 21722. We do not favor this alternative for the reasons described above. Allowing chlor-alkali producers more time to eliminate asbestos would delay protection of public health. In addition, no need has been shown for a more

protracted phaseout period. Thus, the two-year deadline proposed by EPA would eliminate asbestos from chlor-alkali production "as soon as practicable," as required by section 6(d) of TSCA. [30]

However, should EPA give the chlor-alkali industry five years to implement a ban, we agree it is imperative to provide significantly more stringent protection to workers until they are no longer exposed to asbestos. According to the preamble, facilities using asbestos diaphragms would need to meet an 8-hour existing chemical exposure limit (ECEL), beginning 180 days after the effective date of the final rule.[31] EPA has calculated the ECEL to be 0.005 fibers (f)/cubic centimeter (cc) for inhalation exposure to chrysotile asbestos as an 8-hour time-weighted average. 87 Fed. Reg. at 21723.

A. TSCA Requires Reductions in Exposure Well Below the OSHA PEL

EPA's Part 1 risk evaluation determines that current worker exposure levels in chlor-alkali plants exceed EPA's TSCA threshold for unreasonable cancer risk. According to the Agency, the reduction in exposure from the proposed ECEL would lower lung cancer and mesothelioma risk to workers and occupational non-users below the 1x10-4 (1E–4) benchmark that EPA uses to make determinations of unreasonable cancer risk under TSCA. Id.

While some might argue that the ECEL is unnecessary in light of the OSHA Permissible Exposure Limit (PEL) for asbestos of 0.1 f/cc, OSHA standards are by law limited by considerations of economic and technical feasibility.[32] Thus, in adopting its asbestos standard, OSHA conceded that it would not eliminate significant cancer risks to workers. Rather, the Agency estimated 7 workers per 1,000 would develop lung cancer even if every employer fully complied with asbestos exposure limits.[33] TSCA, by contrast, requires determinations of unreasonable risk based strictly on health protection; cost and other non-risk factors cannot be considered. The significant cancer risk that remains at the OSHA asbestos PEL is over an order of magnitude greater than EPA's unreasonable risk threshold under TSCA. Deferring to the OSHA PEL would therefore fail to meet EPA's obligation under section 6(a) of TSCA to reduce asbestos exposure "to the extent necessary" to eliminate unreasonable risk.[34]

---

[30] Section 6(g)(1) of TSCA authorizes EPA to grant time-limited use exemptions from requirements in section 6(a) rules where: "(A) the specific condition of use is a critical or essential use for which no technically and economically feasible safer alternative is available, taking into consideration hazard and exposure; (B) compliance with the requirement, as applied with respect to the specific condition of use, would significantly disrupt the national economy, national security, or critical infrastructure; or (C) the specific condition of use of the chemical substance or mixture, as compared to reasonably available alternatives, provides a substantial benefit to health, the environment, or public safety." It is doubtful that chlor-alkali plants would meet these criteria.

[31] In addition to the chlor-alkali industry, the five year phase-out period and accompanying ECEL would apply to processing and industrial use of chrysotile asbestos-containing sheet gaskets in chemical products.

[32] *American Textile Mfgs. Institute, Inc. v. Donovan (ATM)*, 452 U.S. 490, 508-11 (1981).

[33] Occupational Safety and Health Administration. Asbestos, tremolite, anthophyllite, and actinolite. Available at: https://www.osha.gov. Accessed December 30, 2019.

[34] While EPA may recommend that another federal agency address some or all of a chemical's risks pursuant to TSCA section 9(a), in order to do so, EPA must first "determine[] . . . that such risk may be prevented or reduced to a sufficient extent by action taken under a federal law not administered by the Administrator. As EPA properly found in its proposed rule, a referral of asbestos to OSHA would not be warranted because OSHA would ack authority to set a sufficiently

B. The Proposed ECEL is not Sufficiently Protective

In fact, we believe that the proposed EPA ECEL is unprotective of chlor-alkali workers and must be further reduced to assure adequate protection against asbestos worker risks. As described above, workers in chlor-alkali plants will be exposed to asbestos not just in their immediate workplace but through other pathways, such as the presence of legacy products in buildings and construction sites, other chrysotile COUs, asbestos-contaminated talc and drinking water, and asbestos waste disposal. These workers may also suffer harms to their health in addition to lung cancer and mesothelioma. However, as SACC noted, EPA's risk determinations in the Part 1 evaluation do not factor in other types of cancer and adverse lung effects like asbestosis.[35] Some workers may also be smokers or have preexisting lung conditions which increase their susceptibility to asbestos.[36] In setting a level of protection for workers, EPA must provide an added margin of safety to account for asbestos exposures from non-workplace sources, risks from additional health effects and greater susceptibility by some subgroups in order to assure that its ECEL in fact achieves EPA's TSCA target benchmark risk.

In addition, in determining current levels of exposure and risk, EPA's final Part 1 evaluation assumed use of respiratory protection during some chlor-alkali plant operations.[37] Consistent with the overall approach of the Trump EPA, the evaluation explains (at p. 32) that:

> "EPA generally assumes compliance with OSHA requirements for protection of workers, including the available information indicating that some employers, particularly in the industrial setting, are providing appropriate engineering, or administrative controls, or PPE to their employees consistent with OSHA requirements. While EPA does not have reasonably available information to either support or contradict this assumption for each condition of use, EPA does not believe that the Agency must presume, in the absence of such information, a lack of compliance with existing regulatory programs and practices. Rather, *EPA assumes there is compliance with worker protection standards unless case-specific facts indicate otherwise, and therefore existing OSHA regulations for worker protection and hazard communication will result in use of appropriate PPE in a manner that achieves the stated APF or PF.* . . EPA believes this is a reasonable and appropriate approach that accounts for reasonably available information and

---

stringent PEL under the OSH to prevent or sufficiently reduce the worker risks identified in EPA's risk evaluation. 87 Fed. Reg. at 21732..

[35] As EPA notes in its final risk evaluation at p. 237: "if the noncancer effects (e.g., asbestosis and pleural thickening) of chrysotile asbestos are similar to to Libby amphibole asbestos, the non-cancer effects of chrysotile asbestos are likely to contribute additional risk to the overall health risk of chrysotile asbestos beyond the risk of cancer. Thus, the overall health risks of chrysotile asbestos are underestimated based on cancer risk alone."

[36] The final risk evaluation states (p. 29) that "several subpopulations (e.g., smokers, genetically predisposed individuals, workers who change their own asbestos-containing brakes) may be more susceptible than others to health effects resulting from exposure to asbestos."

[37] In its risk determinations for chlor-alkali workers, it appears that EPA assumed respirator use for some tasks but not others. According to the final evaluation (p, 236): "workers wear respiratory PPE during three tasks (Asbestos Unloading/Transport, Glovebox Weighing and Asbestos Handling, and Hydroblasting), but do not wear respiratory PPE during five of the tasks (Asbestos Slurry, Depositing, Cell Assembly, Cell Disassembly, and Filter Press). Although the use of respiratory PPE during three of the worker tasks reduces asbestos exposure and overall risk to workers, respiratory PPE is not worn throughout an entire 8-hour shift."

professional judgment related to worker protection practices, and addresses uncertainties regarding availability and use of PPE (emphasis added)."

However, this is no longer Agency policy. The Biden EPA has announced revised risk determinations for several of the initial 10 chemicals based on a "a baseline scenario that does not assume compliance with OSHA standards, including any applicable exposure limits or requirements for use of respiratory protection or other personal protective equipment (PPE)." 86 Fed. Reg. 74082, 74086. (December 29, 2021) (Cyclic Aliphatic Bromide Cluster (HBCD)). If applied to asbestos, this new policy would require EPA to revise its determinations of baseline cancer risk to reflect exposure levels without PPE. This would increase risk estimates and require a corresponding reduction in the ECEL to achieve the risk benchmark of 1x10-4.

Finally, EPA's 1x10-4 benchmark for workers is less protective than the 1x10-6 benchmark it uses for consumers under TSCA, yet workers are specifically identified as a PESS in section 3(12) of TSCA. EPA has not explained its rationale for accepting a higher level of risk for workers than other segments of the population. Insofar as EPA is relying on OSHA and NIOSH policies for worker protection, they are based on a different legal framework and are not relevant to defining unreasonable cancer risk under laws administered by EPA.[38] We urge EPA to apply to workers the same benchmarks for determining unreasonable cancer risks that it uses for other populations. For asbestos, this would require an ECEL that protects against cancer risks exceeding 1x10-6, two orders of magnitude below the ECEL in EPA's proposed rule.

C. In Applying the ECEL, EPA Must Assure that Facilities Adhere to the Hierarchy of Controls Under Which PPE Are a Control Measure of Last Resort

We applaud EPA's reliance on the OSHA-NIOSH Hierarchy of Controls in designing its ECEL "with the goal of identifying risk management methods that are permanent, feasible, and effective." 87 Fed. Reg. at 21718. As EPA explains, PPE is the option of last resort under the Hierarchy. Regulated entities must give priority to "elimination, substitution, engineering controls and administrative controls" and "require the regulated entity to use such controls to reduce chrysotile asbestos concentrations in the workplace to the lowest levels achievable and supplement these controls using respiratory protection." Id. at 21725. During implementation of the final rule, EPA must assure that regulated entities adhere to this framework and document that they have implemented all available controls to the extent feasible before allowing the use of respirators.

VI. EPA's Part 1 Proposed Risk Management Rule Does Not Address All Asbestos Fibers and Uses and is not a Full Asbestos Ban

In December 2016, shortly after the passage of amended TSCA, EPA selected ten substances for initial risk evaluations and risk management rulemakings under the new law. Asbestos was among these substances in recognition of its lethal properties and the importance of restarting risk reduction efforts after three decades of inaction. Despite the high hopes of ADAO and other stakeholders, the

[38] Under the Clean Air Act, CERCLA and the CWA, EPA has generally used a risk range of 1x10-4 to 1x10-6 to guide decision-making, with a public health goal of 1x10-6.

Trump Administration's initial implementation of the new TSCA authorities was disappointing. As a result, the Biden EPA inherited an incomplete and weak Part 1 asbestos risk evaluation that had been heavily criticized.

We applaud the current EPA leadership for making asbestos a top priority and expeditiously launching a Part 1 risk management rulemaking to implement the Part 1 evaluation. Unfortunately, the scope of EPA's risk management rulemaking is constrained by the scope of the Trump Administration's risk determinations. Because of the evaluation's limitations and gaps, EPA's Part 1 proposal rule falls short of a full asbestos ban.

A. The Part 1 Proposal Excludes Five of the Six Recognized Asbestos Fiber Types

The Trump EPA made an unwise decision to only address chrysotile asbestos in its Part 1 risk evaluation. Its failure to include the other five fibers was strongly criticized by EPA's SACC as well as by ADAO and many scientists, but the Agency chose to finalize a chrysotile-only evaluation. The Biden EPA was forced to accept this decision or else delay asbestos risk management for several years. As a result, EPA's proposed Part 1 rule was necessarily limited to chrysotile asbestos and omitted the five other asbestos fiber types: crocidolite, amosite, anthophyllite, tremolite, and actinolite.

Leading health authorities have consistently recognized that these fibers, as well as chrysotile, can cause "cancer of the lung, larynx, and ovaries, and also mesothelioma (a cancer of the pleural and peritoneal linings). Asbestos exposure is also responsible for other diseases such as asbestosis (fibrosis of the lungs), and plaques, thickening and effusion in the pleura."[39]

EPA recently initiated a Part 2 risk evaluation and risk management rulemaking for asbestos and committed to include all six asbestos fibers plus Libby amphibole asbestos. However, the main focus of Part 2 will be the risks of "legacy asbestos" – i.e. discontinued building materials and other asbestos-containing products that remain in place. Although these materials and products contain all six of the recognized asbestos fibers, legacy asbestos cannot be readily removed from buildings and articles in which it is embedded. While it is possible that the Part 2 evaluation will identify ongoing COUs for the five excluded fibers, risk management for these COUs would be far in the future. At that point, moreover, TSCA would preclude the Agency from imposing a comprehensive ban on all present and future uses of these fibers. Without legislation imposing a blanket prohibition on their importation and use, there will be no effective protection against future exposure to the five fibers and the public will remain at risk of harm.

B. Part 1 Fails to Address All Chrysotile Conditions of Use

The Part 1 risk evaluation only addressed six chrysotile asbestos COUs: asbestos diaphragms, sheet gaskets, brake blocks, aftermarket automotive brakes/linings, other vehicle friction products, and other gaskets. Consistent with the evaluation, the proposed Part 1 rule only bans these COUs. However, ADAO and its experts have consistently emphasized that the six COUs addressed in Part 1 do not comprise the full universe of currently imported chrysotile-containing products. The EPA SAAC expressed the same concerns in its review of the draft risk evaluation. For example, EPA reports and other information provide evidence of current importation of knitted fabrics (woven

[39] https://www.who.int/news-room/fact-sheets/detail/asbestos-elimination-of-asbestos-related-diseases

products), asbestos cement products, compressed asbestos fiber jointing paper, millboard and felt, building materials and yarn and thread.[40] The proposed Part 1 rule places no restrictions on these products.

Concerned about these omissions, ADAO and its partner organization petitioned EPA in 2018 to use its TSCA authority to require mandatory reporting on asbestos use and exposure. After the petition was denied,[41] ADAO filed suit in 2019. Federal District Court Judge Edward Chen ruled in ADAO's favor in December 2020 and directed EPA to require asbestos reporting by industry under section 8(a) of TSCA.[42] In its opinion, the Court found that EPA has "little information. . . about the quantities of asbestos-containing products in the U.S. chain of commerce and the overall consumer and occupational exposure for downstream uses of asbestos." Judge Chen emphasized that the Agency's failure to use its TSCA reporting authority to obtain this information "runs contrary to EPA's obligation to collect reasonably available information to inform and facilitate its regulatory obligations under TSCA."

In response to the court decision, EPA has belatedly proposed a TSCA reporting rule to obtain all available information on asbestos use and exposure.[43] However, it is too late for the Part I rulemaking to address additional COUs identified under the reporting rule. While these COUs may be addressed in the Part 2 evaluation and in Part 2 risk management, any restrictions will be COU-specific. EPA will be unable under TSCA to ban all chrysotile-containing asbestos products now entering the U.S. and or imported in the future.

Asbestos ban legislation now pending in Congress would close these gaps in risk management. S. 4244 and H.R. 7810 would apply to the six recognized asbestos fiber types and their uses without exceptions or limitations. This would permanently close the door to **all** importation and use of raw asbestos and asbestos-containing products – not just for chrysotile but for all six asbestos fibers and not just for the six COUs addressed in the Part 1 proposal but for all current and future conditions of use. In the absence of legislation, Americans will have no assurance that ongoing exposure to commercial asbestos has been fully eliminated.

VII. A Correct Analysis of Costs and Benefits Would Show that the Benefits of the Proposed Rule Greatly Exceed its Costs

In the 2016 TSCA amendments, Congress revised Section 6 so that EPA's selection of regulatory requirements is no longer driven by a determination of benefits and costs or a requirement to adopt the least burdensome alternative. Instead, amended section 6(a) requires EPA to impose restrictions "to the extent necessary so that the chemical substance or mixture no longer presents [an unreasonable] risk." EPA's Part 1 proposal meets this obligation: as shown above, a ban on the six chrysotile COUs is required not only by the risk determinations in the Part 1 evaluation but by the

[40] https://www.asbestosdiseaseawareness.org/wp-content/uploads/2022/06/2017-EPA-Use-and-Market-Profile-for-Asbestos.pdf,

[41] 84 Fed. Reg. 3396 (February 12, 2019).

[42] *Asbestos Disease Awareness Org. v. Wheeler*, 508 F. Supp. 3d 707 (N.D. Cal. 2020).

[43] 87 Fed. Reg. 27060 (May 6, 2022)

serious health threats presented throughout the asbestos life-cycle in the chlor-alkali industry and the other five COUs.

Nonetheless, under section 6(c)(2)(A) of TSCA, EPA must account for the proposal's benefits and costs. EPA meets this obligation in the Economic Analysis of its proposal. The Analysis shows that, because of greater energy efficiency and lower costs of operation, replacing asbestos diaphragm plants with cell membrane technology will result in *total annualized cost savings* of approximately $35 million and $0.03 million using a 3 and 7 percent discount rate, respectively, assuming increases in caustic soda revenues from higher product quality.[44] Thus, EPA's proposal will have *overall net benefits* even without considering its reductions in asbestos-related deaths and disease and in emissions of harmful pollutants.

Unfortunately, EPA's analysis drastically understates the benefits of reduced health risks under the rule and fails to include the health benefits of reduced emissions. As shown below, a proper analysis would assign much higher values to these benefits, resulting in net benefits that are far larger than the EPA estimates.

A. EPA Has Significantly Understated the Reductions in Health Risks Under the Proposed Rule

EPA's estimates reduced cancer risks from the proposal as follows:

Table ES-4: Total Annualized Benefits from Reduced Cancer Risks (2020$)				
Regulatory Option	3% Discount Rate		7% Discount Rate	
	Low Benefits Estimate	High Benefits Estimate	Low Benefits Estimate	High Benefits Estimate
Proposed Option	$3,058	$3,062	$1,167	$1,169
Alternative Option	$2,862	$2,867	$1,090	$1,092

These remarkably low estimates result from several highly conservative and unwarranted assumptions:

- **EPA has underestimated the size of the worker and consumer populations exposed to the six chrysotile COUs**

The 2020 draft risk evaluation estimated that close to a million workers are exposed to asbestos from the six current COUs.[45] It also estimated that 31,857,106 consumer do-it-yourselfers (DIYs) may have exposure to asbestos when replacing brake pads in their own or others' vehicles.[46] However, EPA sharply reduced these estimates in the final risk evaluation and reduced them again in its

[44] Economic Analysis at ES-8 and 9. Assuming no revenue gains from caustic soda, total annualized costs are estimated to be $49 million and $87 million using a 3 and 7 percent discount rate, respectively. These are small costs for an industry that generates several billions of dollars of revenue annually,

[45] Draft Risk Evaluation at 205, Table 4-54. This includes 167,000 oil industry workers and Occupational Non-users (ONUs) who may be exposed to asbestos at up to 21,670 sites (pp. 84-85) and 749,900 workers in automotive repair and maintenance shops who may be exposed to asbestos brake linings, clutches and gaskets (p.92).

[46] Id. at 204-205.

Asbestos Disease Awareness Organization
1525 Aviation Boulevard, Suite 318 · Redondo Beach · California · 90278 · (310) 251-7477

Economic Analysis. Thus, in analyzing the rule's health benefits, the Analysis assumes that there are only 144 workers, 276 occupational non-users (ONUs), and 400 consumers exposed annually to chrysotile asbestos from the COUs subject to the proposal.

EPA opted for a dramatically smaller exposed population after industry questioned the earlier estimates and the Agency could not find additional documentation to support them. For example, the Agency reduced the number of DIY consumers using asbestos brake pads to 15,929 in the final risk evaluation (at p. 225) and then to 400 in the Economic Analysis because importing companies asserted that their brakes do not contain asbestos and were listed as asbestos-containing by mistake in U.S. customs documents. But the Agency did not require importers to verify these assertions or conduct its own review of Customs records. Similarly, without explanation, EPA reduced the number of ONUs in the chlor-alkali industry to 100, despite having earlier found that "approximately 2,900 to 3,000 other employees who work at the same or adjoining plant" could be exposed to asbestos.[47] EPA also decreased the expected number of ONUs exposed to asbestos through oilfield break blocks from 66,108 to just 1 person because "it is unclear how widespread the continued use of asbestos brake blocks is in oilfield equipment."[48] For the remaining COUs, EPA made no estimate at all of the exposed population because of lack of data.

EPA's shifting estimates of the size of the exposed population and lack of hard data were a concern throughout the development of the Part 1 asbestos evaluation. EPA admitted it lacked meaningful information on the number of exposed workers in its 2018 problem formulation[49] and ADAO highlighted this information gap in its September 25, 2018 petition for mandatory reporting on asbestos under TSCA. After the April 2020 draft risk evaluation again acknowledged the Agency's lack of information,[50] the SACC's August 28, 2020 report questioned "why the number of potentially exposed workers was uncertain" and urged that EPA "[r]equire reporting of numbers of potentially exposed workers from industrial facilities that process asbestos." On December 22, 2020, Judge Chen finally directed EPA to issue a rule under TSCA section 8(a) requiring this reporting as ADAO's petition had requested in 2018. His order emphasized that "EPA lacked basic information about the volumes in which asbestos-containing products are produced or imported, the sites where they are used, and the number of exposed individuals" 508 F. Supp. 3d at 726. EPA's recently proposed asbestos reporting rule may provide this information but not in time to inform the Economic Analysis for the Part 1 rule.

Under these circumstances, EPA should at least develop an upper bound estimate of cancer risk based on the estimate in its 2020 draft risk evaluation. That estimate (nearly 32,000,000 workers and consumers) is 39,000 times greater than the estimate used in the Economic Analysis (820 workers and

---

[47] Draft risk evaluation at 223.

[48] Economic Analysis, at ES-6.

[49] EPA Office of Pollution Prevention and Toxics, *Problem Formulation of the Risk Evaluation for Asbestos* (problem formulation), May 2018, https://www.epa.gov/sites/production/files/2018-06/documents/asbestos_problem_formulation_05-31-18.pdf, at 27.

[50] Overall, because only EPA received only a "handful" of voluntary submissions from industry, the draft evaluation recognized that "there are many uncertainties with respect to the extent of use, the number of workers and consumers involved and the exposures that might occur from each activity." Draft Evaluation at 193.

consumers) and would result in a significantly greater upper bound for the number of cancer deaths avoided by the Part 1 rule.

- **Assuming PPE use in the exposure baseline for determining risk reduction under the rule is contrary to EPA policy and overstates the effectiveness of PPE**

For the chlor-alkali industry, EPA's analysis of benefits "assumes half of all workers use PPE respirators with an Assigned Protection Factor ("APF") of 10 and the other half use PPE respirators with an APF of 25." In making this assumption, EPA acknowledges that before "resorting to compliance through using PPE, engineering or administrative controls should be used to lower exposure to below the action level." Nonetheless, without explanation, the Economic Analysis indicates that "for the purpose of estimating costs and benefits, it is assumed that PPE is used."[51]

By assuming the use of respirators in determining the baseline exposure levels for chlor-alkali workers, EPA's Economic Analysis reduces estimated cancer risk benefits by 10-25 fold. For example, the Analysis indicates that "the average chlor-alkali worker exposure after accounting for baseline PPE usage is 7% of what the exposure would be with no PPE usage."[52]

These exposure reductions presume that respirators are worn in compliance with OSHA requirements and dependably and reliably achieve their target protection factors. But this assumption is universally recognized to be incorrect. In its reviews of the first 10 risk evaluations, the SACC cautioned repeatedly against reliance on respirators and other PPE for risk determinations. For example, in reviewing the 1,4-dioxane evaluation, the SACC concluded that the "consensus of the Committee believes that PPE may not be consistently and properly worn, as EPA assumed" and that "8-hour use of PPE should not be used in the risk characterization of inhaled 1,4-Dioxane. Risk estimates should be presented without the use of PPE as a reasonable worst case."[53]

The SACC report on 1-BP indicated that "[p]ersons familiar with PPE use realize that nominal protection factors may not be achieved in actual practice"[54] and concluded that EPA "[a]ssumptions about PPE use are likely unrealistic for many of the scenarios and so the determination of whether a condition of use results in an acceptable or unacceptable risk should be based on no PPE use."[55]

The SACC report on the methylene chloride risk evaluation reinforces these points, stating that "[m]ost Committee members agreed that EPA's assumptions of PPE use likely do not reflect actual conditions in most workplaces."[56] The SACC added that:[57]

> "The Agency's reliance on appropriate use of personal protective equipment (PPE), including both respirators and gloves, is not supported by current research literature or

[51] Economic Analysis, at 4-9, 4-15.

[52] Id, at 4-15.

[53] SACC Report for HBCD and 1,4-Dioxane at 53.

[54] SACC Report on 1-BP, at 30-31.

[55] Id. at 66.

[56] SACC Report on methylene chloride, at 17.

[57] Id. at 36.

Asbestos Disease Awareness Organization
1525 Aviation Boulevard, Suite 318 · Redondo Beach · California · 90278 · (310) 251-7477

> industrial hygiene practice. The mere presence of a regulation requiring respirators does not mean that they are used or used effectively. Inadequacies in respirator programs are documented. Respirators require multiple respiratory protection (RP) compliance factors in order to perform as certified. Brent et al. (2005) used data from the NIOSH and Bureau of Labor Statistics (BLS) joint survey on Respirator Usage in Private Sector Firms, (BLS, 2001) to examine the adequacy of respirator protection programs in private industries. They found "large percentages of establishments requiring respirator use [under OSHA or the Mine Safety and Health Administration (MSHA) regulations] had indicators of potentially inadequate respirator programs." Later, Janssen et al. (2014) reported that 'APFs do not apply to RPD used in the absence of a fully compliant RP program; less than the expected level of protection is anticipated in these situations.' Moving beyond program elements, the frequency of proper use of gloves and respirators is largely unknown."

Consistent with these findings, EPA's draft risk evaluation stressed that respirator use was uneven and limited during chlor-alkali production. ACC submissions indicated that "workers wear respiratory PPE during three tasks (Asbestos Unloading/Transport, Glovebox Weighing and Asbestos Handling, and Hydroblasting), but do not wear respiratory PPE during five of the tasks (Asbestos Slurry, Depositing, Cell Assembly, Cell Disassembly, and Filter Press)." These submissions also revealed that, where used, "respiratory PPE is not worn throughout an entire 8-hour shift."[58] Moreover, EPA noted that workplace asbestos levels were no lower and in some cases higher for tasks requiring PPE than for tasks lacking PPE. Finally, since "respiratory PPE is not worn for all worker tasks where occupational exposure monitoring data indicates the presence of airborne asbestos fibers, the potential [exists] for released asbestos fibers to settle and to again become airborne, putting workers at risk of additional exposure.[59]

As discussed above, since finalizing the asbestos Part 1 evaluation, EPA has announced that, in accordance with SACC recommendations, it now "believes it is appropriate to evaluate the levels of risk present in baseline scenarios where PPE is not assumed to be used by workers."[60] As it explained:[61]

> "EPA cannot reasonably assume that all facilities will have adopted these practices. Therefore, EPA is making its determination of unreasonable risk from a baseline scenario that does not assume compliance with OSHA standards, including any applicable exposure limits or requirements for use of respiratory protection or other PPE. This reflects EPA's recognition that unreasonable risk may exist for subpopulations of workers that may be highly exposed because they are not covered by OSHA standards, or because their employer is out of compliance with OSHA standards, or because EPA finds unreasonable risk for purposes of TSCA notwithstanding existing OSHA requirements."

---

58 Draft Evaluation at 220.

59 Id. at 221.

60 87 Fed. Reg. 38747, 38750 (June 19, 2022)(Revised HBCD Risk evaluation).

61 Id., at 38754

Since the level of exposure on which EPA now bases its TSCA risk determinations assumes no use of PPE, the baseline level of exposure used to estimate the benefits of its Part 1 rule should be increased to incorporate the same assumption. EPA's cost-benefit analysis for Part 1 should be revised accordingly, resulting in a substantial increase in estimated risk reduction from the proposed rule. Based on EPA's statement that asbestos exposure using PPE is 7 percent of exposure without PPE, estimated risks would be 14 times higher under the no PPE scenario.

- **EPA fails to account for the reduction in cancer risk at other stages of the asbestos life-cycle in the chlor-alkali industry**

As noted above, exposure to asbestos during the chlor-alkali life-cycle likely occurs in countries where asbestos is mined, packaged and exported; during importation, distribution and unloading at chlor-alkali plants in the US; and at disposal sites to which asbestos wastes from the diaphragm process are transported and then managed. EPA has made no effort to quantify the numbers of workers and consumers who might be exposed during these activities, the levels of exposure and the resulting risks of lung cancer and mesothelioma. This lack of data and analysis makes it impossible to estimate the health benefits of eliminating or reducing exposure during these activities. However, it is important for EPA to *qualitatively* recognize these benefits so they are not excluded entirely from its cost-benefit analysis and inform the selection of regulatory options.[62] Similarly, EPA should recognize the benefits of reducing risks to families of asbestos workers who may develop cancer and mesothelioma because of exposure to contaminated clothing brought home from the workplace.

- **EPA should also recognize the benefits of preventing harms of asbestos exposure that are identified but not quantified in the Part 1 evaluation**

As noted above, EPA developed quantitative risk estimates for lung cancer and mesothelioma but did not quantify the additional risks from other diseases linked to asbestos, including ovarian cancer, laryngeal cancer, cancers of the pharynx, colorectum, and stomach and respiratory diseases such as asbestosis. Eliminating these risks is an important health benefit of the Part 1 proposal and, if it cannot be monetized, it should at least receive *qualitative* recognition in the Economic Analysis so it is considered in decision making.

- **Risk reduction benefits based on a 3 percent discount rate should be weighted more heavily than those based on a 7 percent rate**

Consistent with OMB guidelines, EPA has calculated the present value of future risk reduction benefits using discount rates of 3% and 7%. However, OMB's Circular A-4 specifies that a 3% rate is

---

62 *See The TSCA Modernization Act of 2015, Hearing on H.R. 2576 Before the Subcomm. on Environment and the Economy of the H. Comm. on Energy and Commerce*, 114th Cong. 26 (2015) (describing the importance of improving the agency's discretion to consider non-quantifiable benefits in the final bill, and noting that "the risks that we are looking at are often not quantifiable but the costs almost always are . . ." *See also Entergy Corp. v. Riverkeeper, Inc.*, 556 U.S. 208, 235 (2009) (Breyer, J., concurring in part and dissenting in part) (writing approvingly of EPA's ability to "describe environmental benefits in non-monetized terms and to evaluate both costs and benefits in accordance with its expert judgment and scientific knowledge").

more appropriate when the regulation primarily affects the public.[63] Subsequently, economics research has found that lower discount rates are better suited to assessing public policies that achieve benefits over a long time horizon, such as reductions in the incidence of cancers from chemical exposures that have long latency periods.[64] Thus, EPA's Economic Analysis for the Part 1 rule should give priority to benefits estimates based on a 3% discount rate. These benefits will be substantially larger than with a 7% discount rate, particularly if EPA adds an upper bound estimate of the size of the exposed population and no longer assumes use of PPE, as recommended above.

B. EPA's Determination of the Proposed Rule's Benefits Should Include the Reduction of Harmful Emissions

EPA's Economic Impact Analysis includes a detailed plant-by-plant analysis of the reductions in energy use from replacing energy-intensive asbestos diaphragm plants with more efficient membrane cell technology. As EPA indicates, these energy savings will translate into reduced emissions of both criteria pollutants (NO_x, SO_2 and $PM_{2.5}$) and greenhouse gasses (CO_2). EPA then monetizes the benefits of these emission reductions. Unaccountably, however, these benefits are not included in EPA's cost benefit analysis but presented only as part of a separate sensitivity analysis.

As shown below, EPA's annualized estimates of health benefits from reducing criteria pollutant emissions are $43-47 million:

---

63 Off. of Mgmt. & Budget, Circular A-4: Regulatory Analysis 33 (2003), https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf.

64 *See, e.g.*, Council of Economic Advisers, Discounting for Public Policy: Theory and Recent Evidence on the Merits of Updating the Discount Rate 2 (2017); Moritz A. Drupp et al., *Discounting Disentangled*, 10 Am. Econ. J. Econ. Pol'y 109, 118 (2018) (finding that experts on social discounting recommend, on average, a social discount rate of 2% when assessing the present value of benefits that accrue over long timeframes).

Table 4-24: Estimated Health Benefits in a Single Year Due to Potential Criteria Air Pollutant Reductions Based on Full Conversion to Membrane Cells (2020$, millions)						
Company	**Plant Location**	**Estimated 2021 Asbestos Diaphragm Cell Capacity (1000 m. tons)**	**Annual Health Benefits – Low, 3%**	**Annual Health Benefits – High, 3%**	**Annual Health Benefits – Low, 7%**	**Annual Health Benefits – High, 7%**
Occidental Chemical Corporation	Oxy - Wichita, KS	171	$3	$3	$2	$2
	Oxy - Convent, LA	398	$6	$6	$5	$5
	Oxy - Taft (Hanhnville), LA	323	$5	$5	$4	$4
	Oxy - Niagara Falls, NY	170	$1	$1	$1	$1
	Oxy - La Porte (Battleground), TX	527	$8	$8	$7	$7
	Oxy - Gregory (Ingleside), TX	607	$2	$3	$2	$2
Olin Corporation	Olin - Plaquemine, LA	768	$11	$11	$10	$10
	Olin - Freeport, TX	1,227	$5	$5	$4	$5
Westlake Chemical Corporation	Westlake - Plaquemine, LA	427	$6	$6	$6	$6
		TOTAL	**$47**	**$48**	**$43**	**$43**

Estimates of annualized climate benefits from reducing CO_2 emissions are $10-99 million:

Table 4-23: Estimated Climate Benefits from 2025 CO_2 Reductions Based on Full Conversion to Membrane Cells		
Discount Rate	**Interim Global SC-CO_2 for 2025 (2020 Dollars$/metric ton CO_2)**	**Climate Benefits from 2025 Emissions Reductions (2020 Dollars)**
5% Average	$17	$10,003,892
3% Average	$56	$32,953,997
2.5% Average	$83	$48,842,531
3% 95th Percentile	$169	$99,450,454

EPA offers no rationale for not incorporating these substantial benefits in its cost-benefit analysis where (together with our other recommended adjustments) they would substantially increase the net

benefits of the Part 1 rule. That they are "co-benefits") is not a justification for excluding them. OMB Circular A-4 explicitly requires agencies to consider indirect benefits, specifying that agencies should include any "favorable impact . . . secondary to the statutory purpose of the rulemaking."[65] EPA's own cost-benefit guidelines likewise instruct the agency to assess "all identifiable costs and benefits," including direct effects "as well as ancillary [indirect] benefits and costs."[66]

Accordingly, EPA's estimates of air pollution climate benefits should be part of its cost-benefit analysis.

VIII. EPA Has Not Conducted an Adequate Analysis of Disposal Risks for the Six COUs and Justified the Effectiveness of its Disposal Requirements under TSCA

Although EPA's final asbestos Part 1 evaluation makes findings of unreasonable risk from asbestos disposal for some COUs, these risk determinations are supported by limited analysis.[67] They also fail to address all aspects of disposal, including not just handling of asbestos waste at use and processing sites, but off-site transfer and waste management at landfills and other facilities. EPA's Part 1 risk management proposal incorporates by reference restrictions of asbestos disposal under regulations under two other statutes – OSHA's Asbestos General Industry Standard in 29 CFR 1910.1001 and the National Emission Standards for Hazardous Air Pollutants ("NESHAP") for asbestos under the Clean Air Act.

It may well be that these regulations provide sufficient health protection to eliminate unreasonable disposal risks in accordance with TSCA section 6(a). But EPA has not conducted an analysis that supports this conclusion and thus has failed to justify incorporating the two regulations in its rule under TSCA. We don't object to cross-referencing the regulations in the rule on an interim basis provided that EPA commits to a more comprehensive and rigorous assessment of waste disposal under the TSCA framework. To avoid delaying the Part 1 rule, it may be that this assessment is best undertaken under the Part 2 asbestos evaluation, where EPA will need to examine risks from disposal of legacy asbestos, which is now subject to the OSHA and NESHAP requirements, and could also address the risks of asbestos disposal at industrial facilities. Once EPA makes risk determinations for asbestos disposal in the Part 2 evaluation, it would be in a position to strengthen current asbestos disposal regulations if necessary for the elimination or unreasonable risks.

Conclusion

ADAO applauds EPA's Part 1 proposal as a strong and overdue step to reduce asbestos risk and exposure in the U.S. We support banning the six chrysotile asbestos COUs addressed in the proposal and agree with EPA that asbestos should be phased out in the chlor-alkali industry within two years. However, because it only applies to one fiber and six COUs, the proposed rule is not a full asbestos ban and would not protect the public from the five remaining fibers or additional COUs beyond the

---

[65] *See* Circular A-4, at 26.

[66] EPA, Guidelines for Preparing Economic Analyses 11-2 (2020).

[67] It is surprising that no unreasonable risk finding is made for waste disposal by the chlor-alkali industry, which generates and handles large amounts of asbestos waste, which is managed on-site or at landfills.

scope of the proposal. To address the gaps in protection, we strongly support pending legislation in the House and Senate that would impose a comprehensive and fully protective ban on asbestos.

We would be pleased to answer any questions about our comments.

Respectfully submitted,

Linda Reinstein
Asbestos Disease Awareness Organization
President and Cofounder

Robert M Sussman
Sussman & Associates
ADAO Counsel

July 13, 2022