ORAL ARGUMENT NOT YET SCHEDULED

No. 24-1135

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

DENKA PERFORMANCE ELASTOMER LLC,

Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY et al.,

Respondents.

RESPONDENT-INTERVENORS' RESPONSE IN OPPOSITION TO THE MOTION FOR STAY

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GLOSSARY

EPA	U.S. Environmental Protection Agency
SOCMI	Synthetic Organic Chemical Manufacturing Industry

INTRODUCTION

Residents of St. John the Baptist Parish, Louisiana suffered the highest cancer risk from toxic air pollution in the country in 2014—over 15 times EPA's threshold for acceptable cancer risk.[1] EPA attributed 85 percent of that cancer risk to chloroprene emissions.[2] There is one chloroprene emitter in St. John: Denka Performance Elastomer LLC ("Denka"). Today, St. John residents, including over 10,000 children, still face an extremely high cancer risk from Denka's chloroprene emissions.

Respondent-Intervenors—including some St. John residents—oppose Denka's stay motion, which seeks to block its 90-day deadline to comply with EPA's rule setting air toxics standards for Denka and other facilities ("Rule").[3] 89 FR 42,932 (May 16, 2024).

This Court should deny the motion because Denka has failed to meet its demanding burden to demonstrate that such extraordinary relief is warranted. On the merits, Denka's claim that EPA's decision to establish this deadline was arbitrary and unforeseeable is wrong. EPA's approach is consistent with the plain

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[1] EPA, *2014 National Air Toxics Assessment* (Aug. 22, 2018), https://gispub.epa.gov/NATA/.

[2] *Id.*

[3] Respodent-Intervenors are Concerned Citizens of St. John, Rise St. James Louisiana, Louisiana Environmental Action Network, Texas Environmental Justice Advocacy Services, Air Alliance Houston, California Communities Against Toxics, Environmental Defense Fund, Environmental Integrity Project, and Sierra Club.

language of the Clean Air Act, which establishes a default 90-day compliance deadline for such standards. And the agency has explained that this default timeline is warranted here because Denka's pollution is imminently and substantially endangering surrounding communities—as evidenced by EPA's separate enforcement action against Denka. EPA's timeline was also entirely foreseeable because it adopted the statute's default period and numerous commenters urged the agency to do so.

Denka's claims of irreparable harm fare no better. If compliance with the deadline actually caused irreparable harm, Denka could have sought—and can still seek—a waiver to extend it. It has chosen not to. And Denka has told its investors that, regardless of the Rule, the fate of its plant will be a "business" decision based on "future demand."

Finally, the public interest weighs heavily against a stay. Granting it would prolong communities' exposure to toxic and cancer-causing pollution—including for those Respondent-Intervenors who live on Denka's fenceline.

BACKGROUND

I. Health Crisis in St. John the Baptist Parish

Denka, a neoprene production facility formerly owned by Dupont, has emitted chloroprene in St. John since 1969. Chloroprene can cause severe short- and long-term health issues, including damaging the nervous, cardiovascular, gastrointestinal, renal, hematological, and immune systems.[4] EPA concluded it is "likely to be carcinogenic to humans."[5] In the case of chloroprene, cancer risk is cumulative, and there is no safe level of exposure.[6]

Denka's chloroprene emissions have created a public health crisis in St. John. After EPA concluded that St. John residents suffered the highest cancer risk from toxic air pollution in the country due to Denka's chloroprene emissions, it started air monitoring on Denka's fenceline.[7] In 2016, this monitoring showed chloroprene concentrations that created 765 times EPA's acceptable cancer risk benchmark.[8] Although Denka's chloroprene emissions are lower today than in

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[4] *See* EPA, Toxicological Review of Chloroprene 44, 92, 96, 97, EPA-HQ-OAR-2022-0730-0078 (Sept. 2010).
[5] *Id.* at 96.
[6] *See* EPA, Guidelines for Carcinogenic Risk Assessment 3-26 (March 2005), https://www.epa.gov/sites/default/files/2013-09/documents/cancer_guidelines_final_3-25-05.pdf; NIOSH, Current Intelligence Bulletin 68: NIOSH Chemical Carcinogen Policy 20 (July 2017) ("for most carcinogens"—i.e., those with a linear dose response, like chloroprene—"there is no known safe level of exposure"), https://www.cdc.gov/niosh/docs/2017-100/default.html.
[7] *See* EPA, *2014 National Air Toxics Assessment* (Aug. 22, 2018), https://gispub.epa.gov/NATA/.
[8] EPA's benchmark for acceptable cancer risk is 100-in-1 million and below. EPA determined that concentrations of chloroprene greater than 0.2 $\mu g/m^3$ create an unacceptable cancer risk. *See* EPA Memo, Re: Preliminary Risk-Based Concentration Value for Chloroprene in Ambient Air (May 5, 2016), https://www.epa.gov/sites/default/files/2016-06/documents/memo-prelim-risk-based-concentrations050516.pdf. That is, for every million people exposed to 0.2 $\mu g/m^3$ of chloroprene continuously for 70 years, 100 might develop cancer. EPA *See* EPA, DENKA Air Monitoring Summary Sheet May 25, 2016 – Sept. 26, 2020,

2016, they still create a level of cancer risk multiple times EPA's benchmark. As recently as October 2022, Denka's own monitoring found concentrations 590 times EPA's benchmark.[9]

Children are particularly vulnerable to chloroprene's health harms and accumulate lifetime cancer risk faster than adults do. 89 FR at 43,058. An expert retained by EPA determined that a child living near one of Denka's air monitors along the plant's fenceline would accrue nearly triple the "acceptable" lifetime cancer risk by the age of two—before she could even attend school.[10] Nearly a quarter of the 42,000 residents in St. John—over 10,000 people—are 18 years old or younger.[11] Over four hundred children attend Fifth Ward Elementary School, just 2,000 feet from Denka.[12]

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https://www.epa.gov/system/files/documents/2021-12/r6_summary_through_september_26_2020.pdf (153 μg/m^3 on Nov. 21, 2016 at Acorn and Hwy 44).

[9] Denka, Monitoring Data for July 4, 2022 through Nov. 29, 2023, https://www.epa.gov/system/files/documents/2024-01/denka-summa-monitoring-summary-july-2022-november-2023.xlsx (118 μg/m^3 on Oct. 10, 2022 at Western).

[10] *See* Vandenberg Decl. ¶65 (DN 9-6), *U.S. v. Denka* (Ex. B) (based on 2018-2023 data); *see also id.* ¶67.d.

[11] *Quick Facts: St. John the Baptist Parish*, U.S. Census Bureau, https://www.census.gov/quickfacts/fact/table/stjohnthebaptistparishlouisiana (last accessed June 10, 2024).

[12] Fifth Ward Elementary School, *Our Mission Statement*, https://fwe.stjohn.k12.la.us/ (last visited June 10, 2024).

II. United States' Enforcement Action Against Denka

In 2023, the United States brought an enforcement action against Denka under its Clean Air Act emergency powers—powers it has rarely invoked—to address the "imminent and substantial endangerment." 42 U.S.C. § 7603; Compl. (DN 1), *U.S. v. Denka*, No. 23-cv-735 (E.D. La. Feb. 28, 2023) (Ex. A). The United States seeks injunctive relief requiring Denka to "immediately take all necessary measures to eliminate the imminent and substantial endangerment posed by chloroprene emissions from the Facility." Compl. at 20 (Ex. A); *see* Mot. for Prelim. Inj. (DN 9) (seeking immediate and longer-term pollution controls).

III. The Rule

To address the health crisis in St. John and to fulfill its statutory obligations under the Clean Air Act, EPA also issued this Rule. 89 FR 42,932. The Rule sets emission standards for hazardous air pollution from the Synthetic Organic Chemical Manufacturing Industry ("SOCMI") and the Polymers and Resins Industry, including Denka.

Every eight years, EPA must review emission standards and promulgate either a revision of the standards or a determination that no revision is "necessary." 42 U.S.C. § 7412(d)(6). Within eight years of promulgating section 112(d) standards, EPA must assess any remaining risk and promulgate standards if required "to provide an ample margin of safety to protect public health ... or to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect." *Id.* § 7412(f)(2)(A).

By statutory default, section 112(f) standards apply 90 days after a rule's effective date. *Id.* § 7412(f)(4)(A). EPA "may grant a waiver permitting such source a period of up to 2 years after the effective date of a standard to comply," but only if EPA finds: (1) "that such period is necessary for the installation of controls," and (2) "that steps will be taken during the period of the waiver to assure that the health of persons will be protected from imminent endangerment." *Id.* § 7412(f)(4)(B). If a source requests a waiver, it must do so according to the procedures set out in 40 C.F.R. § 63.6(i)(6)(i). Even if the above-described conditions are met, EPA still retains discretion to grant or deny such a request. *See* 42 U.S.C. § 7412(f)(4)(B) (EPA "may grant a waiver") (emphasis added); *U.S. v. Hoechst Celanese Corp.*, 128 F.3d 216, 230 (4th Cir. 1997) (noting that granting a waiver is within EPA's discretion).

In this Rule, EPA finalized emission standards under sections 112(d)(6) and 112(f)(2) for SOCMI and Polymers and Resins sources years after the statutory deadlines passed and only after many Respondent-Intervenors successfully sued EPA to compel these overdue and required rulemakings.[13]

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[13] *See* Consent Decree, DN 39-1 at 4-5, *Environmental Integrity Project et al. v. EPA*, 20-cv-3119 (D.D.C. Aug. 24, 2022) (resolving certain claims brought by

The Rule's emission standards reduce pollution from about 200 sources that collectively emit more than 8,000 tons per year of hazardous air pollutants.[14] It will reduce more than 6,200 tons a year of over 100 different pollutants, including 14 tons per year of chloroprene.[15]

EPA required neoprene production sources—currently only Denka—to comply with the Rule's chloroprene requirements by October 15, 2024, 89 FR at 42,955, which is the statutory default of 90 days after the Rule's effective date, 42 U.S.C. § 7412(f)(4)(B). EPA supported this 90-day compliance deadline on the basis of its ongoing section 303 action against Denka, which includes extensive documentation of endangerment. EPA expressly provided that sources may apply to waive and extend the 90-day deadline based on showings of need and protection from imminent endangerment during the extension. *Id.*; 89 FR at 42,955.

Now, Denka seeks to delay implementation of these standards by moving to stay its 90-day compliance deadline—without taking steps to protect St. John's residents from imminent endangerment.

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several Respondent-Intervenor groups); Consent Decree, DN 26 at 3-4, *Texas Environmental Justice Advocacy Services et al. v. EPA*, 20-cv-3733 (D.D.C. Feb. 24, 2022) (same).

[14] *See* 89 FR at 43,030; Residual Risk Assessment for SOCMI 5, EPA-HQ-OAR-2022-0730-0085 (Mar. 2023).

[15] 89 FR at 43,030; EPA, Fact Sheet (Apr. 9, 2024), https://www.epa.gov/system/files/documents/2024-04/chem-sector-final-rule.-overview-fact-sheet_0.pdf.

STANDARD OF REVIEW

A stay pending appeal is an "extraordinary remedy." *Cuomo v. U.S. Nuclear Regul. Comm'n*, 772 F.2d 972, 978 (D.C. Cir. 1985). A movant must show (1) a likelihood of success on the merits; (2) irreparable harm absent a stay; (3) a lack of harm to other parties from a stay; and (4) that the public interest supports a stay. *Nken v. Holder*, 556 U.S. 418, 434 (2009). A movant must show irreparable harm that is "imminen[t]," *Chaplaincy of Full Gospel Churches v. England*, 454 F.3d 290, 297 (D.C. Cir. 2006), "certain and great," and "directly result[ing] from the action," *Wis. Gas Co. v. FERC*, 758 F.2d 669, 674 (D.C. Cir. 1985). A "possibility" of "other corrective relief … weighs heavily against a claim of irreparable harm." *Va. Petrol. Jobbers Ass'n. v. Fed. Power Comm'n.*, 259 F.2d 921, 923 (D.C. Cir. 1958). If a movant cannot show it will likely succeed on the merits or that it will suffer irreparable harm, the Court need not consider the other factors. *See, e.g.*, *Apotex, Inc. v. FDA*, 449 F.3d 1249, 1253-54 (D.C. Cir. 2006) (declining to consider other factors where movant showed "little likelihood" of success on the merits).

ARGUMENT

I. EPA's approach to establishing a compliance deadline for neoprene production sources is reasonable and consistent with the statute.

Denka challenges EPA's 90-day compliance deadline for neoprene production sources as arbitrary and an unforeseeable "surprise." It is wrong across the board.

Denka primarily contends (Mot. 14-18) that EPA's decision to apply a 90-day compliance deadline to neoprene production sources alone arbitrarily singles out Denka. But this argument misunderstands the basic text and structure of the statute and fails to meaningfully grapple with EPA's rationale for its decision.

The plain language of section 112(f)(4)(A) provides that 90 days from a rule's effective date is the <u>default deadline</u> for compliance with standards set under section 112(f). *See* 42 U.S.C. § 7412(f)(4)(A). As described above, the Act authorizes this 90-day timeline to be extended for a period of up to two years, but only if EPA makes specific findings that a source needs an extension <u>and</u> that the source will take certain steps to protect people from imminent endangerment during the extended period. *See* 42 U.S.C. § 7412(f)(4)(A), (B).

To the extent Denka suggests that EPA must make an endangerment finding to adopt the 90-day compliance deadline, it is wrong. That is not what the statute says. *Compare* § 7412(f)(4)(A) (imposing default 90-day compliance deadline for existing sources without any requirement of an endangerment finding) *with*

§ 7412(f)(4)(B) (permitting extension of up to two years where agency finds "the health of persons will be protected from imminent endangerment"). Where Congress intends an endangerment finding to serve as a predicate to some regulatory action, it says so clearly. *See*, *e.g.*, 42 U.S.C. § 7521(a)(1) (new motor vehicle standards for "any air pollutant ... which may reasonably be anticipated to endanger public health or welfare."). It has not done so here.

EPA's approach is not only consistent with the text and structure of section 112(f), but it is also consistent with the agency's past practice. At times, the agency has elected to adopt a 90-day compliance deadline. For instance, when regulating benzene transfer operations, EPA established the default 90-day timeline for installing controls at tank trucks and railcars, with individual sources able to apply for a waiver. 55 FR 8,292, 8,294 (Mar. 7, 1990); *see also* 54 FR 38,044, 38,079 (Sept. 14, 1989) (setting 90-day compliance deadlines for other sources of benzene). And contrary to Denka's suggestion (Mot. 18) that it has been arbitrarily "singled out," EPA has also at times imposed different timelines for different source types falling under the same rule based on their unique characteristics. In the same benzene transfer rule, for example, EPA determined that a longer period was necessary for marine vessel controls and granted a one-year general waiver for those sources. 55 FR at 8,294.

EPA has also set default 90-day compliance deadlines and then exercised its authority to grant or deny specific waivers extending those timelines. *Monsanto v. U.S.*, 19 F.3d 1201, 1208 (7th Cir. 1994) (describing EPA's decision to grant an initial 11-month extension and then deny a later request for more time). In short, EPA's approach here is entirely consistent with this past practice.

Against this statutory backdrop, EPA's burden to show that its decision was not arbitrary is minimal. The agency must only offer a reasoned basis for choosing to apply the default 90-day timeline—which is capable of being extended on a case-by-case basis—instead of choosing to categorically extend compliance deadlines for neoprene production sources, as it did for other sources. "The arbitrary and capricious standard is deferential; it requires that agency action simply be 'reasonable and reasonably explained.'" *Communities for a Better Env't v. EPA*, 748 F.3d 333, 335 (D.C. Cir. 2014) (quoting *Nat'l Telephone Coop. Ass'n v. FCC*, 563 F.3d 536, 540 (D.C. Cir. 2009)).

The rationale EPA supplied easily satisfies this bar. The existence of a section 303 action against Denka—which seeks to remedy Denka's ongoing imminent and substantial endangerment—provides a reasoned basis to subject Denka to a different compliance timeline than other sources covered by the Rule. Indeed, EPA does not lightly invoke its emergency authority under section 303. It has done so only nine times in the last 20 years, and only 13 times total in the history of section 303's existence.[16]

Two recent examples include a St. Croix refinery causing oil droplets to rain on the surrounding community and a paper mill releasing hydrogen sulfide gas into nearby communities.[17] EPA's decision to exercise its emergency authority to address ongoing endangerment issues related to Denka distinguish it from the eighteen other Group I Polymers and Resins sources, all other 200-plus sources covered by the Rule, and nearly all other sources nationwide. And it likewise provides a reasoned basis for EPA's decision to retain the statutory default 90-day compliance deadline for neoprene production sources, while allowing extension if the source adopts adequate measures to address the ongoing imminent endangerment.

Denka attempts to downplay the significance of EPA's enforcement action, arguing (Mot. 11-12) that the proceeding is still ongoing and has yet to result in any final judgment. But EPA need not have secured a final judgment against

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[16] *See* Robert L. Glickman & Johanna Adashek, *Delegated Agency Authority to Address Chemicals of Emerging Concern: EPA's Strategic Use of Emergency Agency Powers to Address PFAS Air Pollution*, 48 HARVARD ENVTL. L. REV. (forthcoming 2024), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4574426.
[17] *See id.* at 53-54; Clean Air Act Emergency Order, *In the Matter of Limetree Bay Terminals, LLC*, No. CAA-02-2021-1003 (May 14, 2021); Clean Air Act Emergency Order, *In the Matter of New-Indy Catawba, LLC d/b/a New-Indy Containerboard* (May 13, 2021).

Denka to support a default 90-day compliance period here. Indeed, as described above, the statute requires no finding *at all* to proceed with the default timeline, so the enforcement action's existence is enough to reasonably support different compliance timelines for Denka from other sources.

The existing record in EPA's 303 action reinforces the soundness of the agency's decision here. That action revealed that "the surrounding communities" to Denka—especially the children living and attending school close by—face substantially increased cancer risk from exposure to Denka's chloroprene emissions. Compl. ¶58 (Ex. A). Hundreds of these children live even closer—within a half-mile from the center of Denka. *Id.* ¶37. Between 2018 and 2023, air monitors within 1,000 feet of Fifth Ward Elementary School measured the highest average chloroprene concentration of all Denka's monitors: 2.89 $\mu g/m^3$, or more than fourteen times higher than the chloroprene concentration that creates unacceptable cancer risk. *See id.* ¶¶43, 47. An EPA expert determined that a child living this close to Denka would accrue nearly triple EPA's "acceptable" lifetime cancer risk by the age of two.[18]

The record also illustrates how Denka is distinct from other chemical plants. For instance, Denka is the only neoprene production source in the nation, is the sole chloroprene emitter in St. John, and is responsible for more than 95 percent of

[18] *See* Vandenberg Decl. ¶65 (Ex. B); *see also id.* ¶67.d.

the reported chloroprene emissions nationwide.[19] And many of these emissions are the result of rudimentary and uncontrolled practices: open-air kettles without enclosures, a "Brine Pit" where Denka dumped wastes to "volatilize chloroprene to the open air" (until EPA forced a shutdown under a separate enforcement settlement),[20] and "certain lax, easy-to-fix, housekeeping practices that EPA inspections have identified as sources of excess chloroprene emissions."[21] As EPA's expert noted, "[c]urrent emission levels will continue unless Denka reduces its emissions."[22]

Against this backdrop, it is reasonable—if not required—for EPA to apply the Act's default compliance deadline and base any extensions on source-specific demonstrations of need and specific steps to protect against imminent endangerment during the extension.

Denka is also wrong to insist (Mot. 18-19) that EPA's Rule reflects an unforeseeable and unlawful change in position. The Rule's compliance deadline is a "logical outgrowth" of the proposed rule. *Fertilizer Inst. v. EPA,* 935 F.2d 1303, 1311 (D.C. Cir. 1991) (internal quotation marks and citation omitted).

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[19] *See id.* ¶13; Compl. ¶28 (Ex. A).
[20] Compl. ¶32 (Ex. A).
[21] Mem. Supp. Mot. Prelim. Inj. at 14 (DN 9-2) (Ex. C).
[22] Vandenberg Decl. ¶69 (Ex. B).

Denka undoubtedly had adequate notice of, and an opportunity to comment on, all relevant parts of the Rule, including the compliance deadline. EPA thoroughly explained its proposed compliance timelines, broadly solicited "general comments on this proposed action," and received thousands of comments—including from numerous commenters who addressed the compliance period. 88 FR 25,080, 25,196 (Apr. 25, 2023); *see id.* at 25,175-79. For instance, community organizations weighed in to "strongly urge EPA to set much shorter compliance dates for the rule's emission standards" to ensure that "the rule's important controls, emission reductions, and monitoring will address the human health impacts from these hazardous emissions as soon as possible."[23] Indeed, Denka commented on the compliance timeframe, telling EPA that it "should allow at least three years for facilities to come into compliance with all the new regulatory requirement[s]."[24] Denka was clearly able to—and did—"offer informed criticism and comments" on the compliance timeframe, *Ethyl Corp. v. EPA*, 541 F.2d 1, 48 (D.C. Cir. 1976), and it "should have anticipated" that certain updates were

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[23] Comments of Respondent-Intervenors et al., EPA-HQ-OAR-2022-0730-0175 (July 7, 2023) [hereinafter Proposed Rule Comments]; *see also* Comment of Moms Clean Air Force, EPA-HQ-OAR-2022-0730-0142 (July 5, 2023) ("We are asking EPA to quickly finalize the strongest possible standards to protect people from petrochemical pollution."); Comment of Sisan Bryan, EPA-HQ-OAR-2022-0730-2203 (May 25, 2023) ("EPA should ... require facilities to comply as promptly as possible.").

[24] Denka Performance Elastomer LLC, Comment 107, EPA-HQ-OAR-2022-0730-0172 (July 7, 2023).

possible, given that this timeframe is the standard established by the statute, *City of Portland, Or. v. EPA*, 507 F.3d 706, 715 (D.C. Cir. 2007) (internal quotation marks and citation omitted). *See* 42 U.S.C. § 7412(f)(4)(A).

That is all that is required to reject Denka's "surprise switcheroo" argument.

II. Denka's decision not to request a compliance waiver from EPA undermines its assertion that the 90-day compliance period is "impossible to meet" and that it will suffer irreparable harm.

Denka premises its stay motion on the claim (Mot. 2) that the statutorily authorized 90-day compliance period is "impossible to meet." It asserts (Mot. 10) that it would "need at least two years to plan, develop, test, and install the controls required by the Rule" and that anything less than a two-year compliance period would be "absurdly short." But even if that were right—as discussed below, that claim is dubious—the Rule explicitly contemplates the possibility that a specific source might have difficulty complying with the deadline and provides a straightforward pathway to extend the compliance deadline, right up to the two years Denka claims it would need. *See* 40 C.F.R. § 63.6(i)(4)(ii). And that extension mechanism follows directly from the Clean Air Act itself. The Act explicitly permits the agency to "grant a waiver permitting ... up to 2 years" after an effective compliance date. 42 U.S.C. § 7412(f)(4)(B).

Denka's decision not to seek an extension under either the Rule or the statute sinks its bid for a stay here. The company does not dispute that these provisions explicitly provide an adequate legal mechanism for extending its compliance timeline; it has just chosen not to pursue it. But, as this Court has made clear, the existence of an adequate legal remedy for an asserted harm makes any alternative equitable intervention—like Denka's stay request—"improper," "apart from any other reason." *Nat'l Enf't Comm'n v. Slim Olson, Inc.*, 221 F.2d 92, 94 (D.C. Cir. 1955). Because both Congress and EPA have already afforded Denka a path to the very relief it now seeks before this Court, its request for a stay should be denied. *See In re GTE Serv. Corp.*, 762 F.2d 1024, 1026 (D.C. Cir. 1985) (denying a request for judicial relief where "a clearly adequate remedy" exists under federal law); *Randolph-Sheppard Vendors of Am. v. Weinberger*, 795 F.2d 90, 109 (D.C. Cir. 1986) (explaining that the existence of a legal remedy "created by statute" establishes "a strong presumption" that it "should be followed").

The Rule's compliance-extension provision also undermines Denka's claim of irreparable harm. Denka asserts (Mot. 20) that unless it "can obtain relief from the 90-day compliance deadline," it "will have to shut down [the plant]" and "likely never restart [it]." But Denka did not seek an extension under section 63.6(i)(4)(ii) and make this argument—along with any appropriate factual support—directly to the agency. *See Randolph-Sheppard*, 795 F.2d at 108 (noting that, "[a]bsent a clear showing of irreparable injury on some additional basis, the failure to exhaust administrative remedies serves as a bar to judicial intervention in the agency process" (internal quotation marks and citation omitted)).

Not only that: Denka *still can* seek an extension. By its terms, the Rule allows a source to seek an extension up to "90 calendar days after the effective date of the relevant standard." 40 C.F.R. § 63.6(i)(4)(ii). As this Court has explained, even the "possibility" that "corrective relief will be available at a later date ... weighs heavily against a claim of irreparable harm." *Va. Petrol.*, 259 F.2d at 925; *see also CityFed Fin. Corp. v. Off. of Thrift Supervision*, 58 F.3d 738, 747 (D.C. Cir. 1995) (rejecting claim of irreparable injury where a party chose not to "pursue[]" available alternative legal remedies). A "threatened injury," in other words, is not irreparable "if there exists a remedy to repair it." *Randolph-Sheppard*, 795 F.2d at 109 (internal quotation marks and citation omitted). So it is here.

Even on its own terms, moreover, Denka's assertion that the Rule's 90-day compliance deadline will force its plant to indefinitely shut down is hard to take seriously. Denka's parent company, Denka Co. Ltd., is a massive multinational conglomerate.[25] Its Louisiana plant represents a small fraction of its business and

[25] *See* Denka, Overseas Subsidiaries and Office, https://www.denka.co.jp/eng/corporate/officeworldwide/ (last accessed June 10, 2024).

has repeatedly lost money for the company.[26] Indeed, even in the wake of EPA's announcement of the Rule, and in response to a question on its impacts, Denka publicly told its investors that any decision over the fate of its chloroprene business would be based on "business" considerations including "future demand" and "production capacity"—not on the Rule's compliance requirements.[27]

III. A stay will harm the public.

While it is enough that Denka cannot show it will likely succeed on the merits or that it will suffer irreparable harm, *see Apotex, Inc.*, 449 F.3d at 1253-54, the balance of equities and the public interest also weigh strongly against Denka's stay motion. *See Amoco Prod. Co. v. Vill. of Gambell*, 480 U.S. 531, 545 (1987) (explaining that because environmental injury "can seldom be adequately remedied by money damages and is often permanent," the balance of harms usually favors the protection of the environment).

Allowing Denka to extend its compliance deadline would prolong Intervenors' and their members' exposure to Denka's toxic pollution. That increased exposure is a harm in and of itself, and that harm is irreparable. *See*,

[26] *See, e.g.*, Denka, *Results Presentation of FY2023*, 5-8, 11 (May 10, 2024), https://www.denka.co.jp/eng/storage/news/pdf/496/20240510_denka_ir_materials_en.pdf (Ex. D).

[27] Denka, *FY2023 Financial Results Presentation Summary of Q&A Session 2* (May 10, 2024), https://www.denka.co.jp/eng/storage/news/pdf/497/20230517_denka_ir_conference_summary_en.pdf (Ex. E).

e.g., *Duke Power Co. v. Carolina Env't Study Grp., Inc.*, 438 U.S. 59, 74 (1978) ("emission of non-natural [pollutant] into appellees' environment would also seem a direct and present injury"); *Clean Wis. v. EPA*, 964 F.3d 1145, 1158 (D.C. Cir. 2020) ("more [pollution] is more [pollution]"). This harm cannot be undone, and it will exacerbate the harm community members have already suffered from Denka's decades of toxic emissions.

A stay would also subject hundreds of thousands of people to increased cancer risk from toxic, carcinogenic pollutants for which there is no safe level of exposure. Cancer risk is cumulative: once accrued, it cannot be eliminated.[28] For a community exposed to under- or unregulated chloroprene since 1969, time is critical. If Denka is given two years to comply with this Rule, babies born today in St. John could accumulate their acceptable lifetime cancer risk or more from Denka's chloroprene emissions alone within that time.[29] When Denka complies with the Rule, on the other hand, the population exposed to cancer risk greater than or equal to 1-in-1 million from Denka's chloroprene pollution would be reduced from 690,000 people to 58,000 people, and the population exposed to a cancer risk of greater than 100-in-1

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[28] *See* Vandenberg Decl. ¶67.d. (Ex. B) ("Moving to a location free of chloroprene emissions will not eliminate the risk already accumulated.").

[29] An expert retained by EPA determined based on 2018-23 data that a child living near the Western fenceline monitor would accrue nearly triple the "acceptable" lifetime cancer risk by the age of two. *Id.* ¶65, ¶67.d.

million—currently 12,000—would be eliminated entirely. 89 FR at 42,962, 42,967.[30]

Additional pollution and cancer risk will particularly harm children and people with the least financial ability to move, afford health care, or seek other protections from air pollution. Of the population that lives within 5 kilometers of Denka, the population that is Black (56 percent) is more than four times the national average, and the percentage of people living below the poverty level and those over the age of 25 without a high school diploma are higher than the national averages. *Id.* at 43,047.

A stay would be particularly unwarranted because St. John residents have been exposed to chloroprene for over 50 years, and the Rule finally provides health protections that Intervenors fought hard to secure. *See* Letitia Taylor Decl. ¶20 (Ex. F) (explaining that St. John residents "felt for a long time that we had no control over this situation," and it was an "overwhelmingly good feeling" to see the final Rule). Staying full implementation of the Rule would deprive Intervenors' members and the public of those hard-won, overdue health protections.

[30] EPA likely underestimates the actual cancer risk because it did not consider aggregate exposures, cumulative exposures to other pollutants, and existing susceptibilities in the community. *See*, *e.g.*, Proposed Rule Comments, *supra* note 23, at 16-17, 24-25.

A further illustration is the declaration of Robert Taylor, founder of Respondent-Intervenor Concerned Citizens of St. John. Mr. Taylor has lived within a mile of Denka since it began operations and has lost five family members to cancer. Robert Taylor Decl. ¶¶3, 5, 10 (Ex. G). His wife, who has had breast cancer, multiple sclerosis, and a rare blood disease, can no longer live in their community because of the air pollution. *Id.* ¶¶11, 12. For Mr. Taylor, "[s]eeing my family and community, especially the young kids, get sick and die is so painful, especially because this is all preventable.… How many of these children are we sending to an early death?" *Id.* ¶¶23, 26.

Denka claims (Mot. 22) that the "stay will not injure other[s]" because "current chloroprene emissions are at an all-time low." But fenceline monitoring data show that Denka's chloroprene emissions still expose St. John residents to concentrations many times greater than EPA's acceptable cancer risk benchmark. Monitoring at Fifth Ward Elementary School from 2023 showed that residents were exposed to chloroprene levels up to 145 times EPA's benchmark for acceptable cancer risk and were regularly exposed to levels at least 20 times that benchmark.[31]

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[31] *See* EPA, EPA Continuous Monitoring Program using SPod - Data for Mar. 2020 through Aug. 2023, https://www.epa.gov/system/files/documents/2024-01/continuous-monitoring-summary-march-10-2020-through-august-16-2023-w-monitor-locations.xlsx (29.042 µg/m^3 on January 5, 2023 at Fifth Ward Elementary

Furthermore, Denka's reliance on average monthly emissions to give an accurate picture of the community's exposure is misplaced, given that averages can skew data on actual exposures depending on sampling periods, number of samples, inclusion of non-detects, and the range of emissions values. In any event, eight of the 21 monitors Denka identified had monthly averages exceeding EPA's acceptable cancer risk benchmark. Absent protective measures, there is no assurance that this toxic pollution and its associated harms will not increase.[32]

The public has a strong interest in finally getting the level of protection from Denka's toxic emissions that Congress intended—and required—EPA's emission standards to provide years ago. 42 U.S.C. § 7412(d)(6), (f)(2); *see also Cuomo*, 772 F.2d at 978 (statutory decrees reflect Congress' decisions about what is in the public interest); *Va. Petrol.*, 259 F.2d at 925 ("interests of private litigants must give way to the realization of public purposes").

CONCLUSION

The Court should deny the motion to stay the Rule.

School); Monitoring Data for July 4, 2022 through Nov. 29, 2023, https://www.epa.gov/system/files/documents/2024-01/denka-summa-monitoring-summary-july-2022-november-2023.xlsx.

[32] *See*, *e.g.*, Vandenberg Decl. ¶69 (Ex. B) ("Current emission levels will continue unless Denka reduces its emissions.").

Dated: June 12, 2024

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CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMIT

Counsel hereby certifies, in accordance with Federal Rule of Appellate Procedure 32(g)(1), that the foregoing motion contains 5,150 words, as counted by counsel's word processing system, and thus complies with the 5,200 word limit. *See* Fed. R. App. P. 27(d)(2)(A).

Further, this document complies with the typeface and type-style requirements of Federal Rule of Appellate Procedure 32(a)(5) and (a)(6) because this document has been prepared in a proportionally spaced typeface using **Microsoft Word for Microsoft 365** using **size 14 Times New Roman** font.

Dated: June 12, 2024

/s/ Adam Kron
Adam Kron

CERTIFICATE OF SERVICE

I hereby certify that on June 12, 2024, I served the foregoing Respondent-Intervenors' Combined Response in Opposition to the Motion for Stay on all registered parties through the Court's electronic case filing (CM/ECF) system.

/s/ Adam Kron
Adam Kron

LIST OF EXHIBITS

Exhibit A	Complaint (DN 1), *United States v. Denka Performance Elastomer, LLC, et al.*, No. 23-cv-735 (E.D. La. Feb. 28, 2023)
Exhibit B	Vandenberg Declaration (DN 9-6), *United States v. Denka Performance Elastomer, LLC, et al.*, No. 23-cv-735 (E.D. La. March 20, 2023)
Exhibit C	U.S. Memorandum in Support of Motion for Preliminary Injunction (DN 9-2), *United States v. Denka Performance Elastomer, LLC, et al.*, No. 23-cv-735 (E.D. La. March 20, 2023)
Exhibit D	Denka, *Results Presentation of FY2023* (May 10, 2024)
Exhibit E	Denka, *FY2023 Financial Results Presentation Summary of Q&A Session* (May 10, 2024)
Exhibit F	Declaration of Letitia Taylor
Exhibit G	Declaration of Robert Taylor

EXHIBIT A

Complaint (DN 1), *United States v. Denka Performance Elastomer, LLC, et al.*, No. 23-cv-735 (E.D. La. Feb. 28, 2023)

IN THE UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF LOUISIANA

UNITED STATES OF AMERICA, Plaintiff, v. DENKA PERFORMANCE ELASTOMER, LLC and DUPONT SPECIALTY PRODUCTS USA, LLC, Defendants.	Civil Action No. 2:23-cv-735

COMPLAINT

Plaintiff, the United States of America ("United States"), by authority of the Attorney General of the United States and through the undersigned attorneys, acting at the request of the Administrator of the United States Environmental Protection Agency ("EPA"), files this Complaint and alleges:

NATURE OF ACTION

1. This is a civil action alleging that carcinogenic chloroprene emissions from Defendant Denka Performance Elastomer, LLC's ("Denka's") neoprene manufacturing operations at the Pontchartrain Works Site in St. John the Baptist Parish, Louisiana (the "Facility") present an imminent and substantial endangerment to public health and welfare. The Facility's address is in LaPlace, Louisiana, but its chloroprene emissions also travel into other nearby communities in the Parish, such as Reserve and Edgard, Louisiana. People living in these communities are being exposed to an unacceptably high risk of developing certain cancers because of Denka's chloroprene emissions. The United States seeks injunctive relief under

Clean Air Act Section 303, 42 U.S.C. § 7603, requiring that Denka immediately reduce its chloroprene emissions to levels that no longer cause or contribute to unacceptably high cancer risks within the communities surrounding the Facility.

2. This civil action also seeks relief from DuPont Specialty Products USA, LLC ("DuPont Specialty Products") based on Fed. R. Civ. P. 19(a) and the All Writs Act, 28 U.S.C. § 1651. DuPont Specialty Products owns the land at the Pontchartrain Works Site on which Denka's neoprene manufacturing operations are located. DuPont Specialty Products is Denka's landlord and leases that land on which the neoprene manufacturing operations are located to Denka pursuant to a "Ground Lease." Accordingly, Denka may need DuPont Specialty Products' permission or cooperation to comply with the Court's orders in this matter. The Ground Lease requires Denka to obtain DuPont Specialty Products' consent before undertaking certain construction activities or equipment modifications involving the neoprene manufacturing operations.

3. Chloroprene is a liquid raw material that is used to produce neoprene. It is colorless, flammable, and readily evaporates at room temperature. Chloroprene is produced using toxic substances, including 1,3-butadiene and chlorine. And it is, itself, defined by the Clean Air Act as a hazardous air pollutant. *See* 42 U.S.C. § 7412(b)(1).

4. Chloroprene is hazardous, in part, because it is a likely human carcinogen. Breathing chloroprene increases the risk of developing cancers, such as lung and liver cancer, over the course of a lifetime. Chloroprene acts via a mutagenic "mode of action," meaning that when a person breathes chloroprene, it causes mutations in the body's cells. These mutations increase the likelihood that a person who breathes chloroprene will develop certain cancers over the course of their lifetime.

5. Infants and children younger than 16 are likely to be especially susceptible to chloroprene's cancer-causing effects. Chloroprene exposure during a person's early years is therefore particularly significant to their lifetime risk of developing cancer.

6. The concentrations of airborne chloroprene in the communities surrounding the Facility are exposing thousands of people living there, including children younger than 16, to lifetime cancer risks that are multiples higher than what is typically considered acceptable by several United States regulatory agencies charged with protecting human health. And the only source of chloroprene emissions in St. John the Baptist Parish is Denka's neoprene manufacturing operations at the Facility.

7. A 1-in-10,000 cancer risk is a generally accepted threshold for demarcating the ceiling for acceptable excess cancer risk, and it is a benchmark for the level of cancer risk that is considered important to address in most instances by regulatory agencies. For example, the EPA's policy for setting national emission standards for hazardous air pollutants, like chloroprene, that are emitted by industrial source categories uses a presumptive 1-in-10,000 upper threshold for acceptable excess lifetime cancer risk. *See* 54 Fed. Reg. 38,044, 38,045 (Sept. 14, 1989) (the EPA's "1989 Residual Risk Policy"). Congress subsequently endorsed this policy in amendments to the Clean Air Act. *See* 42 U.S.C. § 7412(f)(2)(B). Other EPA non-air programs also rely on a 1-in-10,000 excess cancer risk as a presumptive risk management standard. *See* 40 C.F.R. § 300.430(e)(2)(i)(A)(2) (explaining Superfund remedial action cleanup goals). And other federal agencies, like the National Institute for Occupational Safety and Health ("NIOSH"), also use a 1-in-10,000 excess cancer risk as a threshold for taking action to address cancer risk. *See* Current Intelligence Bulletin 68 - NIOSH Chemical Carcinogen Policy (July 2017).

8. The EPA estimates that breathing chloroprene at concentrations averaging 0.2 micrograms of chloroprene per cubic meter (0.2 $\mu g/m^3$) over a 70-year lifetime increases a person's risk of developing cancer by 1-in-10,000. And the greater the average chloroprene concentration that a person is exposed to, the faster their chloroprene related cancer risk accumulates. As people breathe chloroprene at long-term average concentrations greater than 0.2 $\mu g/m^3$, their risk of developing cancer as a result of that exposure will reach and exceed 1-in-10,000 sooner than 70 years.

9. Average concentrations of airborne chloroprene near the Facility have been consistently greater than 0.2 $\mu g/m^3$ since at least 2016, and likely for years before then. Two sets of air monitoring stations were installed in 2016 at several locations near the Facility – one set was installed by the EPA, the other by Denka. Each set of air monitors measured chloroprene concentrations in the ambient air. Air monitors were installed in residential neighborhoods near the Facility and near schools close to the Facility, including the Fifth Ward Elementary School and East St. John High School.

10. Both sets of air monitors detected chloroprene at average concentrations that were consistently much greater than 0.2 $\mu g/m^3$. The air monitors located in the residential neighborhoods just west of the Facility detected some of the highest chloroprene levels.

11. At the average chloroprene concentrations currently being detected, people are being exposed to risks of developing chloroprene-related cancers that are as much as an order of magnitude greater than multiple federal agencies' presumptive benchmark for acceptable excess lifetime cancer risk. At the average chloroprene concentrations currently being detected, people exposed to these concentrations will reach unacceptably high cancer risks much sooner than over a 70-year lifetime. For example, infants born today in the communities surrounding the Facility

who are exposed to the highest measured levels of chloroprene from Denka's neoprene manufacturing operations will exceed an estimated *lifetime* of acceptable excess cancer risk within approximately their first two years of life.

12. Many people living near Denka's neoprene manufacturing operations already have been exposed to unacceptably high excess cancer risks. The neoprene manufacturing operations at the Pontchartrain Works Site have existed for decades, and people have lived there just as long. Those people have been breathing the air there for decades, and the Facility historically emitted even higher levels of chloroprene than it does today. Those individuals' cancer risk increases every day they continue to breathe Denka's chloroprene emissions.

13. The increased cancer risk that the communities near the Facility are currently being exposed to because of Denka's chloroprene emissions presents an imminent and substantial endangerment to public health and welfare. The endangerment is imminent because Denka emits chloroprene at levels that are producing unacceptably high risks of cancer to the people, including children, that are regularly exposed to the Facility's emissions. Hundreds of children attend school near the Facility and currently breathe the air there. Many of them likely also live in the neighborhoods surrounding the Facility.

14. The endangerment is substantial because Denka's emissions of chloroprene cause ambient levels of chloroprene in nearby communities to be many times greater than the generally accepted threshold for demarcating unacceptably high cancer risks, and because children living in these communities and attending the schools close to the Facility are likely to be especially susceptible to the cancer risks posed by chloroprene. Denka's chloroprene emissions are the cause of this endangerment.

15. The United States seeks injunctive relief, pursuant to 42 U.S.C. § 7603, to stop Denka from emitting chloroprene at levels that present an imminent and substantial endangerment to public health and welfare in the communities surrounding the Facility.

JURISDICTION AND VENUE

16. This Court has jurisdiction over the subject matter of this action pursuant to 42 U.S.C. § 7603, and 28 U.S.C. §§ 1331 and 1345.

17. This Court has personal jurisdiction over Denka. Denka is incorporated in the State of Louisiana and does business here, including via its neoprene manufacturing operations at the Facility, which is located in St. John the Baptist Parish at 586 Highway 44, LaPlace, Louisiana, 70068.

18. This Court has personal jurisdiction over DuPont Specialty Products. DuPont Specialty Products conducts business in LaPlace, Louisiana at the Facility.

19. Venue is proper in this District pursuant to 42 U.S.C. § 7603, and 28 U.S.C. § 1391(b) and (c). Denka does business in this District and the chloroprene emissions from its neoprene manufacturing operations are occurring in this District.

NOTICE

20. Pursuant to 42 U.S.C. § 7603, the United States has provided notice of the commencement of this action to, and has consulted with representatives of, the Louisiana Department of Environmental Quality ("Louisiana DEQ") to attempt to confirm the accuracy of the information upon which the United States is basing this action. The United States has provided notice of the commencement of this civil action to the Louisiana DEQ.

PARTIES

21. Plaintiff, the United States of America, is acting by authority of the Attorney General of the United States and through the undersigned attorneys, on behalf of the Administrator of the EPA. Authority to bring this action is vested in the Attorney General of the United States by 42 U.S.C. § 7605, and pursuant to 28 U.S.C. §§ 516 and 519.

22. Denka is a privately owned limited liability company formed under the laws of the State of Delaware, headquartered in LaPlace, Louisiana, and authorized to do business in the State of Louisiana. Denka is a joint venture between majority owner Denka Company Limited and minority owner Mitsui & Co. Ltd., both of which are Japanese companies. Denka is the current owner and operator, as defined by 42 U.S.C. § 7412(a)(9), of the neoprene manufacturing operations at the Facility. At all times relevant to the Complaint, Denka has been a corporate entity and therefore a "person" within the meaning of 42 U.S.C. §§ 7602(e) and 7603.

23. Formed in 2018, DuPont Specialty Products is a privately owned limited liability company that is headquartered in Delaware and maintains its principal place of business in Delaware. At all times relevant to the Complaint, DuPont Specialty Products has been a corporate entity and therefore a "person" within the meaning of 42 U.S.C. §§ 7602(e) and 7603.

24. Subject to a reasonable opportunity for investigation and discovery, DuPont Specialty Products owns the land upon which the Facility is located. Subject to a reasonable opportunity for investigation and discovery, DuPont Specialty Products leases to Denka the land upon which the neoprene manufacturing operations are located. The Ground Lease documents this lessor/lessee relationship. The Ground Lease has an effective date of approximately October 30, 2015 and lasts for a 99-year term.

25. The Ground Lease retains certain rights for DuPont Specialty Products (either directly or as an assignee) that can affect Denka's neoprene manufacturing operations. Under the Ground Lease, DuPont Specialty Products (either directly or as an assignee) retains rights over certain assets at the Facility. These assets include fixtures, improvements, and easements, such as: certain of the well injection pumps, carbon beds, wastewater sampling equipment, tanks, process and service lines, sewer lines, electrical equipment, and rights-of-way on certain roadways. The Ground Lease also requires Denka to obtain DuPont Specialty Products' consent before undertaking certain construction activities or equipment modifications involving the neoprene manufacturing operations.

26. In order for complete relief to be afforded in this matter, the Court may need to involve DuPont Specialty Products. DuPont Specialty Products maintains rights or interests under the Ground Lease and as the owner of the land upon which Denka's neoprene manufacturing operations are located. These rights and interests may be impacted in this matter because the relief that the United States seeks from Denka may, for example, require onsite construction or other work that requires DuPont Specialty Products' consent under the Ground Lease. DuPont Specialty Products is therefore a required party pursuant to Fed. R. Civ. P. 19(a) and the All Writs Act, 28 U.S.C. § 1651.

GENERAL ALLEGATIONS

<u>Denka's Neoprene Manufacturing Operations</u>

27. Neoprene (*a.k.a.* "chloroprene rubber" or "polychloroprene") is a flexible, synthetic rubber used to produce common goods like wetsuits, beverage cozies, orthopedic braces, and automotive belts and hoses. Denka began manufacturing neoprene at the Facility on approximately November 1, 2015. Denka purchased the neoprene manufacturing operations at

the Facility in 2014 from E.I. DuPont de Nemours and Company. E.I. DuPont de Nemours and Company (or a predecessor-in-interest) owned and operated the original neoprene manufacturing operations at the Facility from about 1968 until the sale to Denka.

28. Since about 2008, neoprene has been manufactured at only one place in the United States: the Facility. According to the EPA's Toxic Release Inventory database, Denka's manufacturing operations at the Facility are the sole source of chloroprene emissions in St. John the Baptist Parish, Louisiana.

29. Denka's neoprene manufacturing operations consist primarily of three chemical manufacturing process units: the Chloroprene Unit, the Neoprene Unit, and the HCl Recovery Unit. Each of these three units emits chloroprene as well as other hazardous air pollutants.

30. At all times relevant to the Complaint, chloroprene has been an "air pollutant" within the meaning of 42 U.S.C. § 7602(g). At all times relevant to the Complaint, chloroprene has also been defined as a "hazardous air pollutant" by 42 U.S.C. § 7412(b)(1). The Clean Air Act classifies hazardous air pollutants as substances that, through inhalation or other exposure pathways, present or may present a threat of adverse effects to human health or the environment. *See* 42 U.S.C. § 7412(b)(2).

31. Chloroprene is routinely emitted into the air at various stages of Denka's neoprene manufacturing operations. Chloroprene is emitted through vents from the manufacturing operations that discharge directly to the atmosphere. Chloroprene is emitted when tanks and other process vessels are opened, during both normal operations and maintenance work. Chloroprene is also emitted through more diffuse ("fugitive") sources, like equipment leaks and evaporative emissions from wastewater generated during neoprene manufacturing.

32. For example, Denka uses a series of three open-to-the-air, brick-lined pits (collectively called the "Outside Brine Pit") to treat reactive chloroprene-containing sludge, wastewater, and solid waste material generated by the neoprene manufacturing process. These wastes, which are chemically reactive and volatilize high levels of chloroprene into the air, are skimmed from strainers at the polymerization kettles and poured into open, wheeled bins several times per day. Liquid wastewater is hosed into open grated trenches that eventually empty into the Outside Brine Pit. The wastes are wheeled in the open bins to the Outside Brine Pit. There, employees dump the wastes into the Outside Brine Pit where they are left to finish their chemical reactions. By design, these wastes volatilize chloroprene to the open air before they are collected for off-site disposal.

33. Denka's chloroprene emissions drift beyond the Facility's property line and into the ambient air of the surrounding communities in LaPlace, Reserve, and Edgard, Louisiana. Thousands of people, including children, who live, work, and go to school in these communities breathe that air.

34. Pursuant to a January 6, 2017 Administrative Order on Consent issued by the Louisiana DEQ, Denka agreed to reduce chloroprene emissions from its neoprene manufacturing operations. Denka upgraded equipment and installed emission control devices, including a Regenerative Thermal Oxidizer which became fully operational in March of 2018. These actions reduced the Facility's chloroprene emissions.

35. Despite these emission reductions, Denka continues to emit approximately 18 tons of chloroprene each year. And despite Denka's emission reductions, chloroprene concentrations in the communities surrounding the Facility have averaged between approximately 0.4 and 2.9 $\mu g/m^3$ since April 2018, depending on the monitoring location – all

significantly exceeding 0.2 μg/m^3. Without further emission reductions, Denka's chloroprene emissions will continue to cause average chloroprene levels to exceed 0.2 μg/m^3 in the communities surrounding the Facility.

The Communities Living Near the Facility

36. According to United States census data, between approximately 15,000 to 17,000 people live within two-and-a-half miles of Denka's Facility. Over 20% of that population (roughly 3,000-4,000) is under the age of 18. Of those 3,000-4,000 young people, approximately 800-1,000 are young children under the age of 5.

37. The Fifth Ward Elementary School, which is attended by more than 300 children, is located about half-a-mile from the center of Denka's Facility. Approximately 1,200 students are enrolled at East St. John High School, which is roughly a mile-and-a-half north of Denka's neoprene manufacturing operations.

Chloroprene's Carcinogenic Effects

38. Chloroprene is a likely human carcinogen that acts via a mutagenic mode of action.

39. Infants and children are more susceptible than adults to the cancer risks posed by mutagens like chloroprene. This is because more rapid cell division during early life results in less time for the body to repair DNA mutations before the damaged cells replicate. The more rapid replication of mutated cells increases the risk of developing cancer. Infants and children are also more susceptible to chloroprene's cancer-causing risks because, for physiological reasons, they will likely have higher and more persistent blood concentrations of chloroprene or its metabolites than adults exposed to the same air concentrations of chloroprene.

40. The EPA's Integrated Risk Information System ("IRIS") program identifies and characterizes the health hazards of chemicals found in the environment. The EPA develops IRIS assessments to characterize the risks to human health posed by specific environmental hazards. IRIS assessments are conducted by experts in various scientific disciplines such as toxicology, epidemiology, and pharmacokinetics. Developing an IRIS assessment for a particular chemical involves identifying health hazards associated with human exposure to that chemical, then quantifying the relationship between exposure to the chemical and the related health hazards to arrive at an estimate of cancer potency.

41. In 2010, the EPA IRIS program published its peer-reviewed assessment of chloroprene (the "2010 IRIS Assessment"). In the 2010 IRIS Assessment, the EPA concluded that chloroprene is "likely to be carcinogenic to humans" and determined that it acts through a mutagenic mode of action. The 2010 IRIS Assessment also provided a quantitative estimate of carcinogenic risk from breathing (*a.k.a.* "inhalation exposure") chloroprene. The 2010 IRIS Assessment was based on a comprehensive review of the available evidence on chloroprene toxicity, including animal toxicology data, evidence of chloroprene's mutagenic properties, and human epidemiological data. The 2010 IRIS Assessment was subject to a rigorous review process within the EPA, by other federal agencies and White House offices, and the public. The conclusions of the 2010 IRIS Assessment were subsequently confirmed by an independent external peer review panel.

42. In the 2010 IRIS Assessment, the EPA also quantified the cancer risks associated with long-term chronic inhalation exposure to chloroprene. Breathing is the primary pathway by which people living near the Facility are exposed to chloroprene. The EPA's 2010 IRIS Assessment establishes 0.2 $\mu g/m^3$ as the average concentration of chloroprene that a person may

breathe over a 70-year lifetime without being expected to exceed a 1-in-10,000 risk of contracting chloroprene-linked cancers. 1.2 $\mu g/m^3$ is the average chloroprene concentration a child may regularly breathe from birth to their second birthday without being expected to exceed a 1-in-10,000 lifetime risk of contracting chloroprene related cancers.

Denka Consistently Emits Chloroprene at Levels That Cause Unacceptably High Cancer Risk in the Surrounding Communities

43. The EPA has determined that Denka's chloroprene emissions are presenting an imminent and substantial endangerment because the average chloroprene concentrations in the ambient air near the Facility from the period of April 2018 through January 2023 at Denka's monitoring stations are 2.89, 2.21, 1.26, 1.06 and 0.89 $\mu g/m^3$ for the five closest monitors to the Facility, and 0.41 $\mu g/m^3$ for the monitor located approximately two-and-a-half miles away in Edgard, Louisiana. Even the lowest measured average value for the five closest monitors is more than four times greater than 0.2 $\mu g/m^3$, and the highest average is more than 14 times higher. In the aggregate, the thousands of people breathing this air are incurring a significantly higher cancer risk than would be typically allowed, and they are being exposed to a much greater cancer risk from Denka's air pollution than the majority of United States residents face.

44. In 2016, the EPA and Denka both began monitoring chloroprene concentrations in the air around the Facility. This air monitoring was intended to better understand the amount of chloroprene that people living near the Facility were exposed to and to better characterize the associated health risks.

45. The air monitoring data from both monitoring systems consistently show average airborne chloroprene concentrations in the communities surrounding Denka's neoprene manufacturing operations that are multiples greater than 0.2 $\mu g/m^3$. People living in the

residential area closest to the Facility are currently exposed to average levels of chloroprene that are more than 14 times greater than 0.2 $\mu g/m^3$.

Denka's Air Monitoring Shows Chloroprene Levels that Indicate Excessive Cancer Risk

46. Beginning in August 2016, Denka commenced regular air sampling at several locations near the Facility. Samples are taken roughly once every three to six days, and measure average chloroprene concentrations over a 24-hour period. Denka's monitors are identified as:

a. The "Entergy" monitor, located at or near the Entergy Substation,

b. The "Railroad" monitor, located at or near the intersection of Highway 44 and the Illinois Central Railroad tracks,

c. The "Western" monitor, located at or near the Western Edge of the Facility,

d. The "Levee" monitor, located at or near the Mississippi River Levee on the south side of the Facility,

e. The "Ochsner Hospital" monitor located at or near the Ochsner Hospital, and

f. The "Edgard" monitor, located at or near the St. John the Baptist Parish Courthouse in Edgard.

47. The Western monitor is located near a residential neighborhood that begins only about 50 feet from the Facility's western property line. The Fifth Ward Elementary School is approximately 1,000 feet from the Western monitor. The Railroad monitor is located near a residential area and the closest home sits approximately 500 feet from the monitor. The Levee monitor is located about 2,000 feet from the nearest home. The Edgard monitor is located approximately two-and-a-half miles southwest of the Facility, across the Mississippi River. The Entergy, Ochsner Hospital, and Railroad monitors are respectively located approximately one mile north, northeast, and east of the Facility.

48. Air monitoring data collected at each of Denka's monitoring sites since April 2018 – reflecting air quality after the Regenerative Thermal Oxidizer commenced stable operations – shows that the average chloroprene concentration across all six Denka sampling sites from April 2018 through January 2023 was approximately 1.46 $\mu g/m^3$— more than 7 times higher than 0.2 $\mu g/m^3$. The worst of Denka's sampling locations (the Western monitor, which is closest to the residential neighborhood west of the Facility) showed average concentrations of 2.89 $\mu g/m^3$, more than 14 times higher than 0.2 $\mu g/m^3$. *See* Table 1 below:

Table 1: Denka Air Monitoring Results, April 2018 – January 2023	
Denka Monitoring Site	**Average Monitored Chloroprene Concentration from April 2018 – January 2023**
Western	2.89 $\mu g/m^3$
Levee	2.21 $\mu g/m^3$
Railroad	1.26 $\mu g/m^3$
Ochsner Hospital	1.06 $\mu g/m^3$
Entergy	0.89 $\mu g/m^3$
Edgard	0.41 $\mu g/m^3$
Average Monitored Chloroprene Concentration Across All Denka Monitoring Sites from April 2018 – January 2023	**1.46 $\mu g/m^3$**

49. In January 2022, Denka deployed 18 diffusion tube air monitors – a different type of monitor than the six 24-hour canisters – around the Facility's fenceline. Three additional diffusion tube monitors were installed later that year (for a total of 21 diffusion tube monitors). These new monitors measure the ambient air concentration of chloroprene over a two-week sampling period. Consistent with the results of the EPA's and Denka's 24-hour air sampling, through late December 2022, 19 of 21 diffusion tube sampling locations are measuring average chloroprene concentrations greater than 0.2 $\mu g/m^3$. And two-week average concentrations of chloroprene significantly greater than 0.2 $\mu g/m^3$ continue to occur near residential areas.

EPA's Air Monitoring Showed Chloroprene Levels that Indicate Excessive Cancer Risk

50. From May 2016 through September 2020, the EPA also regularly collected 24-hour air samples from six locations near the Facility. The EPA's monitoring sites, which were near, but not exactly where Denka's monitors are located, were identified as:

a. The "Acorn and Highway 44" monitor, located at or near the intersection of Acorn Street and Highway 44,

b. The "Levee" monitor, located at or near the Mississippi River Levee on the south side of the Facility,

c. The "Fifth Ward Elementary School" monitor, located at or near the Fifth Ward Elementary School,

d. The "Ochsner Hospital" monitor located at or near Ochsner Hospital,

e. The "Chad Baker" monitor, located at or near a residence on Chad Baker Street, and

f. The "East St. John High School" monitor located at or near East St. John High School.

51. Air monitoring data collected at each of the EPA's monitoring sites, starting in April 2018, show that the average chloroprene concentration across all the EPA's sampling sites from April 2018 through September 2020 was 1.43 $\mu g/m^3$—7 times higher than 0.2 $\mu g/m^3$. The worst of EPA's sampling locations (the Chad Baker site, in the residential neighborhood west of the Facility) showed average concentrations of 2.22 $\mu g/m^3$, more than 11 times higher than 0.2 $\mu g/m^3$. *See* Table 2 below:

Table 2: EPA Air Monitoring Results, April 2018 – September 2020	
EPA Monitoring Site	**Average Monitored Chloroprene Concentration from April 2018 – September 2020**
Chad Baker	2.22 $\mu g/m^3$
Levee	1.90 $\mu g/m^3$
Fifth Ward Elementary School	1.73 $\mu g/m^3$
Acorn and Hwy 44	1.17 $\mu g/m^3$
Ochsner Hospital	1.15 $\mu g/m^3$
East St. John High School	0.44 $\mu g/m^3$
Average Monitored Chloroprene Concentration Across All EPA Monitoring Sites from April 2018 – September 2020	**1.43 $\mu g/m^3$**

Infants and Young Children Will Exceed Unacceptable Lifetime Cancer Risk Levels Much More Quickly Than Adults

52. Current chloroprene concentrations near the Facility present a risk that is especially grave for infants and children under the age of 16. For example, infants and children who begin consistently breathing chloroprene starting in infancy at the average concentrations measured near the Western and Chad Baker air monitors (listed in Tables 1 and 2) will surpass their lifetime 1-in-10,000 excess cancer risk within approximately two years after their exposure begins (68 years sooner than the 70-year period over which lifetime excess cancer risks are determined). Adolescents and adults who consistently breathe Denka's current chloroprene emissions will similarly surpass a 1-in-10,000 excess cancer risk in far less time than the 70-year timeframe that the EPA uses to identify "lifetime" cancer risks.

The Cancer Risks from the Facility's Chloroprene Emissions are Cumulative

53. Chloroprene has been released into the environment for decades as a result of neoprene manufacturing operations at the Pontchartrain Works Site. Historical sampling,

emission data, and air modeling show that, before April 2018 and during the decades when the Facility was owned and operated by E.I. DuPont de Nemours and Company (and its predecessors in interest), people living near the Facility were exposed to chloroprene at average concentrations multiples higher than current levels. Until recently, the neoprene manufacturing operations often emitted more than one hundred tons of chloroprene each year.

54. Residents in communities surrounding the Facility have been and continue to be chronically exposed to unacceptably high levels of chloroprene and the consequent cancer risk.

Clean Air Act Section 303

55. Congress enacted the Clean Air Act "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." 42 U.S.C. § 7401(b)(1).

56. Section 303 of the Clean Air Act, 42 U.S.C. § 7603, provides:

> Notwithstanding any other provision of this chapter, the Administrator, upon receipt of evidence that a pollution source or combination of sources (including moving sources) is presenting an imminent and substantial endangerment to public health or welfare, or the environment, may bring suit on behalf of the United States in the appropriate United States district court to immediately restrain any person causing or contributing to the alleged pollution to stop the emission of air pollutants causing or contributing to such pollution or to take such other action as may be necessary.

57. The increased cancer risks to people living near Denka's neoprene manufacturing operations that are being caused by long-term exposure to Denka's chloroprene emissions represent an "endangerment to public health [and] welfare" within the meaning of 42 U.S.C. § 7603. The Clean Air Act explains that effects on welfare include, but are not limited to, harm to "personal comfort and well-being, whether caused by transformation, conversion, or combination with other air pollutants." 42 U.S.C. § 7602(h).

58. The endangerment posed by Denka's chloroprene emissions is "imminent" in that the conditions giving rise to it – the currently measured average concentrations of airborne chloroprene – are present now. The endangerment is also "substantial" given the proximity of the surrounding communities to Denka's chloroprene emissions, the number and age distribution of the exposed population, the magnitude of Denka's current chloroprene emissions and the communities' ongoing exposure to them, and the consequent greater than 1-in-10,000 lifetime excess cancer risk. Based on these circumstances, Denka's current chloroprene emissions represent a serious threat of harm to public health and welfare.

59. The serious threats to public health and welfare caused by Denka's chloroprene emissions will continue until Denka significantly reduces its emissions. Even after Denka's more recent efforts to reduce its chloroprene emissions, chloroprene concentrations in the ambient air around the Facility still average well above 0.2 $\mu g/m^3$. If Denka continues to emit chloroprene at its current levels, chloroprene concentrations in the communities surrounding the Facility will continue to present an imminent and substantial endangerment.

CLAIM FOR RELIEF
(Injunctive Relief under 42 U.S.C. § 7603)

60. Paragraphs 1 through 59 are re-alleged and incorporated herein by reference.

61. At all times relevant to the Complaint, Denka's neoprene manufacturing operations at the Pontchartrain Works Site have been a "pollution source" within the meaning of 42 U.S.C. § 7603. The Chloroprene Unit, Neoprene Unit, and HCl Recovery Unit constitute a "combination of sources" within the meaning of 42 U.S.C. § 7603.

62. Emissions of chloroprene from Denka's neoprene manufacturing operations are "pollution" within the meaning of 42 U.S.C. § 7603.

63. At all times relevant to this Complaint, Denka has caused and continues to cause the observed concentrations of chloroprene in the air in, around, and outside of the Facility's property line at the air monitoring locations listed in Tables 1 and 2.

64. Based on the information described in Paragraphs 3 - 54, the EPA has received evidence that the current concentrations of chloroprene in the air in and around the Facility present an imminent and substantial endangerment to public health or welfare, including but not limited to unacceptably high lifetime excess cancer risks to residents of LaPlace and Reserve, Louisiana.

65. Based on the terms of the Ground Lease, Denka may need permission or cooperation from DuPont Specialty Products in order to take the necessary actions to abate the imminent and substantial endangerment posed by its current chloroprene emissions.

66. Any delay or refusal by DuPont Specialty Products to authorize Denka under the Ground Lease to comply with the requirements of any order of this Court will contribute to the emission of air pollutants within the meaning of 42 U.S.C. §§ 7602(g) and 7603.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff the United States of America respectfully requests that the Court provide the following relief:

1. Order Denka to immediately take all necessary measures to eliminate the imminent and substantial endangerment posed by chloroprene emissions from the Facility;

2. Order Denka to take all other actions as may be necessary to address and mitigate the harm to public health and welfare that Denka's chloroprene emissions have caused;

3. Order DuPont Specialty Products to authorize and not impede, under the terms of the Ground Lease, all construction and other necessary measures for Denka to comply with any order issued by the Court in this matter; and

4. Award Plaintiff such other and further relief as the Court deems just and proper.

Respectfully submitted,

FOR THE UNITED STATES OF AMERICA

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<u>EXHIBIT B</u>

Vandenberg Declaration (DN 9-6), *United States v. Denka Performance Elastomer, LLC, et al.*, No. 23-cv-735 (E.D. La. March 20, 2023)

United States v. Denka Performance Elastomer, LLC et al. (2:23-cv-735)

United States' Motion for Preliminary Injunction

Exhibit D

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF LOUISIANA**

UNITED STATES OF AMERICA, *Plaintiff*, v. DENKA PERFORMANCE ELASTOMER, LLC *and* DUPONT SPECIALTY PRODUCTS USA, LLC, *Defendants*.	Civ. No. 2:23-cv-735

**DECLARATION OF DR. JOHN J. VANDENBERG
IN SUPPORT OF MOTION FOR PRELIMINARY INJUNCTION**

Pursuant to 28 U.S.C. § 1746, I, John J. Vandenberg, declare as follows:

Introduction

1. I have been retained by the U.S. Department of Justice and asked to render my expert opinions on the risk to human health posed by the emissions of chloroprene from the Denka Facility located in La Place, Louisiana (the "Facility" or "Denka Facility").

Qualifications

2. I am an expert in risk assessment with more than 40 years of experience in air quality research, science assessment, human health and environmental risk assessment, and national and state environmental policy. My *curriculum vitae* is Attachment 1. For over 30 years I have been an adjunct professor at the Nicholas School of the Environment, Duke University, where I currently teach air quality-related courses and I previously taught a course on human health and ecological risk assessment. I've also been an Adjunct Professor at Duke-Kunshan University, Kunshan, China for several years.

3. I served for 12 years as Director of the Health and Environmental Effects Assessment Division of the Center for Public Health and Environmental Assessment at the U.S. Environmental Protection Agency (retired, 2021). In this role, I was responsible for leadership, planning, and oversight of the U.S. Environmental Protection Agency (EPA)'s Integrated Science Assessments for the major (criteria) air pollutants and Integrated Risk Information System (IRIS) assessments for high-priority hazardous air pollutants, including chloroprene, and development of new risk assessment methodologies. I served for several years as National Program Director of the EPA's Human Health Risk Assessment program, as National Program Director of the EPA's Particulate Matter Research program, and as Director of the EPA's Research to Improve Health Risk Assessment program. Other positions I held at the EPA include Associate Director for Health at the National Center for Environmental Assessment, Director of the Human Studies Division and Director of the Experimental Toxicology Division at the National Health and Environmental Effects Research Laboratory, and as a health scientist in the EPA Office of Air Quality Planning and Standards. I worked on detail from EPA for one year as a health scientist with the Reproductive and Cancer Hazard Assessment Section of the California Department of Health Services. I testified as the EPA expert to the House Science, Space, and Technology Subcommittee on Environment of the U.S. House of Representatives and the U.S. Senate Environment and Public Works Committee on the health and environmental effects of air pollutants.

4. I have been a consultant to the World Health Organization, the International Agency for Research on Cancer, and the Food and Drug Administration. I also have represented the EPA in numerous scientific meetings in Europe, South America, Asia, and the Middle East. I have served as EPA liaison to the National Academies of Science, Engineering, and Medicine

Board on Environmental Sciences and Toxicology and numerous university and State scientific advisory committees. I am an elected Fellow of the Society for Risk Analysis and a recipient of the EPA's Distinguished Service and Statesmanship Awards. I received my master's and doctorate degrees in biophysical ecology from the Nicholas School of the Environment, Duke University.

Publications in the last 10 years

5. I have been a co-author on eleven papers published in the past ten years. My *curriculum vitae* (Attachment 1) lists those and prior publications on pages 8–13. I have also been involved in the creation of numerous scientific reports used in federal risk assessments including IRIS assessments for many priority pollutants and Integrated Science Assessments for each of the criteria air pollutants.

Prior Testimony

6. I have not testified as an expert at trial or deposition in the past four years.

Compensation

7. I am being compensated for my work on this matter, including testimony, at the rate of $185.00 per hour. As of the date this declaration was signed, I have spent approximately 570 hours on this matter.

Methodology and Facts and Data Considered

8. The Denka Facility is located in LaPlace, Louisiana (with a portion of the Facility also lying in Reserve, Louisiana). Denka manufactures a synthetic rubber called neoprene from a petrochemical called chloroprene (2-chloro-1,3-butadiene). Chloroprene is produced from 1,3-butadiene. Both chloroprene and 1,3-butadiene are volatile organic chemicals and are listed in the Clean Air Act as hazardous air pollutants.

9. At temperatures below 139 degrees Fahrenheit and at normal atmospheric pressure, chloroprene is a liquid. However, it is highly volatile, and in vapor form, the chemical is emitted into the air from various industrial processes and storage facilities at the Denka Facility resulting in airborne concentrations of chloroprene that can be carried by the wind in any direction. The chloroprene emitted by Denka results in chloroprene air concentrations and exposure to the public in all directions surrounding the Facility.

10. Denka purchased the Denka Facility from DuPont in 2015[1]. DuPont carried out similar manufacturing operations – which emitted chloroprene – at the Facility for many years before the sale.

11. Under the Emergency Planning and Community Right-to-Know Act of 1986, companies meeting certain criteria are required to submit annually to the EPA their emissions of certain chemicals. The releases are broken down by whether the chemicals were released to air, water, land, or off-site locations.[2] The information is compiled every year and made publicly available on the internet through the EPA's Toxic Release Inventory (TRI).[3] The EPA provides several of tools for accessing TRI data, including the TRI Toxics Tracker, which is available at https://edap.epa.gov/public/extensions/TRIToxicsTracker_embedded/TRIToxicsTracker_embedded.html. The TRI contains data from thousands of facilities across the country and hundreds of different chemicals. Risk assessment professionals frequently rely on TRI data to screen facilities for potential risks from chemical releases.

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[1] *https://www.prnewswire.com/news-releases/denka-announces-completion-of-acquisition-of-duponts-chloroprene-rubber-business-300172002.html*

[2] Title 42 USC § 11023. *See also* U.S. EPA, Basics of TRI Reporting, available at https://www.epa.gov/toxics-release-inventory-tri-program/basics-tri-reporting,

[3] https://www.epa.gov/toxics-release-inventory-tri-program

12. Information in the TRI can be accessed several ways, including by chemical, by facility, and by geographic location. I accessed TRI data through the EPA's TRI Toxics Tracker, where I found data for chloroprene emissions to the air from Denka, from DuPont (the former owner of the Facility) and from other facilities. I reviewed the air emissions data available for the Facility from Denka and DuPont from 2012 through 2021.

13. According to data in the TRI, the Denka Facility emits to the air over 95% of the chloroprene emitted by all sources in the United States that report to the EPA's Toxic Release Inventory. The Denka Facility is the only source of chloroprene emissions in St. John the Baptist Parish, Louisiana. Formosa Plastics LA, located approximately 50 miles to the northwest of the Denka Facility, emits 4% of the national total.[4]

14. Chloroprene emissions from the Facility reported by Denka and E.I. DuPont de Nemours and Company ("DuPont") to the TRI since 2012 demonstrate tens to hundreds of thousands of pounds of chloroprene have been emitted annually into the air for many years. Attachment 2 shows data that I obtained from the TRI.[5]

15. To assess the public health impacts of Denka's chloroprene air emissions, I and Drs. Cote and Suh used the standard risk assessment framework developed by the National Academies of Science, Engineering, and Medicine for chemical risk assessments conducted by the US federal government: (1) hazard identification, which follows a weight-of-evidence approach to determine whether exposure to chloroprene can result in human cancer; (2) concentration-response assessment[6] to determine how many cancers are estimated to occur at

[4] *ibid.*

[5] https://edap.epa.gov/public/extensions/TRIToxicsTracker/TRIToxicsTracker.html#continue

[6] Called "dose-response assessment" in general use or with oral exposures. "Concentration-response" or "exposure response" are preferred terms when describing inhalation exposures and are used here.

various exposure concentrations; (3) exposure assessment to determine levels of public exposure, e.g., using modeling or ambient air monitoring; and (4) risk characterization to determine the chloroprene cancer risks for the public living, working, and attending school near the Denka Facility and to describe overall confidence in these data.[7] This approach follows guidance on the conduct of risk assessment in the Federal government and guidelines published by the EPA and other risk assessment organizations.[8]

16. In Dr. Cote's declaration, she addresses the first two steps in risk assessment: (1) hazard identification; and (2) concentration-response assessment. I address the next two steps in risk assessment: (3) exposure assessment to determine levels of public exposure using ambient air monitoring; and (4) risk characterization to determine the specific chloroprene cancer risks for the public living, working, and attending school near the Denka Facility and to describe my overall confidence in these data. Additionally, Dr. Helen Suh has reviewed the epidemiological data. I have spoken with Drs. Cote and Suh and reviewed their declarations. I concur with their analyses.

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[7] National Research Council (NRC). 1983. *Risk Assessment in the Federal Government: Managing the Process*. Washington, DC; NRC. 1994. *Science and Judgment in Risk Assessment*. Washington, DC; NRC. 2009. *Science and Decisions: Advancing Risk Assessment*. 978-0-309-12046-3. Washington, DC.

[8] For example: the Agency for Toxic Substances and Disease Registry (ATSDR). 2022. *Public Health Assessment Guidance Manual: Evaluate the Evidence to Examine Cancer Effects.* Atlanta, Georgia; Consumer Product Safety Commission (CPSC). 2022. Hazardous Substances Administration and Enforcement Regulations. *Guidelines for Determining Chronic Toxicity of Products Subject to the FHSA [Federal Hazardous Substances Act]*. 57 Fed. Reg. 197, 46633 (October 9, 1992); US Environmental Protection Agency (EPA). 2005a. *Guidelines for Carcinogen Risk Assessment*. (EPA/630/P-03/001F). Washington, DC; National Institute of Occupational Safety and Health (NIOSH). 2016. *Current Intelligence Bulletin 68: NIOSH Chemical Carcinogen Policy*. Publication No. 2017-100. Cincinnati, OH; World Health Organization (WHO). 2020. *Environmental Health Criteria 240: Principles and Methods for the Risk Assessment of Chemicals in Food*. Geneva, Switzerland.

17. To perform an exposure assessment, I identified and evaluated air monitoring data from the extensive and high-quality EPA and Denka ambient air monitoring programs to calculate average (mean) concentrations of chloroprene for each monitored location. Combining the chloroprene cancer concentration-response information provided by Dr. Cote (which matches the conclusions of the 2010 IRIS Assessment) with the average concentrations of chloroprene at each monitored site, I produced a risk characterization for cancer that results from the emissions of chloroprene from the Denka Facility. The increase in cancer risk from chloroprene exposures over time was also calculated for children and adults for each air monitoring location.

Opinions

18. The following is a statement of my current opinions in this matter. If called to testify, I could competently testify to the following to a reasonable degree of scientific certainty.

I. EPA's IRIS Assessment is scientifically accurate and concludes chloroprene is likely and potent human carcinogen

19. In September 2010, the EPA's IRIS program completed an assessment of chloroprene human health effects. The assessment was called the *Toxicological Review of Chloroprene*[9] but I refer to it as the "2010 IRIS Assessment."

20. In the 2010 IRIS Assessment, which was based on an exhaustive review and analysis of available health studies and toxicological information about chloroprene, EPA concluded that chloroprene is both a potent and a likely human carcinogen, as described in Dr. Cote's declaration.

21. A critical part of any risk assessment is the development of the human cancer potency estimate called the Inhalation Unit Risk (IUR). The IUR is an upper bound excess

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[9] U.S. EPA (2010). *Toxicological Review of Chloroprene (CASRN 126-99-8) in support of summary information on the Integrated Risk Information System (IRIS)*. (EPA/635/R-09/010F). Washington, DC: U.S. Environmental Protection Agency. (EPA_0028252)

lifetime cancer risk estimated to result from continuous exposure to one microgram (μg) of chloroprene in a cubic meter of air (1 $\mu g/m^3$). Mathematically, the IUR is the slope of the concentration-response relationship.

22. Chloroprene is classified as a likely human carcinogen. As Dr. Cote explains, there is sufficient evidence of a mutagenic mode of action. It is well known that infants and children can be more sensitive to the effects of carcinogens compared to adults. Consequently, EPA and other organizations adjust cancer potency estimates for all mutagenic carcinogens to include the greater risks posed by early-life (infancy and childhood) exposures[10,11]. The EPA's guidance on early life exposure to mutagenic carcinogens establishes Age-Dependent Adjustment Factors (ADAFs) for three specific age groups: 10-fold greater for <2 years; 3-fold greater for 2 to <16 years, and no adjustment for 16 years and above. These values are based on a comparison of the adult and early life exposure risks available at the time. The conclusions that chloroprene is: (1) a likely human carcinogen; (2) is mutagenic; and (3) the basis for the ADAFs are described by EPA in the 2010 IRIS Assessment and Dr. Cote's declaration.

23. The IUR for adult-only exposures (i.e., the IUR before ADAFs are applied) for chloroprene is 0.0003 per $\mu g/m^3$ and does not reflect presumed early-life susceptibility. When ADAFs are applied for children less than 2 years old the IUR is 0.003 per $\mu g/m^3$; for children from 2 to <16 years the IUR is 0.0009 per $\mu g/m^3$; and for people from 16 years to 70 years the IUR is 0.0003 per $\mu g/m^3$. Consequently, after taking into account the portion of a life

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[10] ATSDR 2022 *Evaluate the Evidence to Examine Cancer Effects*; EPA 2005b, pp. 30-33; OEHHA 2009, p.1; WHO 2006 p. 115-128.

[11] US Environmental Protection Agency. 2005b. *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens*. EPA/630/R-03/003F. Washington, DC.

represented by each range, the lifetime IUR for individuals exposed to chloroprene continually from birth to 70 years of age IUR for chloroprene of 0.0005 per µg/m^3.

Age range (years)	ADAF	IUR	ADAF-Adjusted IUR	Portion of a 70-year lifespan
0-2	10	0.0003 per µg/m^3	0.003 per µg/m^3	2.9%
2-16	5	0.0003 per µg/m^3	0.0009 per µg/m^3	20%
16-70	1	0.0003 per µg/m^3	0.0003 per µg/m^3	77%
Lifetime (0-70)	N/A	0.0003 per µg/m^3	0.0005 per µg/m^3	100%

24. The risk assessment process, therefore, allows us to calculate the increased cancer risks attributable to any air concentration of chloroprene for different age groups and durations of exposure. Cancer risks for inhaled pollutants are calculated by multiplying the ADAF-adjusted IUR by the concentration of chloroprene in the air that people are exposed to for the duration of exposure and summed across age groups to estimate lifetime cancer risk to a specified amount of a substance. To estimate cancer risks resulting from the Facility's chloroprene emissions, the average air concentrations of chloroprene measured by the EPA and Denka air monitoring programs, described below, are used to estimate lifetime cancer risks.

II. Emissions of chloroprene from the Denka Facility result in very high ambient concentrations of chloroprene

25. To characterize chloroprene concentrations in the air around the Denka Facility, extensive air monitoring networks and data collection efforts have occurred, which are summarized here. The air monitoring networks were intended to better understand the amount of chloroprene that people living near the Facility were exposed to and to characterize the associated health risks. The air monitoring results form the basis for my chloroprene exposure assessment. This extensive air monitoring dataset demonstrates that very high levels of chloroprene extend more than two and a half miles from the center of the Denka Facility.

26. In 2016, the EPA and Denka both began monitoring chloroprene concentrations in the air around the Facility. These "Active" air monitoring programs utilize standard methods to collect samples in vacuum canisters over a 24-hour sampling period that then undergo evacuation and chemical analysis.

27. In May of 2016 through September 2020, the EPA implemented a regular Active air monitoring program that collected ambient air samples for 24-hours every three or six days at six locations surrounding the Facility where the public may be exposed to chloroprene emissions including near residential areas, at a public elementary school and a high school, and at a hospital. To obtain a sample, a technician would set up a vacuum canister to collect a known amount of air using a controlling orifice over a 24-hour period. At the end of the 24-hour period the technician would collect and seal the canister and send it to a laboratory for chemical analysis. In the laboratory the collected air sample was evacuated from the canister and analyzed using standard chemical analysis methods (Gas Chromatographic/Mass Spectrometric analysis) (EPA 2016a; EPA 2016b; EPA 1999). This EPA monitoring program utilized standard methods generally accepted as reliable for Active[12] sample collection and analysis and provides the average concentration in the air over a 24-hour period.

28. The locations of the six EPA Active monitoring sites are shown in Attachment 3. Attachment 3 is an image of the area surrounding the Facility that I exported from Google Earth. The bubbles shown on the photograph were hand-placed by me to show the approximate location of the EPA monitoring sites based on the information that I obtained from EPA[13].

[12] NRC. 1991. *Human Exposure Assessment: Advances and Opportunities*. Washington, D.C. The sample collection uses EPA TO-14A (available at https://www.epa.gov/sites/default/files/2019-11/documents/to-14ar.pdf and the chemical analysis uses EPA TO-15 (EPA_0017397).
[13] EPA_0017525.pdf (EPA sites)

29. The EPA's Active monitoring program used standard methods for sample collection and chemical analysis that included an appropriate quality assurance plan and reporting of results. The well designed and implemented EPA Active ambient air monitoring program provides data sets of high quality resulting in high confidence in the resulting measurements.

30. In 2016, Denka deployed its own Active monitoring program to measure the amount of chloroprene present at the Denka property fenceline near residential areas and an elementary school, at a hospital, and at a location in Edgard, a community southwest of the Facility, where the public could be exposed. Denka's Active monitors collect ambient air samples every three to six days and utilize the same type of equipment and sample analysis methods as for the EPA Active monitors described above, and likewise capture the average chloroprene concentration in the air over a 24-hour period. Denka continues to operate its air monitoring system through the date of this report.

31. The locations of five of the six Denka Active monitoring sites are shown in Attachment 3. Several Denka Active monitors are located very close to where the EPA Active monitors were located, which allows for a good comparison of the data from these proximate monitors. Attachment 3 is an image of the area surrounding the Facility that I exported from Google Earth. The bubbles shown on the photograph were hand-placed by me to show the approximate locations of the Denka Active monitoring sites based on the information that I obtained from Denka[14]. An additional Denka Active monitoring site is located in Edgard, LA, about 2.5 miles to the southwest of the Facility, too distant to show on the Attachment 3 map of monitoring sites.

[14] LDEQ-EDMS document 10232609 (Denka sites); EPA_0017525.pdf (EPA sites)

32. This Denka monitoring program utilized standard methods for sample collection and chemical analysis that included an appropriate quality assurance plan and reporting of results. This well designed and implemented Denka Active ambient air monitoring method provides data sets that are of high quality resulting in high confidence in the resulting measurements.

33. In my professional opinion, the air monitoring data from the EPA and Denka Active air monitoring programs provide extensive, independent, scientifically valid data that is appropriate for estimating public exposure to chloroprene emissions from the Denka Facility. Very similar results were produced by the extensive and independent EPA and Denka Active ambient air monitoring programs during the period of time they were both in operation. The similarity of results underscores the quality of the measurements obtained and the suitability of the results for the assessment of cancer risks from chloroprene exposures.

34. Health risk assessment for environmental exposures to pollutants may be based on various exposure estimators that provide an approximation to actual exposure ranging from poorest to best, as shown in the table below. To assess the cancer risks from chloroprene exposures near the Denka facility assessment I used quantified ambient measurements of chloroprene collected for multiple years in the vicinity of residences and the location of other significant activities (e.g., elementary and high schools, hospital). As is the case for all or nearly all hazardous air pollutants, quantified personal measurements of sufficient scope and duration needed for quantified health risk assessment were not available. The available ambient air monitoring data provide a very strong basis for estimating cancer risks resulting from the Denka emissions of chloroprene to the air.

Exposure Estimators	Approximation to Actual Exposure
Residence or employment in defined geographic area (e.g., county of the emission source/site)	**Poorest** ↓
Residence or employment in geographic area in reasonable proximity to the emission source/site	↓
Distance from emission source/site to location of residence	↓
Distance from emission source/site and duration of residence	↓
Quantified surrogates of exposure (e.g., estimates of drinking water use)	↓
Quantified area or ambient measurements in the vicinity of residence or location of other significant activities	↓
Quantified personal measurements	**Best**

35. The extensive and high-quality Active air monitoring data sets for chloroprene collected by EPA and Denka demonstrate that the public is exposed to high chloroprene levels that extend at least two and a half miles from the Denka Facility.

36. In 2022, Denka deployed a network of 21 additional “Passive” air monitors spaced around the Facility’s fenceline. (Eighteen were installed in January 2022, and three more later that year.) These Passive monitors measure the ambient air concentration of chloroprene for two-week sampling periods using a method based on passive diffusion to a sorbent that is then analyzed for chloroprene. This Denka Passive monitoring program utilized methods for sample collection and chemical analysis that included an appropriate quality assurance plan and reporting of results. The Denka Passive monitors, however, do not include multiple years and, hence, provide a less robust dataset for calculating representative average chloroprene

concentrations. Additionally, the Passive collection method is subject to wind speed, temperature, and humidity variables and there is no evidence the Passive method has been calibrated to the high-quality Active canister method under local conditions[15,16]. Here, results from the Passive samplers can be compared to the results from the Active methods deployed by EPA and Denka. A comparison of the average chloroprene concentration from samples collected over the same period in 2022 by the Passive Denka monitors and by the Active Denka monitors demonstrates significant differences in the average chloroprene air concentration between the two methods. Due to the potential interference of the Passive monitors by environmental conditions, more uncertain results, significant differences in reported average concentration between nearby-located Denka Active and Passive samplers, and the limited duration of Passive sample collection, I judged the data from the Passive monitors were less suitable than data from the EPA Active and Denka Active monitors for the assessment of cancer risks from chloroprene exposures

37. Between 2016 and 2018, before Denka installed new air pollution control equipment to reduce emissions, measured chloroprene levels in the community were even higher than current levels[17]. There was no regular ambient air monitoring data before 2016, but annual chloroprene emissions reported by the former Facility owner, DuPont, were much greater than

[15] Grosse, D. and J. McDernan. *Passive samplers for investigation of air quality: method description, implementation and comparison to alternative sampling methods.* US EPA, Washington, D.C. EPA/600/R-14/434, 2014.

[16] Tolnai, B., A. Gelencsér, C. Gál, and J. Hlavay. 2000. *Evaluation of the reliability of diffusive sampling in environmental monitoring*. Analytica Chimica Acta 408:117–122.

[17] EPA_0027466; *see also* EPA_0019592 at 6 (Sept. 1, 1995, Final Approval, Air Toxics Compliance Plan, DuPont Company Pontchartrain Works, HCL Recovery Unit (DuPont Pontchartrain Works Facility Wide Emissions Summary Table)), and additional Denka submissions.

those seen in more recent years. These higher emissions are indicative of higher population exposures before 2016[18].

38. The EPA and Denka Active air monitoring programs demonstrate that high concentrations of chloroprene are consistently measured in every direction from the Denka Facility where people live, work and attend school. These two monitoring programs were well conducted and operational for varying periods, collecting 24-hour samples every three to six days for several years. The close proximity of monitoring sites to residential and community sites supports the use of their measured concentrations as proxies for chloroprene exposures experienced by the surrounding communities. Two robust data sets about long-term exposure to chloroprene provide a clear picture of exposures and risks around the Facility. This information is further bolstered by other air monitoring conducted near the Denka Facility, including initial "grab" samples taken by the Louisiana Department of Environmental Quality to determine if chloroprene was present near Denka[19] and the samples obtained by the Denka Passive monitoring program.

39. The average chloroprene air concentrations measured at the EPA (until September 2020) and Denka Active monitors are shown in Attachment 4. I created the table shown in Attachment 4 as a summary of data from two sources. The first is data from EPA Active air monitors at various locations near the Denka Facility and the second is data from similar Active air monitoring devices owned and operated by Denka. The location of the air monitors is depicted in Attachment 3 except for the Denka site located in Edgard, LA, about 2.5 miles to the southwest of the Facility (too far to be shown on this map).

[18] https://edap.epa.gov/public/extensions/TRIToxicsTracker/TRIToxicsTracker.html#continue
[19] EPA_0000005

40. I obtained data from the EPA Air Quality System for the EPA Active air monitors in a Microsoft Excel file provided to me by counsel for the United States.[20] The file provided 24-hour average measurement of the concentration of chloroprene taken by each air monitoring device every three or six days from May 24, 2016 through September 25, 2020 (*i.e.,* dates of monitor deployment). The spreadsheet also included codes identifying primary and co-located samples (for quality assurance), qualifier codes and the method detection limit (MDL, ranging from 0.016 to 0.037 μg/m^3)[21] for each sample. I spot-checked field notes and chemical analysis documentation to ensure that the spreadsheet data were correct; no errors were identified. The concentration value and MDL value for each sample date were transferred into a copy of the spreadsheet for analysis. Samples identified as non-detect were replaced by a value of ½ MDL.

41. I obtained the data from the Denka Active air monitors from two sources. First, counsel for the United States provided me with a spreadsheet, Bates No.EPA_0027466, that included some of the data. After that, counsel for the United States provided me with copies of monthly reports from Denka on a regular basis that contained additional data including field notes, chemical analysis documentation and results. I reviewed 11 such reports that cover the time period from March 2022 to January 2023. A typical report was about 130 pages. I spot-checked the field notes and chemical analysis documentation for errors and then manually entered the data on measured chloroprene concentrations from the Denka reports into a copy of the spreadsheet. Very few errors were identified in the Denka reports and the spreadsheet underwent quality assurance reviews to ensure that the spreadsheet data were correct. For the

[20] AQSdata.xlsx (EPA_0045031)

[21] The method detection limit (MDL) is defined as the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results.

purposes of performing calculations with the data, samples identified as non-detect were replaced by a value of ½ MDL.

42. Attachment 12 is a spreadsheet that contains all of the data from the Denka Active air monitors from April 2018 through January 2023. There are two tables in attachment 12. The tables are the same, except that the first table shows samples identified as non-detect with "ND," and the second replaced "ND" with ½ MDL.[22]

43. The data presented in Attachment 4 begin in April 2018, when Denka began operating a Regenerative Thermal Oxidizer (RTO) emissions control system. The average concentrations measured at all EPA Active monitoring sites are at or above 1.1 µg/m^3 except for the East St. John High School located about 1.6 miles away from Denka, where the average chloroprene concentration of 0.44 µg/m^3 was measured. The Chad Baker site located in a neighborhood directly west of the Facility has the highest concentration measured by the EPA Active monitors, averaging 2.22 µg/m^3. The average concentrations measured from April 2018 to the date of this report at the Denka Active monitors located near the Facility fenceline range from 0.89 µg/m^3 to 2.89 µg/m^3 with the highest average concentration measured at the Western site located near a neighborhood and elementary school to the southwest of the Facility. The Edgard site located over 2 miles from the Facility has an average measurement of 0.41 µg/m^3, indicating that widespread exposures above 0.2 µg/m^3 are occurring in the communities surrounding the Facility[23]. Because average levels of chloroprene exceed 0.2 µg/m^3 at the Edgard monitoring site, and high concentrations are measured in all directions from the Denka

[22] For each of Denka's Active samples, the MDL was 0.2 µg/m^3 and the ½ the MDL is 0.1 µg/m^3.

[23] Exposures above 0.2 µg/m^3 are noted because lifetime exposure to this concentration yields a cancer risk above 1-in-10,000, as discussed below.

site, we expect that exposures exceeding 0.2 μg/m^3 extend beyond two and a half miles in all directions from Denka.

44. The results of the EPA and Denka Active monitoring programs are shown graphically in Attachments 5 and 6, respectively. I created these charts from the Active monitoring data described above using Microsoft Excel and PowerPoint. In these Attachments, each blue bar represents the average, or mean, concentration for one monitoring site. The monitoring sites are identified at the bottom of the charts. The average concentration at each site is shown by the height of the bar in a scale of micrograms of chloroprene per cubic meter of air (μg/m^3), shown along the vertical (Y)-axis. There are two dotted lines in each chart. The lower dotted line shows a concentration of 0.2 μg/m^3, which corresponds to a one-in-10,000 increase in the lifetime risk of cancer. The higher dotted line shows a concentration of 2.0 μg/m^3 (ten times as high), which corresponds to a one-in-1,000 increase in the lifetime risk of cancer (also ten times as high).

45. Several of the EPA monitoring sites are relatively close to Denka monitoring sites (*see* attachment 3) and have similar results: (1) the Chad Baker, 5th Ward Elementary School, and Western sites west-southwest of the Facility—located near populated residential areas—show similar average concentrations; (2) the EPA and Denka Levee sites directly south of Denka show similar average concentrations; and (3) and the EPA and Denka Hospital sites, the EPA Acorn and Hwy 44 sites, and Denka Railroad site are to the east-northeast of Denka and show similar average concentrations. The other monitors are to the north and northwest or are over 2 miles to the southwest of the Denka Facility.

46. Denka deployed Passive monitors around the Facility to collect ambient air samples over a series of 2-week sampling periods from January 7 through December 22, 2022.

These Passive monitors provide a longer-term average concentration that results from varying Denka emissions and meteorology over 2-week periods, although there is less confidence in the results as described above.

47. I obtained the data from the Denka Passive air monitors from two sources. I received an Excel spreadsheet summary of Passive monitoring data collected from January through mid-April 2022[24] and then copies of monthly reports from Denka on a regular basis that contained additional data including field notes, chemical analysis documentation and results including chloroprene concentration values. I spot-checked the field notes and chemical analysis documentation for errors and then manually entered the data on measured chloroprene concentrations from the Denka reports into a copy of the spreadsheet. Very few errors were identified in the Denka reports and the manual spreadsheet underwent quality assurance reviews to ensure that the spreadsheet data were correct. The data files provided by Denka include the limit of quantitation[25] (LOQ; reported as 0.18 $\mu g/m^3$) and the limit of detection (LOD; equal to ½ the LOQ *i.e.,* 0.09 $\mu g/m^3$). Samples reported as non-detect were replaced by a value of ½ LOD.

48. Attachment 7 graphically depicts the concentration data from the 21 Denka Passive monitors. I created Attachment 7 from the data provided by Denka using Microsoft Excel and PowerPoint. In the chart, each blue bar represents the average, or mean, concentration for one monitoring site, shown by the height of the bar in a scale of micrograms of chloroprene per cubic meter of air ($\mu g/m^3$), shown along the vertical (Y)-axis. There are two dotted lines in the chart. The lower dotted line shows a concentration of 0.2 $\mu g/m^3$, which corresponds to a one-in-10,000 increase in the lifetime risk of cancer. The higher dotted line shows a concentration of

[24] EPA_0030810.xlsx

[25] The Denka contractor reported that the limit of quantitation (LOQ) meets or exceeds reporting at the 99% confidence level defined in EPA guidance documents for Method 325B.

2.0 μg/m^3 (ten times as high), which corresponds to a one-in-1,000 increase in the lifetime risk of cancer (also ten times as high). The red stars, which I added to the chart, show the passive monitors that are closest to residential areas.

49. The average concentrations measured at the 21 Passive monitor sites, are generally lower than the concentrations measured at the Denka Active monitor sites, but all still equal or exceed 0.2 μg/m^3 (Attachment 7). The average chloroprene concentrations at the Passive monitors closest to the 5th Ward Elementary school and the residential areas surrounding Denka range from 0.6 to 0.9 μg/m^3 (monitors 1, 9, 10, 16 through 20 are the closest monitors to residential areas and denoted with red stars in Attachment 7). The average chloroprene concentrations at the Passive monitors along the road bordering the southern edge of the Denka Facility (monitors 11 through 15 and 21) range from about 0.5 to 2.0 μg/m^3. The average chloroprene concentrations measured at the other Denka Passive monitors range from about 0.2 to 0.7 μg/m^3.

50. The levels of chloroprene measured by the Passive monitors are highly variable, notably at the sites to the west and southwest of the Denka Facility near residential areas. Concentrations measured from sites 1 and 2 collected during the 2-week period from April 14–28, 2022 are more than 25 times greater than the concentrations measured the weeks just before, *i.e.,* March 31-April 14, 2022, and the average concentration measured across the 21 sites from September 15-29, 2022 are more than 10 times greater than the average concentration across the 21 sites from the weeks just before, *i.e.*, September 1-15, 2022. This variability is suggestive of operational events at the Facility resulting in significant changes in emissions and exposures and varying weather conditions. Subsequently, the concentrations of chloroprene decline but many

sites remain elevated above 0.2 μg/m^3. These data illustrate that high levels of chloroprene in the air near residential areas can occur for extended periods of time.

51. The EPA is conducting another ambient air monitoring program (referred to as "SPods"), which began in March 2020. The SPods are located at the same locations as the EPA 3- and 6-day Active monitoring program. The primary purpose of the SPods monitoring program is to identify the magnitude and frequency of emissions excursions (*i.e.,* emission "spikes") to determine what operations were underway at the Denka facility that may have caused the levels exceeding a trigger concentration. The concentration of total Volatile Organic Compounds (VOC) that trigger a sample varied over time and was approximately 100 ppbv total VOC as isobutylene. The equivalent instantaneous chloroprene measurement is around 470 μg/m^3. Once a monitor was triggered, a 24-hour sample is collected. Because the SPod monitors did not collect a routinely scheduled sample, an average chloroprene concentration needed for cancer risk estimation is not available from these monitors. In addition, VOCs other than chloroprene trigger a sample collection. Therefore, data from the SPods were not used in the estimation of cancer risks from the Denka emissions of chloroprene.

52. To best characterize current and anticipated future chloroprene air concentrations, my analysis focuses on the air monitoring data collected after Denka installed the RTO. The RTO began steady state operations in March 2018[26]. Air monitoring results from the Active monitors show a decline in chloroprene air concentrations after April 2018. It is important to note that people who lived in the community before the RTO became operational were exposed

[26] The RTO was installed as an emission control project that Denka undertook pursuant to a January 2017 Administrative Order on Consent with the Louisiana Department of Environmental Quality.

to far higher levels of chloroprene, including during the decades that DuPont owned and operated the Facility.

53. In summary, it is my opinion that the data provided by the EPA and Denka Active air monitoring programs demonstrate that people living in every direction around the Denka Facility are exposed to high average levels of chloroprene, above 0.2 $\mu g/m^3$, and residential areas to the west of Denka have very high average levels well above 2 $\mu g/m^3$. The results from the monitoring programs can be used with high confidence to estimate the public health risks from Denka chloroprene emissions. This judgment is based on the fact that the two independent, well-conducted, and high-quality Active air monitoring programs used appropriate measurement methods to obtain concentrations of airborne chloroprene for several years at relevant locations, including residential areas, out to more than two and a half miles from Denka.

III. People living near the Denka Facility face highly elevated environmental cancer risks

54. Recognition that chemical releases from industrial facilities may present significant risks to public health increased in the 1980s following the deaths or injuries of thousands of people from a 1984 chemical release in Bhopal, India, and the implementation of the Emergency Planning and Community Right-to-Know Act of 1986 which required industries to report their emissions of hazardous air pollutants in the United States[27]. Subsequently, in 1989, the EPA published the policy for setting emissions standards for hazardous air pollutants that focused on managing cancer risks that are greater than 1-in-1 million. "EPA strives to provide maximum feasible protection against risks to health from hazardous air pollutants by: 1) protecting the greatest number of persons possible to an individual lifetime risk level no higher

[27] www.epa.gov/epcra

than approximately 1-in-1 million, and 2) limiting to no higher than approximately 1-in-10,000 the estimated risk that a person living near a plant would have if he or she were exposed to the maximum pollutant concentrations for 70 years"[28]. Congress endorsed this policy in the 1990 amendments to the Clean Air Act[29]. Other EPA programs (e.g., Superfund) and other U.S. federal agencies (*e.g.*, the Department of Defense and the National Institute of Occupational Safety and Health) also apply this presumptive risk management limit. [*See* Attachment 8.]

55. Some of the documents that discuss cancer risk use different expressions to describe the same level of risk. For example, a 1-in-10,000 risk could be express as a 1.0×10^{-4} risk, or a 100-in-1,000,000 risk. In this table, each column represents a risk level, and the rows within each column show different ways of expressing the same level of risk.

1-in-1,000 risk is equivalent to:	1-in-10,000 risk is equivalent to:	1-in-1,000,000 risk is equivalent to:
1.0×10^{-3}	1.0×10^{-4}	1.0×10^{-6}
1 in 1,000	0.1 in 1,000	0.001 in 1,000
10 in 10,000	1 in 10,000	0.01 in 10,000
100 in 100,000	10 in 100,000	0.1 in 10,000
1,000 in 1,000,000	100 in 1,000,000	1 in 1,000,000

56. As described by Dr. Cote in her declaration, and in paragraphs 22-24 above, lifetime cancer risks for inhaled pollutants are calculated by multiplying the ADAF-adjusted Inhalation Unit Risk (IUR) by the estimated average exposure to a substance and summing the risk across a lifetime. I used that method to estimate the excess lifetime cancer risk from exposure to chloroprene at the average levels found at the locations of the Active air monitors. This methodology assumes that exposure to chloroprene at current average levels begins at birth

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[28] 54 Fed. Reg. 38044 (Sept. 14, 1989).
[29] 42 U.S.C. § 7412(f)(2)(B).

and continues for 70 years. This process is consistent with the generally accepted methodology for cancer risk assessment (EPA cancer guidelines, 2005).

57. Assuming lifetime exposure to chloroprene at current average levels, the most exposed individuals—those located closest to the Denka Facility, where chloroprene concentrations are highest—will face a higher than 1-in-1,000 increased cancer risk attributable to chloroprene. Attachment 9 is a table that I created to summarize the increase in lifetime cancer risk for a person exposed to chloroprene at concentrations present at different locations near the Denka Facility. The left column of Attachment 9 shows different locations at which the EPA and Denka Active air monitors are or were located. Locations that were part of Denka's Active air monitoring program are shown in parentheses. The distance from the monitoring site to the approximate center of the Denka emissions location is shown in the right column. The middle column contains numbers that I calculated for each identified location by multiplying the lifetime IUR of 5.0 (5-in-10,000 per $\mu g/m^3$) by the average chloroprene concentration at the location. Increased cancer risk above 1-in-10,000 extends to areas at least two and a half miles from the Denka Facility. These risks are higher than the EPA's presumptive upper limit for acceptable cancer risks of 1-in-10,000. In the case of those closest to the Facility, this limit is exceeded by more than an order of magnitude (risks above 1-in-1,000).

58. People who have been living near the Denka Facility since before 2018 have been exposed to even higher average concentrations of chloroprene than current average levels and are consequently at higher risks than what is presented solely by the post-March 2018 measured average chloroprene concentrations.

59. Very high cancer risks—-exceeding 1-in-1,000—occur in residential neighborhoods immediately west and southwest of the Denka Facility. In 2016, I personally

visited the neighborhoods near Denka's Facility. The Chad Baker Active monitoring site and the Western Active monitoring site located near the Facility demonstrate high average concentrations that result in lifetime cancer risks that exceed 1-in-1,000. The Fifth Ward Elementary School is in a neighborhood between the Chad Baker and Western sites and the average chloroprene concentrations measured there correspond to lifetime cancer risks that are almost an order of magnitude higher than the EPA's presumptive 1-in-10,000 upper limit. Cancer risks exceeding 1-in-10,000 extend to at least a two-and-a-half-mile radius from the Facility. Approximately 16,000 people live within 2.5 miles of the Denka Facility, about a quarter of whom are children (0 to 17 years of age)[30].

60. The estimated lifetime cancer risks from chloroprene concentrations detected in the air at the Active monitoring sites range from 2 to 14 per 10,000 people as shown in Attachment 9.[31]

61. These results are for current conditions, *i.e.,* the monitoring period after the RTO began operation in April 2018, and do not reflect heightened risks for long-term residents, including during the period from November 2015 when Denka purchased the Facility from DuPont until March 2018 when the RTO began stable operations, and during DuPont's many years of higher chloroprene emissions during the time it owned and operated the Facility.

62. As shown in Attachment 9, for example, individuals exposed to a lifetime of the chloroprene levels at Denka's Active monitor measured at the Western site have a 14-in-10,000 lifetime cancer risk (or a 1.4-in-1,000). The long-term average chloroprene level at that location is 2.89 $\mu g/m^3$. However, daily measurements at that location have been as high as 118 $\mu g/m^3$

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[30] Decl. of Dr. Nyesha Black

[31] Numbers rounded to the nearest integer.

(Oct. 10, 2022), and the long-term average for the most recent 12 months for which data is available (2/1/22-1/30/23) is 3.58 μg/m^3.

63. Looking only at data after March of 2018, cancer risks remain high at every site where active monitoring occurred, significantly greater than the 1-in-10,000 risk level that is generally regarded as the upper limit for acceptable risk by the EPA and other U.S. federal agencies. *See* Attachment 8.

IV. Infants and children are more at risk than adults and children living at residences near Denka accrue unacceptable risks in early childhood

64. Infants and children are considerably more susceptible to the effects of carcinogens like chloroprene than adults. Risks from the same concentration of chloroprene exposure accrue much more quickly in the young compared to adult-only exposures. Consequently, children's cancer risks are higher both in early life and over a lifetime of exposure. Based on evidence from other chemicals and the National Toxicology Program (NTP) chloroprene studies, tumors also would be expected to occur at an earlier point in life for those exposed in childhood, although not necessarily in childhood. [32, 33, 34] Dr. Cote's declaration describes the latency period for many cancers.

65. Attachments 10 and 11 shows how excess cancer risks accrue over time, from birth to 70 years, at the concentrations found at various locations around the Denka Facility. Specifically, Attachment 10 shows how excess cancer risks accrue based on the average of

[32] National Toxicology Program (NTP) 1998. *Toxicology and Carcinogenesis Studies of Chloroprene (CAS No 126-99-8) in F344/N Rats and B6C3F1 Mice (Inhalation Studies)*. NIH 98-3957; NTP TR 467. Research Triangle Park, NC:US Department of Health and Human Services, Public Health Service.

[33] Howard, J. 2015. 9.*11 Monitoring and Treatment: Minimum Latency & Types or Categories of Cancer*. https://www.cdc.gov/wtc/pdfs/policies/WTCHP-Minimum-Cancer-Latency-PP-01062015-508.pdf

[34] EPA (2005)

chloroprene concentrations measured from April 2018 through September 2020 at the locations of the Active monitors operated by the EPA. Attachment 11 also shows how excess cancer risks accrue, based on the average of chloroprene concentrations measured from April 2018 through January 2023 at the locations of the Active monitors operated by Denka. Attachments 10 and 11 are charts that I created using Microsoft Excel and PowerPoint. Using Microsoft Excel, I calculated the cancer risk level at ages 2, 16, and 70 by (a) multiplying the ADAF-adjusted IURs (see paragraph 23 above) by: (i) the portion of a 70-year lifespan represented by the age range, and (ii) the average concentration of chloroprene at each Active air monitor location, and then (b) adding in any cancer risk that would have accrued during earlier years lived at that location. In Attachments 10 and 11, the vertical axis shows lifetime cancer risk and the horizontal axis shows age in years. The solid or dashed lines in the chart area show how excess cancer risk would accrue for a person born at the locations identified on the right side of the chart and remaining there for a lifetime of 70 years at the concentrations shown. Attachments 10 and 11 show a very steep rise in lifetime cancer risks for children from birth until their second birthday when exposed to chloroprene. An infant born into a home near the Western Active monitor would accrue an excess cancer risk of nearly 3-in-10,000 by their second birthday. The accrual of lifetime cancer risk is not quite as rapid for children from age 2 until their 16th birthday, as shown by the less steep slope of the line for this age group. If that two-year-old continues to live near the Western Active monitor until the age of 16, he or she would accrue *additional* excess cancer risk of over 5-in-10,000 in that 14-year period, for a total of nearly 8-in-10,000 risk by their 16th birthday. The steepness of the line from birth to age 2, and from age 2 to age 16, is a result of the application of Age Dependent Adjustment Factors due to the increased susceptibility of early life stages to cancer. From age 16 through adulthood the rate of risk accrual occurs at an adult rate. At every Active monitoring site operated by EPA and Denka except Edgard—the site farthest from the Facility and the only one more than two miles away—the 1-in-10,000 risk level is reached within a few years for the youngest children.

66. As noted in Dr. Cote's declaration, cancer does not appear immediately after it starts but takes time to develop (called latency). DNA-damaged cells are reproducing, changing, and expanding in number; this process generally accelerates with time. It is not until this process has gone on for some time, typically years, that cancer becomes clinically evident and is diagnosed. Cancer latency generally is between 2.2 and 57 years depending on the chemical, tumor, and exposure types; however, certain childhood cancers are seen within 0.4–10 years. One of the differences between adult and childhood cancers is that childhood cancers have a shorter latency. Onset varies substantially among individuals. Higher exposure often produces tumors earlier as seen in the NTP chloroprene study.[35] The full impact of early-life exposures will not be seen for years into the future.[36]

V. Current emissions from the Denka Facility present an unacceptable risk to public health from chloroprene exposures

67. Lifetime cancer risk to those living closest to Denka exceeds 1-in-1,000. Risks above 1-in-10,000 extend at least two and a half miles from the Denka Facility. These cancer risks pose an immediate and serious threat to public health. My primary conclusions are:

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[35] Melnick RL, Sills RC, Portier CJ, Roycroft JH, et al. 1999. *Multiple Organ Carcinogenicity of Inhaled Chloroprene (2-Chloro-1,3-Butadiene) in F344/N Rats and B6C3F1 Mice and Comparison of Dose-Response with Butadiene in Mich.* Carcinogenesis 20:867; NTP 1998, *op. cit.*

[36] Howard J. 2015. *9.11 Monitoring and Treatment: Minimum Latency & Types or Categories of Cancer*. https://www.cdc.gov/wtc/pdfs/policies/WTCHP-Minimum-Cancer-Latency-PP-01062015-508.pdf

a. Accurate and reliable active ambient air monitoring from locations at and near where people currently live and the scientifically sound EPA 2010 IRIS Assessment provide a solid basis for understanding and assessing the human cancer risks from Denka's chloroprene emissions.

b. People who live, work, and go to school near the Denka Facility have been, are currently being, and will continue to be exposed to Denka's chloroprene emissions via an inhalation exposure route (*i.e.*, breathing).

c. Denka's current chloroprene emissions result in risks of developing cancer in individuals of all ages in the communities near the Denka Facility. The average monitored chloroprene concentrations at each Active monitoring station (ranging from 0.4 to 2.9 $\mu g/m^3$) all far exceed 0.2 $\mu g/m^3$ (the concentration equating to the 1-in-10,000 presumptive upper limit for acceptable lifetime cancer risk). Lifetime cancer risks to the most exposed individuals—those located closest to the Denka Facility—exceed 1-in-1,000. Those risks are generally regarded as unacceptable by regulatory agencies. (See paragraph 59 and attachment 8).

d. Children are much more susceptible to carcinogens like chloroprene than adults. A child born in 2018, who lived continuously near the Chad Baker monitor accrued an estimated excess lifetime cancer risk that is double the EPA's generally acceptable level of 1-in-10,000 by the time the child reached 2 years of age. That risk continues to increase as their exposure to chloroprene continues. If Denka is not compelled to reduce chloroprene emissions, the excess lifetime cancer risk for children continuously exposed to chloroprene levels like those at the Chad Baker monitoring site are estimated, by age 16, to be 5 to 6 times the EPA's generally acceptable excess cancer risk level. Further, lifetime exposure to such chloroprene levels is estimated to exceed a 1-in-1,000 cancer risk level. Moving to a location free of chloroprene emissions will not eliminate the risk already accumulated.

68. Even higher chloroprene levels than reported here occurred in the past (based on substantially higher historic chloroprene emissions in the area during DuPont's ownership and Denka's first two years of ownership); consequently, the public residing nearby face higher cancer risks attributable to chloroprene than are estimated here.

69. The unacceptable risk levels described here are based on current emissions projected into the future. Current emission levels will continue unless Denka reduces its emissions. These current conditions alone (*i.e.*, not considering the cancer risks stemming from the historically higher ambient chloroprene concentrations measured near Denka before April 2018) present risks to public health, especially to children, from chloroprene exposures that are generally regarded as unacceptable to toxicologists and other scientists working in the area of risk assessment. Reducing chloroprene emissions to bring levels in the community below 0.2 $\mu g/m^3$ would reduce lifetime increased cancer risks for newly exposed individuals to below 1-in-10,000 going forward. But people who live in the community now – and especially those who lived in the community before 2018, when chloroprene emissions from the Denka Facility were even higher – have accumulated cancer risks that will not immediately abate even if exposure reductions are achieved.

70. Chloroprene levels arising from the Denka Facility must be substantially reduced, to below a long-term average of 0.2 $\mu g/m^3$, to bring excess cancer risk levels for those exposed over a lifetime to below 1-in-10,000.

I declare under penalty of perjury that the foregoing is true and correct. Executed on March 7, 2023.

Executed on: March 7, 2023

John J. Vandenberg

Attachment 1

CURRICULUM VITAE

JOHN JAY VANDENBERG, M.S., PhD

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Tel: [redacted]
https://orcid.org/0000-0003-2619-9460

Director, Health and Environmental Effects Assessment Division (2019-2021)
Center for Public Health and Environmental Assessment

Director, Research Triangle Park Division (2008 - 2019)
National Center for Environmental Assessment
Office of Research and Development
US Environmental Protection Agency, Research Triangle Park, NC USA 27711

Responsible for: planning, directing, organizing, coordinating, and communicating human health and environmental research; and hazard, exposure, and risk assessments. Accountable for all aspects of human health and environmental research and assessments used in environmental policy making for U.S. EPA's Health and Environmental Effects Assessment Division. Accountable for overall goals, program plans, operating policies and procedures, personnel, budget and line management responsibilities and evaluating progress and providing direction to an exceptionally diverse staff of approximately 100 federal employees, fellows, students, and senior science advisors. Examples include: Integrated Science Assessments for the major air pollutants including ozone, particulate matter, lead (Pb), oxides of sulfur and oxides of nitrogen; Integrated Risk Information System assessments for hazardous pollutants including chloroprene; Biofuels Report to Congress; and development of new methodologies and models used in risk assessments and publishing original research.

Represented the EPA before the Clean Air Scientific Advisory Committee and other committees of the EPA's Science Advisory Board, the National Academy of Sciences, Engineering and Medicine, and to the U.S. Senate and House of Representatives (designated by the Administrator or Assistant Administrator), and at conferences and meetings of national and international significance.

Adjunct Professor (2000- present) or **Adjunct Assistant Professor** (1992-2000)
Nicholas School of the Environment, Duke University, Durham, NC 27708

Responsible for developing and teaching annually a 3-hour graduate-level Air Quality Management course (ENV 235/535, 1992- 2014); (ENV 603, 2016-2029; ENV 603/604, 2021; ENV 605, 2022 -) to 15-32 students and graduate student advising. Responsible for developing and co-teaching a 3-hour semester long graduate-level Human Health and Ecological Risk Assessment course (ENV 239) annually to 35-40 students (1996-1999).

Adjunct Professor (2017- present)
Duke-Kunshan University, Kunshan, China.

Secretaries' Science Advisory Board Member (2017 - present)
North Carolina Secretaries' Science Advisory Board
North Carolina Department of Environmental Quality and Department of Health and Human Services.

Responsible for advising DEQ and DHHS on health risk assessment of priority environmental contaminants, identifying contaminants of emerging concern, and recommendations for establishing contaminant standards, among other duties.

Air Toxics Science Advisory Board Member (2022 - present)
Oregon Department of Environmental Quality and Oregon Health Authority

Responsible for advising DEQ and OHA on scientific data and methods to protecting community health through evaluation of reference values for use by State programs, among other duties.

National Program Director, Human Health Risk Assessment Program (2013 – 2017)
National Center for Environmental Assessment
Office of Research and Development
US Environmental Protection Agency, Research Triangle Park, NC USA 27711

Responsible for: oversight of strategic planning and budgeting for the exceptionally high visibility Integrated Science Assessments and Integrated Risk Information System (IRIS) programs that supports EPA's air, water, toxics, waste management and regional programs and the Provisional Peer-Reviewed Toxicity Value program that supports the Office of Land and Emergency Management. Additionally, developed new approaches to hazard identification, dose-response assessment, and science information management; conducted international and domestic risk assessment training; supplied emergency community support in response to accidents; (e.g., MCHM water contamination in Charleston, WV) provided scientific leadership for the HHRA research program portfolio; and served as the research needs liaison among EPA's Office of Research and Development, EPA's Program and Regional Offices, the scientific community, and external stakeholders.

Associate Director for Health (2003 - 2008)
National Center for Environmental Assessment
Office of Research and Development
US Environmental Protection Agency, Washington, DC, USA

Responsible for scientific leadership of EPA's comprehensive health risk assessment program; this program improves risk assessment methods and assessment products utilized by EPA regulatory programs, Regions, state and local agencies, industry and public health organizations. Led program development, including creating long and short-term goals to meet the mission-oriented assessment needs of the EPA in the areas of air, drinking water, pesticides, toxic substances, and endocrine disruption. This program also improved the effective utilization of scientific information in health risk assessment. Responsible for all IRIS draft and final products from 2003-2008. Closely coordinated with critical partners, including other laboratories and centers in EPA's Office of Research and Development, client regulatory program offices, and other Federal agencies. Represented EPA's National Center for Environmental Assessment on various senior-level committees and workgroups and presented the program to EPA and non-EPA audiences, including White House managers and staff and international organizations. Responsible for technical and science-policy integrity of all health-related work products of approximately 140 EPA scientists and support staff. Exercised personnel and line management responsibilities over a team of about 26 FTE, including the Integrated Risk Information System staff and two Special Assistants.

Director (Acting), Human Studies Division (2002 - 2003)
National Health and Environmental Effects Research Laboratory
Office of Research and Development
US Environmental Protection Agency, Research Triangle Park, NC 27711 USA

Responsible for scientific and managerial leadership of a comprehensive health research program utilizing clinical research, epidemiology, and *in vitro* approaches to describe and understand the role of environmental agents on public health. Led program development to meet the mission-oriented research needs of the EPA to improve health risk assessment science in the areas of air pollution, drinking water, pesticides and toxic substances, and endocrine disruption. Closely coordinated with critical partners, including other divisions in EPA's Office of Research and Development, client regulatory program offices, and other Federal agencies and organizations. Represented the organization on various senior-level committees and workgroups and presented the program to EPA and non-EPA audiences. Developed and managed a budget above $10 million and related human resources. Assured the scientific and technical integrity of all work products. Exercised personnel management responsibilities over subordinate managers and other staff members (78 federal FTE, students, and post-doctoral fellows). Responsible for assuring that research involving human subjects and communities met the highest ethical standards. Represented the EPA in collaboration with the onsite University of North Carolina Center for Environmental Medicine, Asthma, and Lung Biology.

Director (Acting), Experimental Toxicology Division (2001 - 2002)
National Health and Environmental Effects Research Laboratory (MD-66)
Office of Research and Development
US Environmental Protection Agency, Research Triangle Park, NC 27711 USA

Responsible for scientific and managerial leadership of a comprehensive health research program encompassing pulmonary toxicology, immunotoxicology, and pharmacokinetics. Focused on understanding and describing the fate, disposition, and health consequences of chemicals in the body and ultimately developing quantitative models for extrapolation/prediction in the context of the Agency's risk assessment activities. Led program development to meet the mission-oriented experimental toxicology research needs of the EPA in air pollution, drinking water, pesticides and toxic substances, and endocrine disruption and improve the scientific basis for health risk assessment. Closely coordinated with key partners, including other divisions in the EPA's Office of Research and Development, regulatory program offices, and other Federal agencies. Represented the organization on various senior-level committees and workgroups and presented the program to EPA and non-EPA audiences. Developed and managed a budget above $10 million and related human resources and assured all work product quality. Exercised management responsibilities over subordinate managers and other staff members (104 federal FTE, students and post-doctoral fellows.)

National Research Program Director for Particulate Matter (1999- 2001)
National Health and Environmental Effects Research Laboratory
Office of Research and Development
US Environmental Protection Agency, Research Triangle Park, NC 27711 USA

Responsible for strategic planning and implementation of EPA's $65 million, 200 FTE program of research to improve the scientific basis for regulation of airborne particulate matter. Responsible for providing leadership and coordinating research among multidisciplinary research laboratories, and communicating plans and activities with external organizations, including Congress, the National Research Council, other federal agencies, and several independent scientific and management review committees. Charged with identifying emerging issues, developing new initiatives, and providing leadership in developing new approaches for addressing research priorities for particulate matter. Provides technical consultation on particulate matter research to EPA, State and international groups.

Assistant Director for Air Research (1996-2000)
National Health and Environmental Effects Research Laboratory

Office of Research and Development
US Environmental Protection Agency, Research Triangle Park, NC 27711 USA

Responsible for scientific leadership and strategic planning of research to improve the scientific basis for human health and ecological risk assessment of air pollutants, including particulate matter, hazardous air pollutants, and tropospheric ozone. Working as part of a multi-laboratory planning team, was responsible for coordinating nearly $90 million of research efforts among multidisciplinary research divisions and communicating and coordinating research with external organizations. Charged with identifying emerging issues, developing new initiatives, and providing leadership in developing new approaches for addressing air quality problems. Technical consultation on air quality issues and risk assessment to EPA, State, and international groups.

Associate Director for Multimedia Research (1993-1996)
Health Effects Research Laboratory
Office of Research and Development
US Environmental Protection Agency, Research Triangle Park, NC 27711 USA
Supervisor: Dr. Harold Zenick, (919) 541-2283

Responsible for scientific leadership and strategic planning of research to improve the scientific basis for risk assessments, including human health risk assessments, and ecological risks associated with global climate change. Worked as part of a multi-laboratory planning team, responsible for coordinating over $100 million of research efforts among multidisciplinary research divisions and communicating and coordinating research with external organizations. Charged with identifying emerging issues, developing new initiatives, and providing leadership in developing new approaches for improving human and ecological risk assessments.

Director, Research to Improve Health Risk Assessments Program (1991-1993)
Health Effects Research Laboratory
Office of Research and Development
US Environmental Protection Agency, Research Triangle Park, NC 27711 USA

Responsible for scientific leadership, strategic planning, and implementing a $7 million cross-laboratory research program targeted to improve the scientific basis for health risk assessments. This Congressionally-mandated program addressed critical uncertainties in human exposure assessment and dose-response assessment, including refining physiologically-based pharmacokinetic models and biologically-based dose-response models. Responsible for developing and implementing new research management approaches to achieve cross-organizational coordination. Accountable for program representation and evaluation by external review groups, including the Office of Technology Assessment and EPA's Science Advisory Board.

Environmental Scientist
Reproductive and Cancer Hazard Assessment Section
California Department of Health Services, Berkeley CA, on detail from EPA (1988-1989; on Intergovernmental Personnel Act detail from EPA)

Responsible for drafting guidelines for reproductive health risk assessments for the State of California, evaluating chemicals for listing under Proposition 65, and publishing original research to compare alternative approaches to estimate risks to male reproductive health.

Environmental Scientist (1988-1991)
Environmental Protection Specialist (1984-1988)

Pollutant Assessment Branch
Office of Air Quality Planning and Standards, US EPA, Research Triangle Park, NC USA

Responsible for evaluating hazardous air pollutants for regulatory action under the Clean Air Act and provided leadership of the National Air Toxics Information Clearinghouse, including coordination with State and local air quality agencies. Conducted exposure assessments using the Human Exposure Model (HEM) and health risk assessments for priority hazardous air pollutants including trichloroethylene, tetrachloroethylene, and hexavalent chromium. Evaluated short-term emission events from industrial facilities and analyzed consistency of results of HEM and monitoring data for hexavalent chromium.

Graduate Research Assistant (1980-1984)
School of Forestry and Environmental Studies
Duke University, Durham, NC, USA

Conducted research on formation and deposition of fine particulate matter to natural and surrogate surfaces. Designed and implemented field and laboratory studies including air monitoring systems and studies using radiolabeled sulfur. Taught graduate-level Weather and Climate classes including measurement methods and dispersion modeling to graduate students.

Teacher-Naturalist (1978-1980)
Woodland Altars Environmental Education Center
Peebles, OH

Responsible for developing and presenting innovative environmental education programs to grade school through high school-age students during their 3 to 5 day stay at the residential Center.

EDUCATION

PhD, Biophysical Ecology, Duke University, Durham, NC (1987). Research to develop and evaluate new methods for sulfur-containing aerosol generation and dry deposition of particulate matter air pollution.

MS, Biophysical Ecology, Duke University, Durham, NC (1982)

BA, Biology, The College of Wooster, Wooster, OH (1978)

AWARDS AND RECOGNITION

Distinguished Career Award, US EPA. 2021. This is a special gold medal award to recognize the cumulative achievements of an employee who has demonstrated exceptionally distinguished service.

Statesmanship Award, Office of Research and Development, US EPA. 2012. The most prestigious award given annually to an ORD employee who has demonstrated an exceptional service, support, and diplomacy.

Elected Fellow, Society for Risk Analysis, 2006.

Recipient of over twenty Bronze Medals for Commendable Service or Exceptional/Outstanding ORD Technical Assistance to the Regions or Program Offices, and recipient of numerous certificates of appreciation from domestic and international organizations for service on advisory committees and other support activities, including:

Bronze Medals for Commendable Service, Office of Research and Development, US EPA, 2015, 2016, 2017, 2018, 2019, 2020, 2021.

Bronze Medal for Exceptional/Outstanding ORD Technical Assistance to the Regions or Program Offices as a member of the Ozone NAAQS Regulatory Support Team, Office of Research and Development, US EPA, 2016.

Bronze Medal for Commendable Service, Office of Research and Development, US EPA, for Innovation in Science Assessment Team, 2014.

Bronze Medal for Commendable Service, Office of Research and Development, US for Forging International Partnerships for Advancing EPA's Mission of Protecting Human Health and the Environment, 2014.

Bronze Medal for Commendable Service, Office of Research and Development, US EPA, for IRIS Outreach Team activities to strengthen EPA's human health assessment program through the engagement of EPA's Programs and Regions and the public in the IRIS assessment development process, 2013.

Bronze Medal for Commendable Service, Office of Research and Development, US EPA, for contributions to the planning and implementation of the Human Health Risk Assessment Program, 2012.

Bronze Medal for Commendable Service, Office of Research and Development, US EPA, for contributions to the Health and Environmental Research Online (HERO) Team, 2011.
ORD Environmental Justice Award, Office of Research and Development, US EPA, for contributions to the Environmental Justice Symposium Team, 2011.

Recognition Award for ORD Response to Gulf Oil Spill, March 2011.

Bronze Medal for Commendable Service, Office of Research and Development, US EPA, for contributions to the Integrated Science Assessment Team, 2010.

Bronze Medal for Commendable Service, Office of Research and Development, US EPA, for contributions to the completion of EPA's air quality criteria for ozone and air quality criteria for lead, 2008.

Bronze Medal for Commendable Service, Office of Research and Development, US EPA, for contributions to the Particulate Matter Accomplishments Report, 2004.

Bronze Medal for Commendable Service, Office of Research and Development, US EPA, for initiative in strategic research planning, 1997.

Bronze Medal for Commendable Service, Office of Research and Development, US EPA, for scientific support of chemical hazard ranking, 1992.

Bronze Medal for Commendable Service, Office of Air Quality Planning and Standards, US EPA, for continued development and implementation of the National Air Toxics

Information Clearinghouse, 1992.

Bronze Medal for Commendable Service, Office of Air Quality Planning and Standards, US EPA, for development and implementation of the National Air Toxics Information Clearinghouse, 1992.

Bronze Medal for Commendable Service, Office of Air Quality Planning and Standards, US EPA, for air toxics regulatory decision support, 1985.

Numerous performance awards and letters of appreciation, 1984-2021.

SELECTED PUBLICATIONS

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Ginsberg, G., Pullen Fedinick, K., Solomon, G., Elliott, KC, Vandenberg, J.J., Barone Jr., S., and JR Bucher. New Toxicology Tools and the Emerging Paradigm Shift in Environmental Health Decision-Making. Environ Health Perspect; 127: 12 (2019) https://doi.org/10.1289/EHP4745.

Cote, Ila L., Shaun D. McCullough, Ronald H. Hines, John J. Vandenberg, Application of epigenetic data in human health risk assessment. Current Opinion in Toxicology 6: 71-78 (2017).

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Vandenberg, J.J., and K.R. Knoerr. Comparison of surrogate surface techniques for estimation of sulfate dry deposition. Proceedings: National Symposium on Recent Advances in Pollutant Monitoring of Ambient Air and Stationary Sources. EPA-600/9-84-001. 1984.

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U.S. EPA. Integrated Science Assessment of Oxides of Nitrogen – Health Criteria (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-15/068F, 2016.

U.S. EPA. Integrated Science Assessment (ISA) for Lead (2013) U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-10/075F, 2013.

U.S. EPA. IRIS Toxicological Review of Trimethylbenzenes, 2016. Washington, DC, EPA/635/R-16/161Fa

IRIS Toxicological Review of Hexachloroethane (2011). EPA/635/R-09/0007F

IRIS Toxicological Review of Acrylamide (2010). Washington, DC, EPA/635/R-16/161Fa, 2016

IRIS Toxicological Review of Ethylene Glycol Monobutyl Ether (EGBE) (2010).

IRIS Toxicological Review of Chloroprene (2010). EPA/635/R-09/010F

IRIS Toxicological Review of 1,4-dioxane (oral) (2010). EPA/635/R-09/005F

IRIS Toxicological Reviews of many other priority chemicals – responsible for all IRIS assessments completed from 2003-2008 as Associate Director of the National Center for Environmental Assessment and supervisor of the IRIS staff.

Biofuels and the Environment: Second Triennial Report to Congress (Final Report, 2018). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-18/195, 2018.

U.S. EPA. Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States (Final Report; Chapter 9). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-16/236F, 2016.

Status Report: Advances in Inhalation Dosimetry for Gases with Lower Respiratory Tract and Systemic Effects. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-11/067, 2011

Advances in Inhalation Dosimetry of Gases and Vapors with Portal of Entry Effects in the Upper Respiratory Tract (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-09/072, 2009.

Nanomaterial Case Studies: Nanoscale Titanium Dioxide in Water Treatment and in Topical Sunscreen (Final). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-09/057F, 2010.

Development and implementation of the Health and Environmental Research Online *HERO) database http://hero.epa.gov/

SELECTED PRESENTATIONS

Testimony to Senate Environment and Public Works Full Committee Hearing entitled "The Latest Science on Lead's Impacts on Children's Development and Public Health; July 12, 2012.

Testimony to the House Science, Space and Technology Subcommittee on Environment Hearing – Background Check: Achievability of New Ozone Standards; June 12, 2013.

Briefings to Assistant Administrator, Office of Research and Development, on priority topics including various IRIS assessments such as PCBs, arsenic, trimethylbenzenes, IRIS enhancements, and other activities such as comprehensive environmental assessment of nano-materials (2004-2013)

Briefings to the Administrator, EPA, on enhancements to the Integrated Risk Information System (2013 - 2020).

Numerous briefings to the EPA Administrator, Assistant Administrators, Office of Management and Budget, National Research Council, EPA Science Advisory Committee, EPA Board of Scientific Counselors including:

- EPA Science Advisory Board (including the Clean Air Scientific Advisory Committee); 1996, 1997, 1998, 1999, 2000, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020
- National Research Council Committee on Research Priorities for Airborne Particulate Matter, numerous times 1998, 1999, 2000;
- National Research Council Board of Environmental Science and Toxicology, 2014, 2016
- EPA Board of Scientific Counselors, 1998, 2000, 2001, 2005, 2007, 2008, 2015, 2016, 2017, 2020.

Numerous scientific presentations and risk assessment training sessions in Egypt, Dubai, Singapore, Saudi Arabia, Switzerland, Germany, Italy, Peru, Chile, Slovakia, and other countries.

SELECTED COMMITTEE ACTIVITIES

Secretaries' Science Advisory Board. North Carolina Department of Environmental Quality and Department of Health and Human Services. Appointed by Governor Roy Cooper 2017 - .

Air Toxics Science Advisory Board Member (2022 - present)
Oregon Department of Environmental Quality and Oregon Health Authority

Cleaner Air Oregon Hazard Index Technical Advisory Committee.
Oregon Department of Environmental Quality.
Appointed by the Oregon Environmental Quality Commission. (2018-2020).

National Academy of Sciences, Emerging Science for Environmental Health Decisions, advisory committee member, 2016-2021.

National Institute of Occupational Health and Safety, Risk Assessment Program external review panel, Cincinnati OH. 2011.

Center for Environmental Medicine, Asthma and Lung Biology external review panel, University of North Carolina, Chapel Hill, NC 2011.

Bisphenol A Subcommittee of the Science Board to the Food and Drug Administration, 2008.

Scientific Advisory Committee, Johns Hopkins Particle Matter Research Center, Baltimore, MD 2005-2008.

Councilor, Society for Risk Analysis, (national elected position), 1999-2002.

External Scientific Advisory Committee, National Environmental Respiratory Center, Lovelace Respiratory Research Institute, Albuquerque, NM, 1998- 2005.

National Institute of Environmental Health Sciences, International Program on Chemical Safety, 1995.

Aerosol Research Inhalation Epidemiological Study (ARIES) Scientific Advisory Committee, Electric Power Research Institute, Palo Alto, CA, 2000-2008.

Scientific Advisory Panel, Mickey Leland National Urban Air Toxics Research Center, Houston, TX, 1997-2001.

Advisory Committee, Harvard Center for Risk Analysis, Boston, MA 1993-1997; 2001. Scientific Advisory Committee, Southern California Particle Center and Supersite, Los Angeles, CA, 2000-2005.

EPA Office of Research and Development Awards Committee representative, 1997-2000. Chair, Grants Management Committee, Society for Risk Analysis, 2000.

Co-chair, Internationalization Committee, Society for Risk Analysis, 2000.

Representative of the National Health and Environmental Effects Research Laboratory to the EPA Research Triangle Park Diversity committee, 1998-1999.

Chair, Particulate matter grants selection, Science to Achieve Results program grants, National Center for Environmental Research, Research Triangle Park, NC 1996, 1997, 1998, 1999, 2000.

Symposium Advisory Committee, Indicators in Health and Ecological Risk Assessment, National Health and Environmental Effects Research Laboratory, 2000.

Chair, Particulate Matter Centers Liaison Committee, Office of Research and Development, 2000.

International Steering Committee, NERAM, Ottawa, Canada, 2000 – 2005.

Organizer, Particulate Matter Working Group, Air Quality Research Subcommittee, Committee on Environment and Natural Resources, Office of Science and Technology Policy, White House, Washington, DC, 1999 - 2002.

Program Advisory Committee, 3rd Colloquium on Particulate Air Pollution and Human Health, 1999.

Health Effects Institute Advisory Committee, Fourteenth HEI Annual Conference, 1998. Councilor, Research Triangle Chapter of the Society for Risk Analysis (chapter elected position), 1996.

Organizer and Chair, Emerging biologically-based dose-response models for both carcinogenic and noncarcinogenic endpoints symposium, Society for Risk Analysis Annual Meeting, December, 1996.

Chair, Benchmark Dose Working Group, Risk Assessment Forum, EPA, 1993-1994. President, New Hope chapter of National Audubon Society (elected position), 1992.

PEER REVIEWER and CONSULTATIONS (selected)

Expert Consultation on Particulate Matter. IRIDIUM project of Netherlands, National Institute for Public Health and the Environment, Utrecht University, Amsterdam University and Netherlands Environmental Assessment Agency. 2013.

National Institute of Occupational Health and Safety, Risk Assessment Program, Cincinnati OH. 2011.

Center for Environmental Medicine, Asthma and Lung Biology, Chapel Hill, NC 2011.

Bisphenol-A science review panel, Food and Drug Administration, 2008.

Lovelace Respiratory Research Institute peer panel (for Dept of Energy), 1997.

National Institute of Environmental Health Sciences, International Program on Chemical Safety, 1995.

Risk Analysis - ad hoc.

Journal of Toxicology and Environmental Health. 1992 – present.

Other journals – ad hoc.

MEMBERSHIPS

Member and elected Fellow, Society for Risk Analysis

Member, Society of Toxicology

STUDENT ADVISING AND MENTORING

Academic major advisor, Ph.D. program, The Graduate School, Duke University, Durham, NC: Margaret Menache (1997).

Academic advisor, Masters of Environmental Management, Nicholas School of the Environment, Duke University, Durham, NC:

Tanya Girouard (1998) Julie Gough (1998) Michael Peterson (1998) Melissa Melvin (1998) Jennifer Crawford (1997) Elizabeth Kormeier (1997) David Stevenson (1997) Suzanne Zechiel (1997) S. Charles Wheat (1997) Brian Stone, Jr. (1996) N. Peter Jensen (1996) Sharon Sigethy (1995) Richard Sprott (1994) Sarah Mazur (2005) Alyssa Quarforth (2006) Kristen Wiedner (2007) Nicole Hagan (2008) Ramsey Ramadan (2011) Jiaqi Li (2019)

Attachment 2

Attachment 2

Annual Air Emissions of Chloroprene (lb/yr) from the Denka Facility Reported by Denka and DuPont to the EPA Toxics Release Inventory[37]										
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Denka pounds/yr				42,800	238,607	199,100	52,529	39,597	35,531	36193
DuPont pounds/yr	249,730	252,000	262,000	207,700						

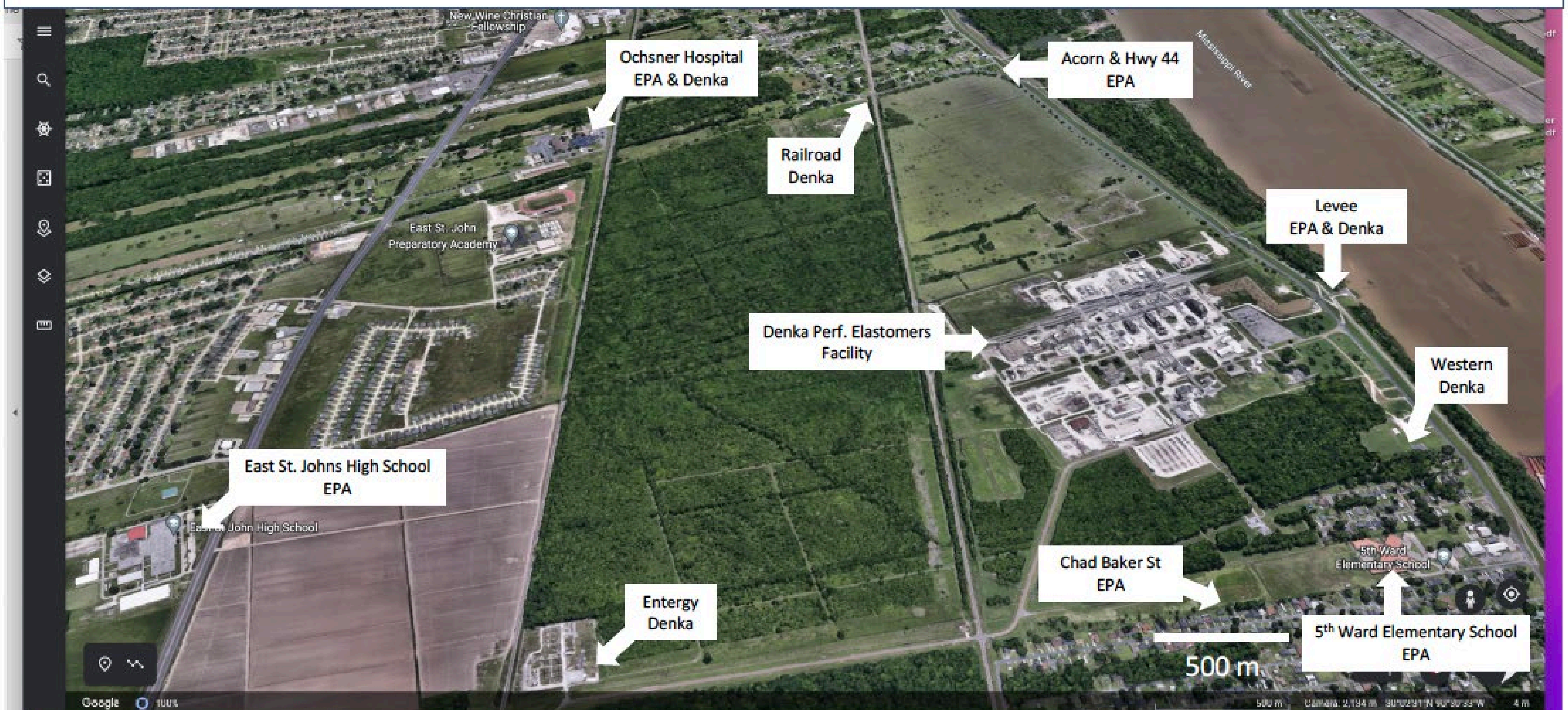
[37] https://edap.epa.gov/public/extensions/TRIToxicsTracker/TRIToxicsTracker.html#continue

Attachment 3

Attachment 3

Approximate location of EPA and Denka Active air monitoring sites in relation to Denka Performance Elastomers Facility; scale 500 m looking east

EPA & Denka Monitoring Sites in relation to Denka Performance Elastomers Facility: scale 500 m, looking east



Google Earth (May 21, 2022)

Attachment 4

Attachment 4

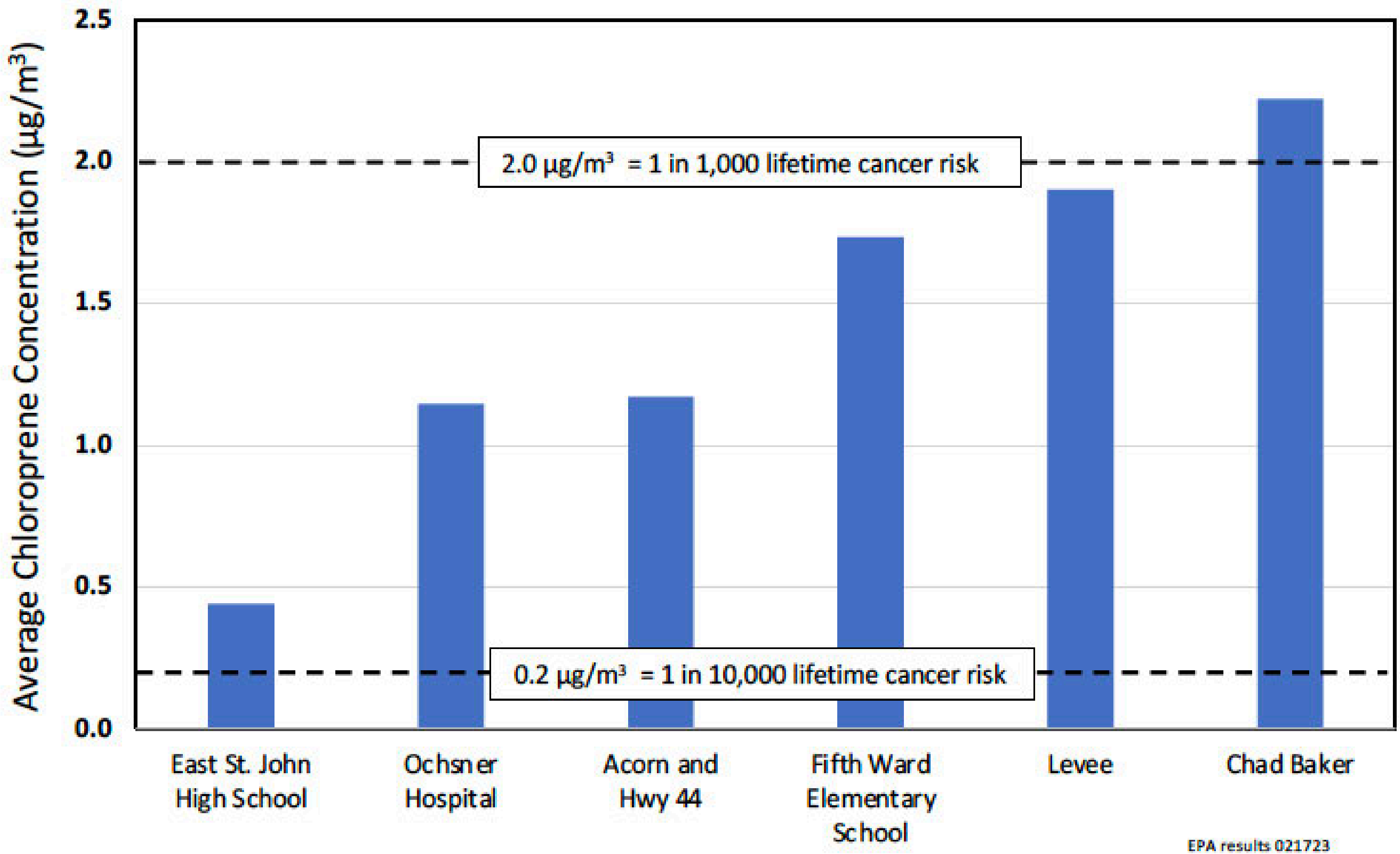
Average chloroprene air concentrations measured at the EPA and Denka Active monitors following the commencement of stable operations of the Regenerative Thermal Oxidizer system in April 2018

EPA active monitor sites (April 2018 to Sept 2020)	Average chloroprene concentrations µg/m^3
Chad Baker	2.22
5th Ward Elementary	1.73
Levee	1.90
Acorn and Hwy 44	1.17
Ochsner Hospital	1.15
East St. John High School	0.44

Denka active monitor sites (April 2018 to January 2023)	Average chloroprene concentrations µg/m^3
Western	2.89
Levee	2.21
Railroad	1.26
Ochsner Hospital	1.06
Entergy	0.89
Edgard	0.41

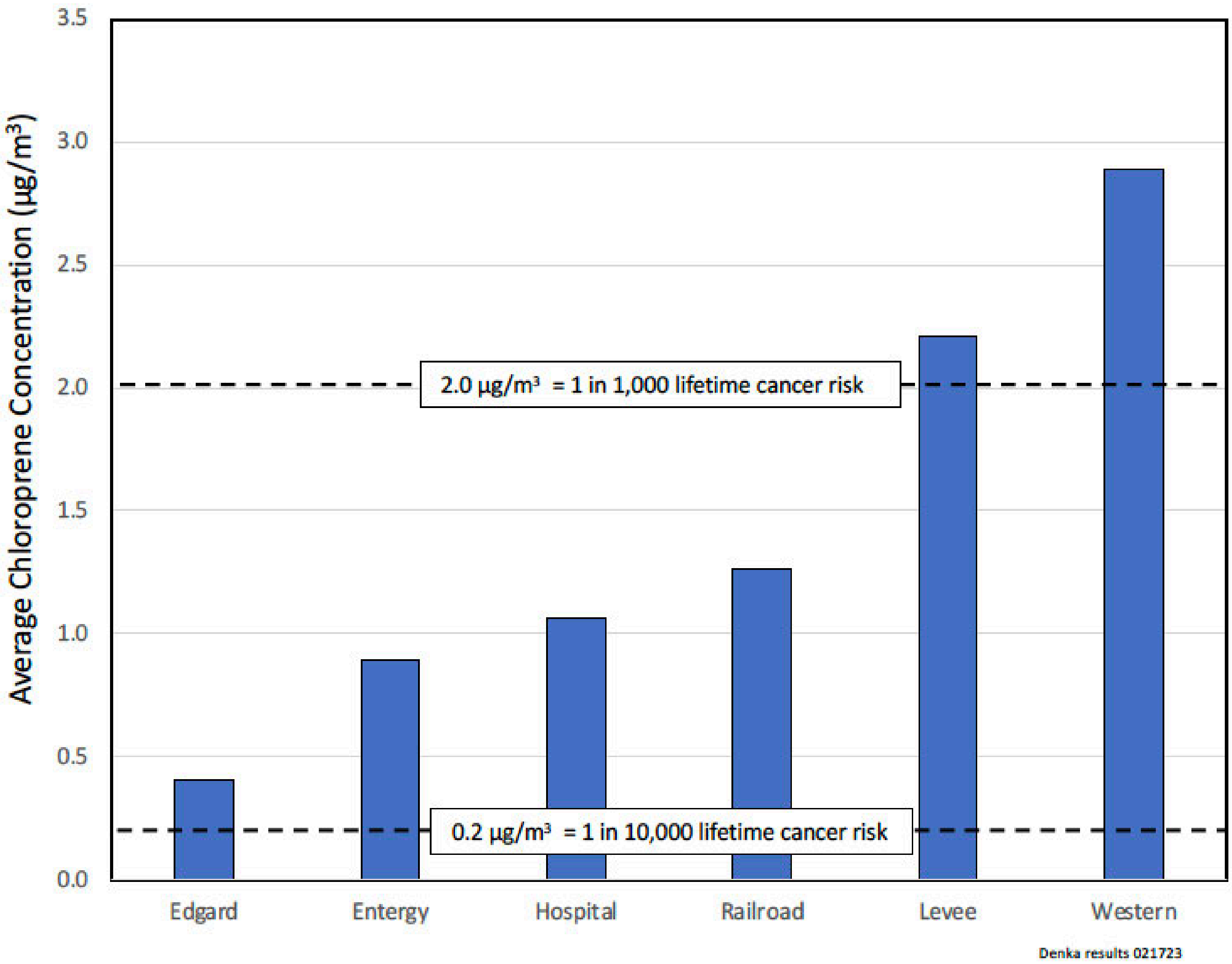
Attachment 5

Attachment 5
EPA Active monitoring results for chloroprene (April 2018–Sept. 2020)



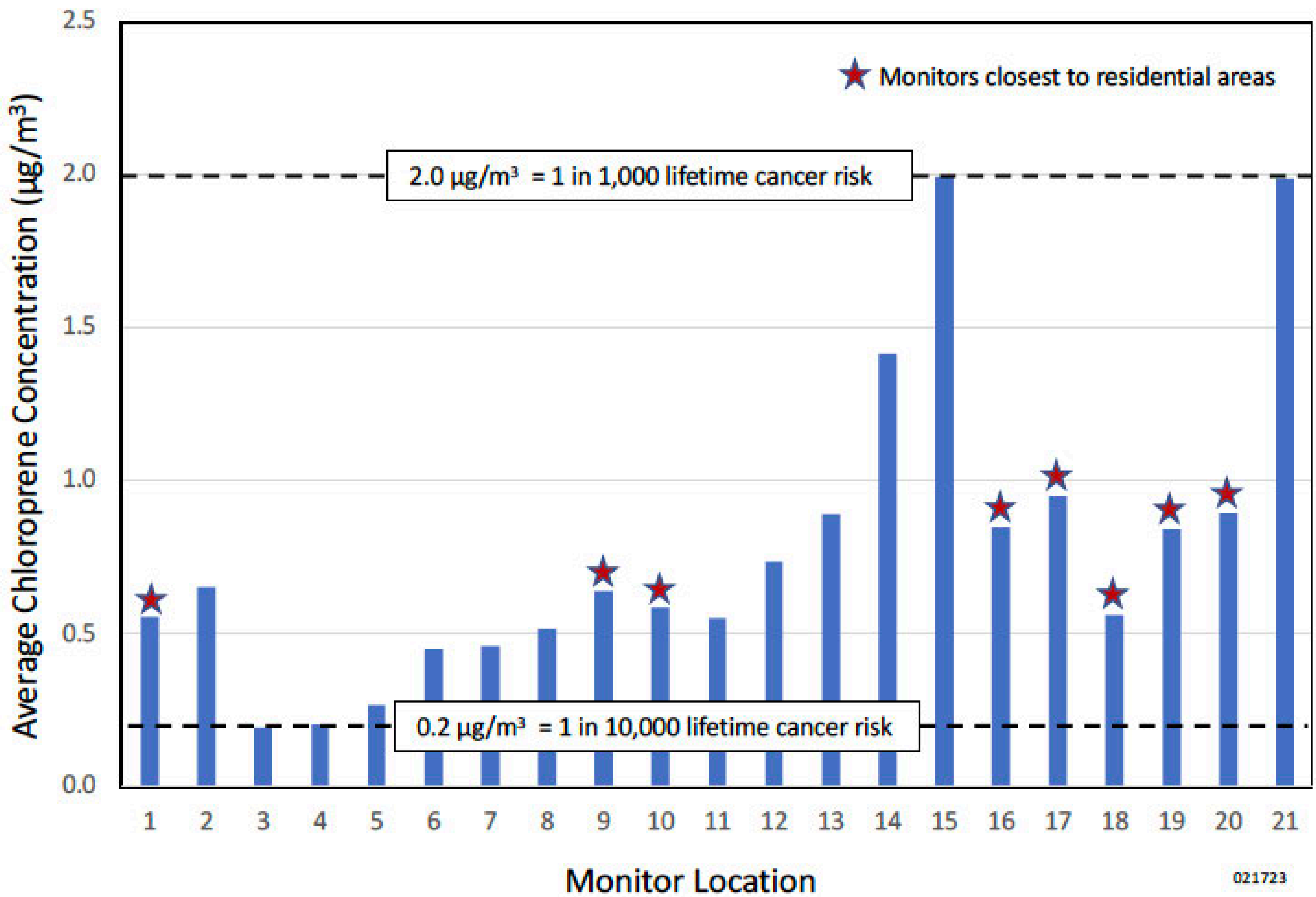
Attachment 6

Attachment 6
Denka Active monitoring results for chloroprene (April 2018 through January 2023)



Attachment 7

Attachment 7
Denka every 2-week Passive monitoring results for chloroprene



Attachment 8

Attachment 8

Examples of EPA's and Other U.S. Federal Agencies' Policies that a Lifetime Excess Cancer Risk Greater Than 1-in-10,000 is Unacceptably High	
Source & Reference	**Text**
Clean Air Act: Hazardous Air Pollutants, 42 U.S.C. § 7412(f)(2)(B) (1990)	"Nothing in subparagraph (A) or in any other provision of this section shall be construed as affecting, or applying to the Administrator's interpretation of this section, as in effect before November 15, 1990, and set forth in the Federal Register of September 14, 1989 (54 Federal Register 38044)."
Food Quality Protection Act of 1996, 21 U.S.C. § 346a(b)(2)(A)(i)-(ii), (B)(vi) and (b)(2)(C)(ii)	The Administrator may establish or leave in effect a tolerance for a pesticide chemical residue in or on a food only if the Administrator determines that the tolerance is safe. The Administrator shall modify or revoke a tolerance if the Administrator determines it is not safe." * * * As used in this section, the term "safe", with respect to a tolerance for a pesticide chemical residue, means that the Administrator has determined that there is a reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposures and all other exposures for which there is reliable information.
National Emission Standards for Hazardous Air Pollutants; Benzene Emissions, 54 Fed. Reg. 38,044, 38,045 (Sept. 14, 1989)	"In protecting public health with an ample margin of safety under section 112, EPA strives to provide maximum feasible protection against risks to health from hazardous air pollutants by (1) protecting the greatest number of persons possible to an individual lifetime risk level no higher than approximately 1 in 1 million and (2) limiting to no higher than approximately 1 in 10 thousand the estimated risk that a person living near a plant would have if he or she were exposed to the maximum pollutant concentrations for 70 years."
Residual Risk: Report to Congress, EPA-453/R-99-001 at ES-11, 78 (March 1999) https://www3.epa.gov/airtoxics/rrisk/risk_rep.pdf	As stated in the preamble to the rule for benzene, which is a linear carcinogen (i.e., a carcinogen for which cancer risk is believed or assumed to vary linearly with exposure), "an MIR (maximum individual risk) of approximately 1 in 10 thousand should ordinarily be the upper-end of the range of acceptability."

EPA Cancer Guidelines, 70 FR 17765, 17811–12 (April 7, 2005)	"The linear default is thought to generally provide an upper-bound calculation of potential risk at low doses, for example, a 1/100,000 to 1/1,000,000 risk. This upper bound is thought to be public-health protective at low doses for the range of human variation, considering the typical Agency target range for risk management of 1/1,000,000 to 1/10,000, although it may not completely be so (Bois et al., 1995) if pre-existing disease or genetic constitution place a percentage of the population at greater risk from exposure to carcinogens."
Superfund Remedial Action Cleanup Goals, 40 C.F.R. § 300.430(e)(2)(i)(A)(2) (1986)	"For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 10−4 and 10−6 using information on the relationship between dose and response."
U.S. Center for Disease Control and Prevention - National Institute for Occupational Safety and Health (NIOSH), Current Intelligence Bulletin 68 - NIOSH Chemical Carcinogen Policy, p. 25 (July 2017), available at https://www.cdc.gov/niosh/docs/2017-100/pdf/2017-100.pdf	"NIOSH will set the [risk management limit for carcinogens (RML-CA)] for an occupational carcinogen at the estimated 95% lower confidence limit on the concentration (e.g., dose) corresponding to 1 in 10,000 (10^{-4}) excess lifetime risk, when analytically possible to measure." P.vi "An excess lifetime risk level of 1 in 10,000 is considered to be a starting point for continually reducing exposures in order to reduce the remaining risk." p.20 "exposures should be kept below a risk level of 1 in 10,000, if practical."
Department of Defense, Dept. of Def. Manual, No. 4715.20 (March 9, 2012, incorporating change 1, Aug. 31, 2018) available at https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodm/471520m.pdf	"The acceptable risk ranges includes the situation where the excess cumulative upper-bound lifetime cancer risk to an individual is between one-in-ten-thousand and one-in-a-million (otherwise known as "10-4" and "10-6"), or less than one-in-a-million (e.g., one-in-ten million otherwise known as "10-7") and the hazard quotient/hazard index for non-cancer adverse effects is equal to or less than 1. (See subpart 300.430(e)(2)(i)(A)(2) of NCP and OSWER Directive 9355.0-30 (Reference (az)) for more information on acceptable exposure levels.)"

Attachment 9

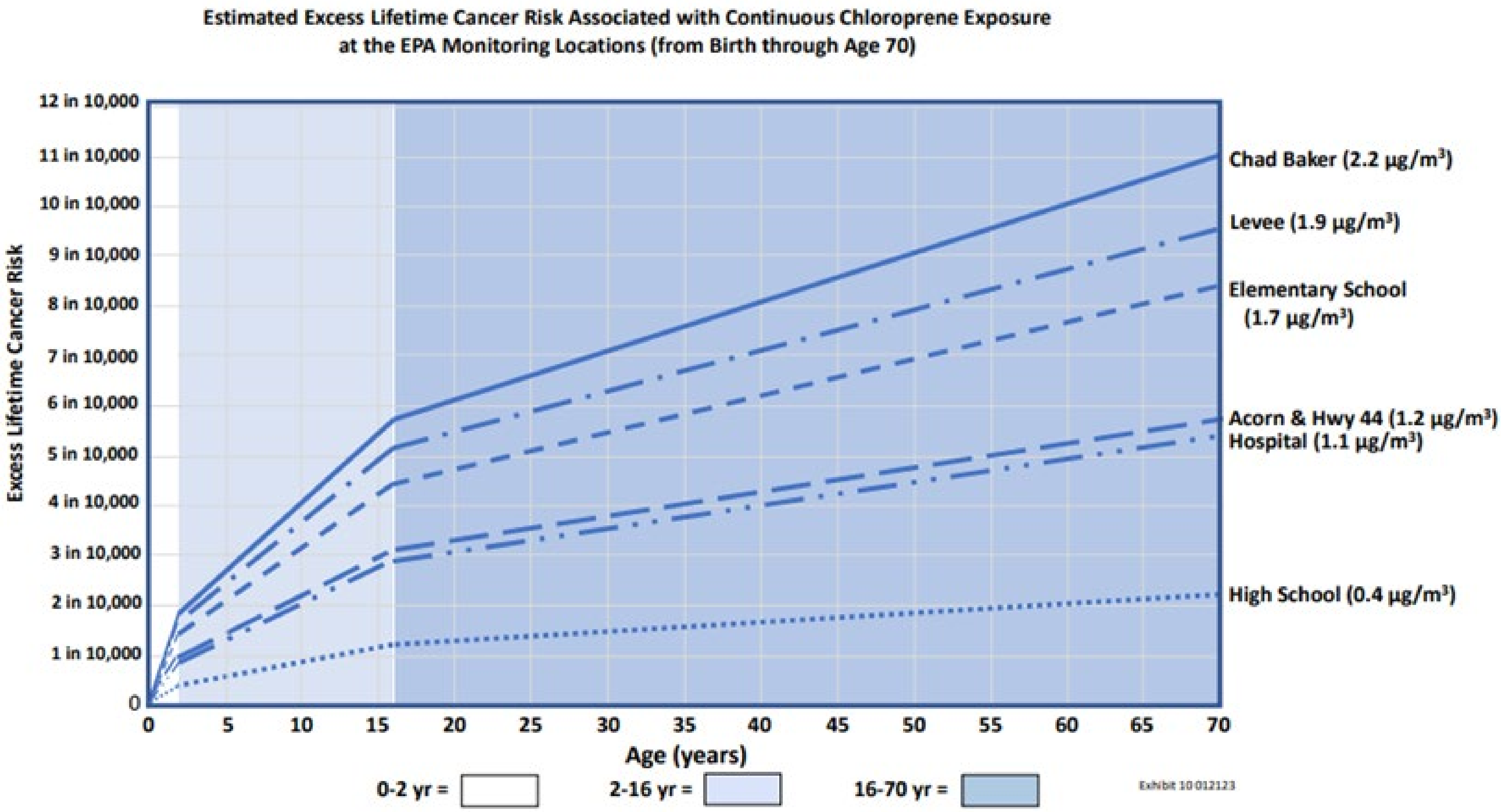
Attachment 9

Cancer Risks Exceed 1-in-10,000 at All Monitor Locations Out to Two and a Half Miles from the Denka Facility following the commencement of stable operations of the Regenerative Thermal Oxidizer system in April 2018 [through 1/30/23]

EPA and (Denka) Monitor Sites	Estimated Lifetime Excess Cancers per 10,000 People	Distance from Denka Facility to monitor location
(Western)	14	0.6
Chad Baker	11	0.6
(Levee)	11	0.5
Levee	10	0.5
5th Ward Elementary	9	0.7
(Railroad)	6	0.9
Acorn and Hwy 44	6	1.0
Ochsner Hospital	6	1.1
(Ochsner Hospital)	5	1.1
(Entergy)	4	1.1
East St. John High School	2	1.6
(Edgard)	2	2.6

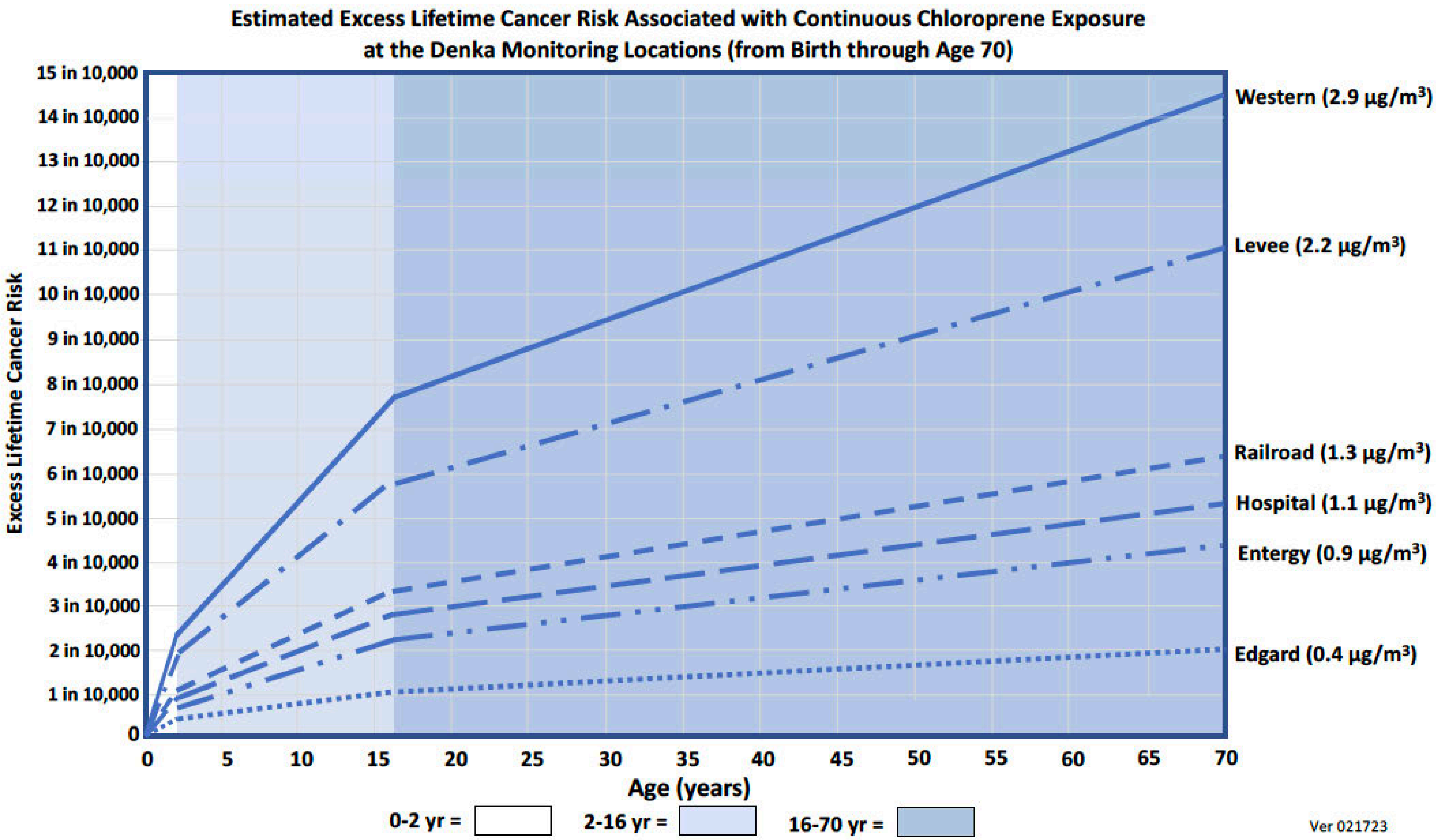
Attachment 10

Attachment 10



Attachment 11

Attachment 11



Attachment 12

Denka Active Monitor Results April 2, 2018 through January 30, 2023
Non-Detect values designated "ND"

Date	Edgard (µg/m³)	Entergy (µg/m³)	Hospital (µg/m³)	Levee (µg/m³)	Railroad (µg/m³)	Western (µg/m³)
4/2/2018	ND	ND	ND	void	ND	ND
4/6/2018	ND	ND	ND	ND	0.3	ND
4/11/2018	ND	4.5	5.4	4.1	3	7.4
4/16/2018	Void	ND	39.1	ND	13.7	ND
4/20/2018	2.1	3.5	0.8	5.5	0.6	22.8
4/24/2018	ND	ND	ND	6	2.4	0.4
4/27/2018	ND	ND	ND	20.6	4.2	6.8
4/30/2018	ND	0.2	ND	ND	ND	ND
5/4/2018	ND	ND	ND	ND	ND	ND
5/9/2018	ND	11.2	0.2	ND	ND	ND
5/14/2018	0.4	ND	ND	0.8	0.7	0.9
5/18/2018	ND	0.5	0.4	0.2	1.1	0.2
5/23/2018	ND	ND	ND	0.2	ND	ND
5/28/2018	ND	ND	ND	2.6	ND	1.9
6/1/2018	ND	ND	0.5	ND	0.2	ND
6/6/2018	ND	ND	47.1	63.7	40.2	32.1
6/11/2018	ND	0.6	ND		ND	ND
6/15/2018	ND	4.6	ND	0.8	ND	4.1
6/20/2018	ND	ND	0.4	0.5	ND	ND
6/25/2018	ND	ND	1.2	0.8	1.4	0.5
6/29/2018	ND	ND	ND	ND	0.9	ND
7/4/2018	ND	ND	ND	0.8	ND	ND
7/9/2018	0.2	0.2	ND	15.8	0.2	13.2
7/13/2018	ND	ND	0.6	ND	2.4	ND
7/18/2018	0.5	0.4	2	ND	0.7	ND
7/23/2018	ND	0.2	ND	ND	3.3	1.3
7/27/2018	ND	ND	0.7	0.5	1.6	ND
8/1/2018	ND	ND	void	1	void	0.7
8/6/2018	0.2	0.4	0.2	ND	0.3	0.6
8/10/2018	ND	ND	0.6	0.3	3.3	ND
8/15/2018	ND	ND	0.2	0.2	ND	0.3
8/20/2018	ND	ND	1	ND	0.5	ND
8/24/2018	ND	0	ND	ND	ND	3.5
8/29/2018	ND	ND	ND	ND	ND	0.5
9/4/2018	ND	ND	ND	ND	ND	0.3
9/7/2018	ND	ND	ND	1.8	ND	3.1
9/12/2018	2	1.8	ND	0.4	ND	7.5
9/17/2018	ND	0.6	20.2	5.8	31.9	ND
9/21/2018	0.7	0.4	0.5	1	0.5	6.1
9/26/2018	ND	ND	0.4	ND	1.2	ND
10/1/2018	4.5	0.7	1.8	9	0.9	33.6

Date	Edgard (µg/m³)	Entergy (µg/m³)	Hospital (µg/m³)	Levee (µg/m³)	Railroad (µg/m³)	Western (µg/m³)
10/5/2018	ND	0.3	ND	ND	ND	ND
10/9/2018	ND	ND	ND	1.4	ND	2.4
10/12/2018	1.7	2.8	34.9	81.5	41.6	13.8
10/17/2018	ND	ND	ND	ND	ND	1.4
10/20/2018	ND	ND	ND	0.2	ND	ND
10/24/2018	void	ND	ND	ND	ND	ND
10/29/2018	ND	1	3.8	0.2	0.9	1.1
11/2/2018	ND	ND	1.4	0.3	3.3	ND
11/7/2018	ND	ND	ND	0.5	ND	1.8
11/12/2018	ND	ND	ND	1.2	ND	ND
11/16/2018	0.6	1.2	9.1	4.2	4.2	17.8
11/20/2018	ND	ND	ND	2.9	ND	2.6
11/26/2018	ND	ND	ND	4.1	ND	0.4
12/1/2018	ND	0.5	0.9	ND	ND	ND
12/5/2018	1.3	ND	ND	0.4	ND	9
12/10/2018	ND	ND	ND	2.6	ND	0.7
12/14/2018	ND	ND	ND	ND	2.6	ND
12/19/2018	ND	ND	ND	1.4	ND	5.9
12/24/2018	4.3	ND	ND	ND	ND	5.4
12/28/2018	ND	ND	ND	2.2	ND	16.5
1/2/2019	1.6	ND	ND	10.9	ND	5.4
1/7/2019	ND	ND	1.3	ND	0.2	ND
1/11/2019	2.1	2.8	ND	ND	ND	2
1/16/2019	0.3	0.5	0.3	ND		
1/18/2019					0.2	ND
1/21/2019	0.2	0.2	ND	ND	ND	ND
1/25/2019	1.3	8	0.4	1.9	ND	5.3
1/30/2019	1.4	1.7	ND	0.2	ND	2.2
2/4/2019	ND	1.5	ND	ND	ND	ND
2/5/2019				0.5		
2/6/2019	ND		ND			
2/8/2019		ND			ND	7.5
2/13/2019	void	1.4	ND	0.2	ND	0.3
2/16/2019			ND			
2/18/2019	0.3	ND		ND	ND	2.1
2/22/2019	ND	ND	ND	ND	ND	ND
2/27/2019	ND	0.6	2.4	ND	ND	ND
3/4/2019	ND	ND	ND	9.3	ND	0.6
3/8/2019	ND	2	ND	ND	ND	ND
3/13/2019	ND	ND	ND	ND	ND	ND
3/18/2019	0.3	ND	ND	ND	ND	12.6
3/22/2019	3.3	0.8	2.2	1.8	4.6	2.2
3/27/2019	2	2.4	7.1	10.8	3.3	8.2

Date	Edgard (µg/m^3)	Entergy (µg/m^3)	Hospital (µg/m^3)	Levee (µg/m^3)	Railroad (µg/m^3)	Western (µg/m^3)
4/1/2019	ND	0.4	ND	7.7	ND	2.4
4/5/2019	0.5	2.7	ND	ND	ND	1.6
4/10/2019	ND	ND	0.8	ND	ND	ND
4/15/2019	ND	0.9	2.5	0.2	0.9	ND
4/19/2019	ND	ND	ND	0.6	13	ND
4/24/2019	ND	16	0.6	ND	ND	ND
4/29/2019	ND	2.1	ND	ND	ND	ND
5/3/2019	0.4	2.2	0.4	ND	0.6	ND
5/7/2019	ND	2.6	0.3	ND	ND	ND
5/13/2019	ND	ND	ND	15.3	ND	11
5/17/2019	ND	1.3	ND	ND	ND	ND
5/22/2019	0.4	0.3	ND		ND	0.7
5/27/2019	ND	ND	ND	ND	ND	ND
5/31/2019	ND	ND	1.3	ND	3.4	ND
6/5/2019	0.3	0.4	1.5	ND	0.2	0.3
6/10/2019	ND	ND	ND	29.5	ND	5.4
6/14/2019	ND	1.3	ND	ND	ND	ND
6/19/2019	ND	ND	1.6	ND	1	ND
6/23/2019			ND			
6/24/2019	0.4	1.2	0.2	0.5	0.3	2.1
6/28/2019	ND	0.3	ND	2.4	0.3	5.8
7/3/2019	ND	0.3	1.7	1.2	1.6	1.3
7/8/2019	ND	ND	0.3	0.6	3.7	ND
7/15/2019	ND	ND	void	ND	ND	ND
7/18/2019	ND	1.3	4.8	0.3	1.2	ND
7/22/2019	ND	ND	1.4	ND	5.8	ND
7/26/2019	ND	0.4	ND	ND	ND	ND
7/31/2019	ND	ND	2.1	2.5	2.8	ND
8/5/2019	ND	ND		ND	4.6	ND
8/9/2019	ND	ND	1.3	0.3	6.2	ND
8/14/2019	ND	ND		1.6	0.7	4.2
8/19/2019	ND	0.4		0.4	1.1	0.2
8/23/2019	ND	ND		0.9	ND	2.7
8/28/2019	ND	ND	1.4	1.9	0.6	2.2
9/3/2019	ND	ND	1	5.6	1.4	2.4
9/6/2019	ND	ND	4.5	7.7	7.6	0.8
9/11/2019	ND	2.3	ND	3.1	ND	2.2
9/16/2019	0.6	0.3	ND	ND	ND	2.1
9/20/2019	0.3	ND	ND	ND	ND	ND
9/25/2019	ND	0.3	0.8	1.7	5	ND
9/30/2019	1.1	7.7	ND	0.2	ND	11.4
10/4/2019	0.3	ND	ND	0.7	ND	3.9
10/9/2019	1.6	1.1	0.2	0.5	ND	20.9

Date	Edgard (μg/m³)	Entergy (μg/m³)	Hospital (μg/m³)	Levee (μg/m³)	Railroad (μg/m³)	Western (μg/m³)
10/14/2019	0.4	ND	ND	1.7	ND	1.2
10/18/2019	ND	ND	ND	1.1	ND	3.9
10/23/2019	2.4	ND	ND	2.4	ND	17.5
10/28/2019	ND	ND	ND	0.4	ND	0.4
11/1/2019	ND	ND	ND	0.5	ND	ND
11/6/2019	ND	ND	ND	ND	ND	ND
11/11/2019	ND	ND	ND	ND	ND	ND
11/15/2019	ND	ND	ND	30	ND	ND
11/20/2019	3.4	1.1	ND	ND	ND	4.4
11/25/2019	ND	4.2	ND	ND	ND	ND
11/29/2019	0.9	1.6	ND	ND	ND	ND
12/4/2019	2.5	ND	ND	33.1	ND	58.7
12/9/2019	ND	ND	0.3	ND	ND	ND
12/13/2019	0.3	1	1.1	3.5	1.2	3.4
12/18/2019	ND	ND	ND	2.6	ND	1.9
12/23/2019	ND	ND	ND	3.5	ND	ND
12/27/2019	1.3	ND	ND	ND	ND	ND
1/1/2020	0.2	0.4	ND	ND	ND	0.3
1/6/2020	ND	ND	0.5	0.7	ND	ND
1/10/2020	ND	0.4	ND	ND	ND	ND
1/15/2020	3.7	3.5	ND	1.6	0.3	2.8
1/20/2020	ND	ND	ND	3	ND	0.5
1/24/2020	0.2	ND	ND	1.2	ND	ND
1/29/2020	0.3	ND	ND	0.3	ND	1.2
2/3/2020	ND	0.9	0.2	ND	ND	ND
2/7/2020	ND	ND	0.2	ND	ND	ND
2/12/2020	ND	ND	0.3	ND	ND	ND
2/17/2020	void	4.9	ND	ND	ND	ND
2/21/2020	ND	ND	ND	1.1	ND	7.8
2/26/2020	ND	ND	ND	4.3	ND	ND
3/2/2020	ND	ND	0.6	ND	ND	ND
3/6/2020	ND	ND	ND	0.5	ND	0.5
3/11/2020	ND	ND	0.5	ND	0.2	ND
3/16/2020	ND	0.3	ND	0.3	ND	0.3
3/20/2020	ND	ND	ND	0.7	ND	3.1
3/25/2020	ND	ND	2	ND	1.1	ND
3/30/2020	ND	0.3	ND	ND	ND	ND
4/3/2020	2.2	1	ND	0.8	ND	1.7
4/8/2020	ND	ND	1.1	ND	2	ND
4/13/2020	ND	ND	ND	4.2	ND	4.9
4/17/2020	ND	1.2	ND	0.9	ND	ND
4/22/2020	ND	0.2	0.5	ND	ND	ND
4/27/2020	ND	0.3	ND	ND	ND	2.2

Date	Edgard ($\mu g/m^3$)	Entergy ($\mu g/m^3$)	Hospital ($\mu g/m^3$)	Levee ($\mu g/m^3$)	Railroad ($\mu g/m^3$)	Western ($\mu g/m^3$)
5/1/2020	ND	1.3	1.3	0.4	0.6	0.3
5/6/2020	0.2	ND	ND	2.9	ND	1.1
5/11/2020	0.8	0.6	ND	ND	ND	9.6
5/15/2020	ND	0.5	ND	ND	ND	ND
5/20/2020	ND	0.7	ND	ND	ND	0.2
5/24/2020	ND	0.3	ND	ND	ND	ND
5/29/2020	0.2	ND	1	5	0.8	4.9
6/3/2020	ND	0.4	ND	0.3	ND	0.3
6/8/2020	ND	ND	ND	ND	ND	ND
6/12/2020	ND	ND	ND	0.5	ND	ND
6/17/2020	ND	0.2	0.3	1.4	0.2	ND
6/22/2020	ND	ND	ND	ND	ND	ND
6/26/2020	ND	ND	ND	ND	ND	ND
7/1/2020	ND	ND	1.3	ND	1.8	ND
7/6/2020	void	ND	0.5	ND	ND	ND
7/10/2020	ND	ND	ND	ND	ND	ND
7/15/2020	ND	ND	ND	ND	ND	ND
7/20/2020	ND	ND	ND	ND	ND	ND
7/24/2020	ND	ND	ND	ND	ND	ND
7/29/2020	ND	ND	1.4	ND	1.9	ND
8/3/2020	ND	ND	0.8	2.5	3.8	ND
8/7/2020	ND	0.6	1.1	5.6	1.6	0.5
8/12/2020	ND	ND	0.5	0.2	0.8	ND
8/17/2020	ND	ND	ND	2.9	ND	1
8/21/2020	ND	0.3	ND	0.3	ND	ND
8/26/2020	ND	1.6	ND	ND	ND	ND
8/31/2020	ND	0.5	0.2	ND	0.7	ND
9/4/2020	ND	ND	0.4	7.2	0.3	0.7
9/9/2020	1.3	ND	ND	6.1	ND	6.2
9/15/2020	ND	ND	ND	2.1	ND	ND
9/19/2020	0.2	ND	ND	ND	ND	ND
9/23/2020	ND	0.4	ND	ND	3	ND
9/28/2020	ND	ND	ND	3.8	0.3	0.4
10/2/2020	0.9	ND	0.3	1.6	0.7	3
10/7/2020	3.6	ND	2.2	ND	ND	5.3
10/12/2020	ND	ND	ND	0.5	1.3	0.5
10/16/2020	0.5	ND	ND	ND	ND	3.7
10/21/2020	1.3	ND	ND	ND	ND	0.8
10/26/2020	0.9	ND	ND	1.2	ND	2.8
10/30/2020	ND	ND	ND	void	ND	12.6
11/4/2020	0.7	ND	ND	2.7	ND	5.8
11/9/2020	void	ND	ND	ND	ND	2.2
11/13/2020	6.4	8.9	ND	ND	ND	10.7

Date	Edgard (µg/m³)	Entergy (µg/m³)	Hospital (µg/m³)	Levee (µg/m³)	Railroad (µg/m³)	Western (µg/m³)
11/18/2020	3.2	ND	ND	7.2	ND	28.9
11/23/2020	0.9	ND	ND	0.4	ND	2.2
11/27/2020	ND	ND	ND	2	0.3	1.2
12/2/2020	0.3	ND	ND	ND	ND	1.2
12/7/2020	ND	ND	0.9	8	2.3	1.8
12/11/2020	ND	ND	0.8	0.6	1.7	0.3
12/16/2020	ND	ND	ND	4.2	ND	ND
12/21/2020	ND	ND	8.7	2.8	3.7	1.1
12/26/2020	1.3	3.3	ND	0.3	ND	3.1
12/30/2020	ND	0.9	ND	ND	ND	ND
1/4/2021	ND	ND	0.4	1.7	0.4	1.1
1/8/2021	ND	ND	ND	6.6	ND	ND
1/13/2021	ND	ND	2.5	ND	2	ND
1/17/2021	ND	6.2	20.2	19.2	36.9	8
1/22/2021	ND	ND	ND	ND	ND	0.3
1/27/2021	ND	ND	ND	0.8	ND	0.3
2/1/2021	ND	ND	ND	0.3	ND	ND
2/5/2021	0.8	ND	ND	ND	ND	0.3
2/10/2021	1.4	0.5	ND	ND	ND	0.5
2/16/2021	ND	ND	ND	1.3	ND	8.8
2/19/2021	ND	ND	ND	13.1	ND	0.2
2/24/2021	ND	0.5	0.3	1.1	0.2	0.3
3/1/2021	ND	ND	ND	0.4	ND	4.6
3/5/2021	0.7	ND	ND	0.8	ND	3.4
3/10/2021	ND	5.9	ND	ND	ND	ND
3/15/2021	ND	0.5	1.2	ND	ND	ND
3/19/2021	ND	ND	ND	3.9	ND	2.4
3/24/2021	0.4	ND	ND	ND	ND	0.4
3/29/2021	ND	2.8	ND	ND	ND	ND
4/2/2021	1.1	22.8	6.7	10.1	5.5	8.5
4/7/2021	ND	ND	0.5	0.6	0.2	ND
4/12/2021	0.3	0.8	ND	ND	ND	ND
4/16/2021	0.4	ND	ND	ND	ND	0.9
4/21/2021	0.9	ND	ND	2.8	ND	4.9
4/26/2021	ND	3.6	ND	ND	ND	ND
5/1/2021	ND	0.3	0.4	ND	ND	ND
5/5/2021	ND	ND	ND	1	ND	3.6
5/10/2021	1.8	1.3	0.3	0.3	0.2	1.2
5/14/2021	1.5	1.8	ND	0.3	ND	20.7
5/19/2021	ND	0.4	ND	ND	ND	ND
5/24/2021	ND	ND	ND	ND	ND	ND
5/28/2021	ND	ND	ND	0.5	0.3	ND
6/2/2021	ND	void	0.3	ND	0.2	ND

Date	Edgard (µg/m³)	Entergy (µg/m³)	Hospital (µg/m³)	Levee (µg/m³)	Railroad (µg/m³)	Western (µg/m³)
6/7/2021	ND	ND	ND	ND	ND	ND
6/11/2021	ND	ND	14.3	ND	3.3	0.4
6/16/2021	1.8	ND	ND	1.6	ND	7
6/21/2021	0.3	0.4	2.8	1	2.7	1.2
6/25/2021	0.2	0.7	ND	0.5	0.2	1.7
6/30/2021	ND	2.4	0.5	10.7	0.3	0.6
7/5/2021		1.1	0.2	ND	0.3	ND
7/9/2021	0.6	0.4	0.2	0.6	0.2	1.1
7/14/2021	1.7	2.8	ND	0.3	ND	10.5
7/19/2021	ND	0.4	0.8	ND	1.2	ND
7/23/2021	ND	ND	ND	ND	ND	1.7
7/28/2021	1.8	ND	2	0.3	ND	1.1
8/2/2021	ND	ND	0.2	0.7	2.6	0.2
8/6/2021	0.2	0.4	1.1	6.8	2.5	15.4
8/11/2021	0.5	1.3	0.2	1.1	void	4.7
8/16/2021	ND	ND	14.9	1.8	16.8	0.8
8/21/2021	ND	ND	3.4	ND	4.7	ND
8/26/2021	0.6	0.8	0.3	4.9	0.2	12.2
8/31/2021	void	ND	ND	ND	ND	ND
9/3/2021	void	void	void	void	void	void
9/8/2021	void	void	void	void	void	void
9/14/2021	ND	0.2	ND	ND	ND	ND
9/17/2021	ND	ND	ND	ND	ND	ND
9/22/2021	ND	ND	ND	0.7	ND	4.6
9/27/2021	ND	24	ND	ND	ND	ND
10/1/2021	ND	ND	ND	ND	ND	2
10/6/2021	ND	ND	ND	ND	ND	1.4
10/12/2021	ND	ND	ND	ND	ND	ND
10/15/2021	ND	ND	ND	ND	ND	ND
10/20/2021	ND	ND	ND	ND	ND	ND
10/25/2021	ND	ND	ND	ND	ND	ND
10/29/2021	ND	ND	ND	ND	ND	ND
11/3/2021	ND	ND	ND	ND	ND	1.7
11/8/2021	ND	1.5	2.9	7.9	3.7	5.1
11/12/2021	ND	ND	ND	0.4	ND	ND
11/17/2021	0.3	0.7	ND	0.3	ND	1.5
11/22/2021	0.8	ND	ND	2.6	ND	2.5
11/26/2021	ND	ND	ND	1.5	ND	16.6
12/1/2021	ND	0.2	8.4	3.6	ND	0.4
12/6/2021	1.6	0.2	0.2	2.1	1.1	2.5
12/10/2021	ND	ND	0.7	ND	ND	ND
12/15/2021	ND	1.3	ND	ND	ND	ND
12/20/2021	ND	ND	ND	1.3	ND	3

Date	Edgard (µg/m^3)	Entergy (µg/m^3)	Hospital (µg/m^3)	Levee (µg/m^3)	Railroad (µg/m^3)	Western (µg/m^3)
12/24/2021	ND	ND	0.3	ND	0.2	ND
12/29/2021	ND	ND	0.3	ND	ND	ND
1/3/2022	1.2	0.4	0.4	3.7	ND	7.7
1/8/2022	ND	7.6	ND	ND	ND	ND
1/12/2022	ND	1.2	9.6	3.3	22.3	6
1/17/2022	1.6	11.8	ND	30.1	0.5	24.3
1/22/2022	ND	ND	ND	2.7	ND	0.5
1/26/2022	0.5	ND	ND	1.1	ND	5.7
1/31/2022	1	1.3	ND	ND	ND	1.7
2/4/2022	ND	ND	ND	6.4	ND	5.4
2/9/2022	ND	3.5	6.5	2.3	13.5	1.3
2/14/2022	0.6	0.3	0.7	1.2	0.4	2.2
2/18/2022	ND	ND	ND	0.9	ND	11.6
2/23/2022	ND	0.5	ND	ND	ND	ND
2/28/2022	ND	ND	ND	8.1	ND	0.9
3/4/2022	ND	3.2	ND	ND	ND	ND
3/9/2022	0.2	ND	ND	0.9	ND	7
3/14/2022	ND	1.2	ND	0.3	ND	0.2
3/18/2022	ND	0.2	ND	2.2	3.4	ND
3/23/2022	ND	ND	0.7	0.8	0.2	ND
3/28/2022	ND	0.2	0.4	ND	0.3	ND
4/1/2022	1.8	1.0	ND	0.2	ND	5.0
4/6/2022	ND	ND	ND	2.6	0.5	ND
4/11/2022	3.6	3.1	0.3	ND	ND	1.6
4/15/2022	ND	0.4	ND	ND	ND	ND
4/20/2022	ND	0.9	ND	ND	ND	ND
4/25/2022	ND	ND	ND	2.5	ND	4.7
4/29/2022	ND	2.3	ND	ND	ND	ND
5/4/2022	ND	ND	ND	ND	ND	ND
5/9/2022	ND	2.4	ND	ND	ND	ND
5/13/2022	ND	ND	ND	1.0	ND	ND
5/18/2022	ND	ND	0.6	ND	ND	ND
5/23/2022	ND	0.4	0.3	0.9	0.4	1.2
5/27/2022	ND	ND	ND	1.3	ND	2.2
6/1/2022	0.2	7.9	3.0	5.8	2.8	2.8
6/6/2022	ND	ND	ND	ND	ND	ND
6/10/2022	0.2	ND	0.3	4.1	1.1	26.5
6/15/2022	ND	ND	0.7	ND	1.0	ND
6/20/2022	ND	1.2	ND	1.0	ND	1.0
6/24/2022	ND	ND	0.5	ND	21.0	ND
6/29/2022	ND	0.6	ND	3.3	ND	0.8
7/4/2022	ND	ND	0.6	1.8	0.7	ND
7/8/2022	ND	ND	0.4	ND	1.4	ND

Date	Edgard ($\mu g/m^3$)	Entergy ($\mu g/m^3$)	Hospital ($\mu g/m^3$)	Levee ($\mu g/m^3$)	Railroad ($\mu g/m^3$)	Western ($\mu g/m^3$)
7/13/2022	ND	ND	0.2	0.2	ND	0.3
7/18/2022	ND	ND	2.6	void	0.2	ND
7/22/2022	0.2	0.7	0.8	3.4	0.8	2.4
7/27/2022	ND	0.2	1.3	1.9	1.1	1.9
8/1/2022	ND	1.3	0.5	1.0	0.4	1.2
8/5/2022	1.8	1.1	0.2	0.5	ND	16.3
8/10/2022	ND	1.7	ND	ND	ND	0.5
8/15/2022	ND	0.3	0.4	ND	2.6	ND
8/19/2022	ND	0.6	ND	0.3	ND	0.8
8/24/2022	ND	1.3	ND	ND	ND	ND
8/29/2022	1.5	1.0	1.6	3.9	0.4	5.5
9/1/2022	ND	2.2	0.9	9.1	6.5	4.8
9/7/2022	ND	ND	ND	0.9	0.9	0.3
9/12/2022	ND	ND	ND	0.8	ND	2.1
9/16/2022	1.9	1.8	ND	0.3	ND	7.7
9/21/2022	0.2	0.3	0.9	13.9	4.3	4.0
9/26/2022	ND	ND	ND	4.3	ND	12.2
9/30/2022	ND	ND	ND	11.9	ND	0.7
10/5/2022	ND	3.9	5.2	0.3	7.1	ND
10/10/2022	7.7	ND	ND	0.9	ND	118.0
10/14/2022	0.4	2.8	ND	ND	ND	1.7
10/19/2022	ND	ND	ND	1.2	0.3	ND
10/24/2022	ND	ND	ND	ND	ND	ND
10/28/2022	ND	ND	ND	ND	ND	0.6
11/2/2022	ND	1.1	ND	1.1	ND	0.5
11/7/2022	0.3	ND	ND	ND	ND	0.6
11/11/2022	ND	ND	0.9	0.8	0.8	ND
11/16/2022	ND	ND	ND	3.0	ND	0.2
11/21/2022	ND	ND	ND	1.0	ND	4.2
11/25/2022	0.4	ND	ND	2.9	ND	2.7
11/30/2022	ND	ND	ND	0.7	ND	3.8
12/5/2022	ND	ND	ND	ND	ND	ND
12/9/2022	ND	0.3	0.5	ND	1.7	0.2
12/14/2022	ND	ND	0.2	0.3	0.4	ND
12/19/2022	0.2	ND	ND	0.4	ND	2.4
12/23/2022	ND	ND	ND	5.5	ND	ND
12/28/2022	ND	1.1	ND	ND	ND	ND
1/2/2023	ND	ND	ND	ND	ND	ND
1/6/2023	0.2	9.0	ND	0.3	ND	0.8
1/11/2023	ND	ND	1.2	ND	0.2	ND
1/16/2023	ND	ND	0.8	ND	ND	ND
1/20/2023	0.3	ND	ND	ND	ND	3.3
1/25/2023	ND	ND	ND	0.5	ND	ND

Date	Edgard (µg/m³)	Entergy (µg/m³)	Hospital (µg/m³)	Levee (µg/m³)	Railroad (µg/m³)	Western (µg/m³)
1/30/2023	0.5	ND	0.3	0.2	0.3	1.9

Denka Active Monitor Results April 2, 2018 through January 30, 2023
Non-Detect values converted to MDL/2

Date	Edgard (µg/m³)	Entergy (µg/m³)	Hospital (µg/m³)	Levee (µg/m³)	Railroad (µg/m³)	Western (µg/m³)
4/2/2018	0.1	0.1	0.1	void	0.1	0.1
4/6/2018	0.1	0.1	0.1	0.1	0.3	0.1
4/11/2018	0.1	4.5	5.4	4.1	3	7.4
4/16/2018	void	0.1	39.1	0.1	13.7	0.1
4/20/2018	2.1	3.5	0.8	5.5	0.6	22.8
4/24/2018	0.1	0.1	0.1	6	2.4	0.4
4/27/2018	0.1	0.1	0.1	20.6	4.2	6.8
4/30/2018	0.1	0.2	0.1	0.1	0.1	0.1
5/4/2018	0.1	0.1	0.1	0.1	0.1	0.1
5/9/2018	0.1	11.2	0.2	0.1	0.1	0.1
5/14/2018	0.4	0.1	0.1	0.8	0.7	0.9
5/18/2018	0.1	0.5	0.4	0.2	1.1	0.2
5/23/2018	0.1	0.1	0.1	0.2	0.1	0.1
5/28/2018	0.1	0.1	0.1	2.6	0.1	1.9
6/1/2018	0.1	0.1	0.5	0.1	0.2	0.1
6/6/2018	0.1	0.1	47.1	63.7	40.2	32.1
6/11/2018	0.1	0.6	0.1		0.1	0.1
6/15/2018	0.1	4.6	0.1	0.8	0.1	4.1
6/20/2018	0.1	0.1	0.4	0.5	0.1	0.1
6/25/2018	0.1	0.1	1.2	0.8	1.4	0.5
6/29/2018	0.1	0.1	0.1	0.1	0.9	0.1
7/4/2018	0.1	0.1	0.1	0.8	0.1	0.1
7/9/2018	0.2	0.2	0.1	15.8	0.2	13.2
7/13/2018	0.1	0.1	0.6	0.1	2.4	0.1
7/18/2018	0.5	0.4	2	0.1	0.7	0.1
7/23/2018	0.1	0.2	0.1	0.1	3.3	1.3
7/27/2018	0.1	0.1	0.7	0.5	1.6	0.1
8/1/2018	0.1	0.1	void	1	void	0.7
8/6/2018	0.2	0.4	0.2	0.1	0.3	0.6
8/10/2018	0.1	0.1	0.6	0.3	3.3	0.1
8/15/2018	0.1	0.1	0.2	0.2	0.1	0.3
8/20/2018	0.1	0.1	1	0.1	0.5	0.1
8/24/2018	0.1		0.1	0.1	0.1	3.5
8/29/2018	0.1	0.1	0.1	0.1	0.1	0.5
9/4/2018	0.1	0.1	0.1	0.1	0.1	0.3
9/7/2018	0.1	0.1	0.1	1.8	0.1	3.1

Date	Edgard ($\mu g/m^3$)	Entergy ($\mu g/m^3$)	Hospital ($\mu g/m^3$)	Levee ($\mu g/m^3$)	Railroad ($\mu g/m^3$)	Western ($\mu g/m^3$)
9/12/2018	2	1.8	0.1	0.4	0.1	7.5
9/17/2018	0.1	0.6	20.2	5.8	31.9	0.1
9/21/2018	0.7	0.4	0.5	1	0.5	6.1
9/26/2018	0.1	0.1	0.4	0.1	1.2	0.1
10/1/2018	4.5	0.7	1.8	9	0.9	33.6
10/5/2018	0.1	0.3	0.1	0.1	0.1	0.1
10/9/2018	0.1	0.1	0.1	1.4	0.1	2.4
10/12/2018	1.7	2.8	34.9	81.5	41.6	13.8
10/17/2018	0.1	0.1	0.1	0.1	0.1	1.4
10/20/2018	0.1	0.1	0.1	0.2	0.1	0.1
10/24/2018	void	0.1	0.1	0.1	0.1	0.1
10/29/2018	0.1	1	3.8	0.2	0.9	1.1
11/2/2018	0.1	0.1	1.4	0.3	3.3	0.1
11/7/2018	0.1	0.1	0.1	0.5	0.1	1.8
11/12/2018	0.1	0.1	0.1	1.2	0.1	0.1
11/16/2018	0.6	1.2	9.1	4.2	4.2	17.8
11/20/2018	0.1	0.1	0.1	2.9	0.1	2.6
11/26/2018	0.1	0.1	0.1	4.1	0.1	0.4
12/1/2018	0.1	0.5	0.9	0.1	0.1	0.1
12/5/2018	1.3	0.1	0.1	0.4	0.1	9
12/10/2018	0.1	0.1	0.1	2.6	0.1	0.7
12/14/2018	0.1	0.1	0.1	0.1	2.6	0.1
12/19/2018	0.1	0.1	0.1	1.4	0.1	5.9
12/24/2018	4.3	0.1	0.1	0.1	0.1	5.4
12/28/2018	0.1	0.1	0.1	2.2	0.1	16.5
1/2/2019	1.6	0.1	0.1	10.9	0.1	5.4
1/7/2019	0.1	0.1	1.3	0.1	0.2	0.1
1/11/2019	2.1	2.8	0.1	0.1	0.1	2
1/16/2019	0.3	0.5	0.3	0.1		
1/18/2019					0.2	0.1
1/21/2019	0.2	0.2	0.1	0.1	0.1	0.1
1/25/2019	1.3	8	0.4	1.9	0.1	5.3
1/30/2019	1.4	1.7	0.1	0.2	0.1	2.2
2/4/2019	0.1	1.5	0.1	0.1	0.1	0.1
2/5/2019				0.5		
2/6/2019	0.1		0.1			
2/8/2019		0.1			0.1	7.5
2/13/2019	void	1.4	0.1	0.2	0.1	0.3
2/16/2019			0.1			
2/18/2019	0.3	0.1		0.1	0.1	2.1
2/22/2019	0.1	0.1	0.1	0.1	0.1	0.1
2/27/2019	0.1	0.6	2.4	0.1	0.1	0.1
3/4/2019	0.1	0.1	0.1	9.3	0.1	0.6

Date	Edgard (µg/m^3)	Entergy (µg/m^3)	Hospital (µg/m^3)	Levee (µg/m^3)	Railroad (µg/m^3)	Western (µg/m^3)
3/8/2019	0.1	2	0.1	0.1	0.1	0.1
3/13/2019	0.1	0.1	0.1	0.1	0.1	0.1
3/18/2019	0.3	0.1	0.1	0.1	0.1	12.6
3/22/2019	3.3	0.8	2.2	1.8	4.6	2.2
3/27/2019	2	2.4	7.1	10.8	3.3	8.2
4/1/2019	0.1	0.4	0.1	7.7	0.1	2.4
4/5/2019	0.5	2.7	0.1	0.1	0.1	1.6
4/10/2019	0.1	0.1	0.8	0.1	0.1	0.1
4/15/2019	0.1	0.9	2.5	0.2	0.9	0.1
4/19/2019	0.1	0.1	0.1	0.6	13	0.1
4/24/2019	0.1	16	0.6	0.1	0.1	0.1
4/29/2019	0.1	2.1	0.1	0.1	0.1	0.1
5/3/2019	0.4	2.2	0.4	0.1	0.6	0.1
5/7/2019	0.1	2.6	0.3	0.1	0.1	0.1
5/13/2019	0.1	0.1	0.1	15.3	0.1	11
5/17/2019	0.1	1.3	0.1	0.1	0.1	0.1
5/22/2019	0.4	0.3	0.1		0.1	0.7
5/27/2019	0.1	0.1	0.1	0.1	0.1	0.1
5/31/2019	0.1	0.1	1.3	0.1	3.4	0.1
6/5/2019	0.3	0.4	1.5	0.1	0.2	0.3
6/10/2019	0.1	0.1	0.1	29.5	0.1	5.4
6/14/2019	0.1	1.3	0.1	0.1	0.1	0.1
6/19/2019	0.1	0.1	1.6	0.1	1	0.1
6/23/2019			0.1			
6/24/2019	0.4	1.2	0.2	0.5	0.3	2.1
6/28/2019	0.1	0.3	0.1	2.4	0.3	5.8
7/3/2019	0.1	0.3	1.7	1.2	1.6	1.3
7/8/2019	0.1	0.1	0.3	0.6	3.7	0.1
7/15/2019	0.1	0.1	void	0.1	0.1	0.1
7/18/2019	0.1	1.3	4.8	0.3	1.2	0.1
7/22/2019	0.1	0.1	1.4	0.1	5.8	0.1
7/26/2019	0.1	0.4	0.1	0.1	0.1	0.1
7/31/2019	0.1	0.1	2.1	2.5	2.8	0.1
8/5/2019	0.1	0.1		0.1	4.6	0.1
8/9/2019	0.1	0.1	1.3	0.3	6.2	0.1
8/14/2019	0.1	0.1		1.6	0.7	4.2
8/19/2019	0.1	0.4		0.4	1.1	0.2
8/23/2019	0.1	0.1		0.9	0.1	2.7
8/28/2019	0.1	0.1	1.4	1.9	0.6	2.2
9/3/2019	0.1	0.1	1	5.6	1.4	2.4
9/6/2019	0.1	0.1	4.5	7.7	7.6	0.8
9/11/2019	0.1	2.3	0.1	3.1	0.1	2.2
9/16/2019	0.6	0.3	0.1	0.1	0.1	2.1

Date	Edgard (μg/m^3)	Entergy (μg/m^3)	Hospital (μg/m^3)	Levee (μg/m^3)	Railroad (μg/m^3)	Western (μg/m^3)
9/20/2019	0.3	0.1	0.1	0.1	0.1	0.1
9/25/2019	0.1	0.3	0.8	1.7	5	0.1
9/30/2019	1.1	7.7	0.1	0.2	0.1	11.4
10/4/2019	0.3	0.1	0.1	0.7	0.1	3.9
10/9/2019	1.6	1.1	0.2	0.5	0.1	20.9
10/14/2019	0.4	0.1	0.1	1.7	0.1	1.2
10/18/2019	0.1	0.1	0.1	1.1	0.1	3.9
10/23/2019	2.4	0.1	0.1	2.4	0.1	17.5
10/28/2019	0.1	0.1	0.1	0.4	0.1	0.4
11/1/2019	0.1	0.1	0.1	0.5	0.1	0.1
11/6/2019	0.1	0.1	0.1	0.1	0.1	0.1
11/11/2019	0.1	0.1	0.1	0.1	0.1	0.1
11/15/2019	0.1	0.1	0.1	30	0.1	0.1
11/20/2019	3.4	1.1	0.1	0.1	0.1	4.4
11/25/2019	0.1	4.2	0.1	0.1	0.1	0.1
11/29/2019	0.9	1.6	0.1	0.1	0.1	0.1
12/4/2019	2.5	0.1	0.1	33.1	0.1	58.7
12/9/2019	0.1	0.1	0.3	0.1	0.1	0.1
12/13/2019	0.3	1	1.1	3.5	1.2	3.4
12/18/2019	0.1	0.1	0.1	2.6	0.1	1.9
12/23/2019	0.1	0.1	0.1	3.5	0.1	0.1
12/27/2019	1.3	0.1	0.1	0.1	0.1	0.1
1/1/2020	0.2	0.4	0.1	0.1	0.1	0.3
1/6/2020	0.1	0.1	0.5	0.7	0.1	0.1
1/10/2020	0.1	0.4	0.1	0.1	0.1	0.1
1/15/2020	3.7	3.5	0.1	1.6	0.3	2.8
1/20/2020	0.1	0.1	0.1	3	0.1	0.5
1/24/2020	0.2	0.1	0.1	1.2	0.1	0.1
1/29/2020	0.3	0.1	0.1	0.3	0.1	1.2
2/3/2020	0.1	0.9	0.2	0.1	0.1	0.1
2/7/2020	0.1	0.1	0.2	0.1	0.1	0.1
2/12/2020	0.1	0.1	0.3	0.1	0.1	0.1
2/17/2020	void	4.9	0.1	0.1	0.1	0.1
2/21/2020	0.1	0.1	0.1	1.1	0.1	7.8
2/26/2020	0.1	0.1	0.1	4.3	0.1	0.1
3/2/2020	0.1	0.1	0.6	0.1	0.1	0.1
3/6/2020	0.1	0.1	0.1	0.5	0.1	0.5
3/11/2020	0.1	0.1	0.5	0.1	0.2	0.1
3/16/2020	0.1	0.3	0.1	0.3	0.1	0.3
3/20/2020	0.1	0.1	0.1	0.7	0.1	3.1
3/25/2020	0.1	0.1	2	0.1	1.1	0.1
3/30/2020	0.1	0.3	0.1	0.1	0.1	0.1
4/3/2020	2.2	1	0.1	0.8	0.1	1.7

Date	Edgard ($\mu g/m^3$)	Entergy ($\mu g/m^3$)	Hospital ($\mu g/m^3$)	Levee ($\mu g/m^3$)	Railroad ($\mu g/m^3$)	Western ($\mu g/m^3$)
4/8/2020	0.1	0.1	1.1	0.1	2	0.1
4/13/2020	0.1	0.1	0.1	4.2	0.1	4.9
4/17/2020	0.1	1.2	0.1	0.9	0.1	0.1
4/22/2020	0.1	0.2	0.5	0.1	0.1	0.1
4/27/2020	0.1	0.3	0.1	0.1	0.1	2.2
5/1/2020	0.1	1.3	1.3	0.4	0.6	0.3
5/6/2020	0.2	0.1	0.1	2.9	0.1	1.1
5/11/2020	0.8	0.6	0.1	0.1	0.1	9.6
5/15/2020	0.1	0.5	0.1	0.1	0.1	0.1
5/20/2020	0.1	0.7	0.1	0.1	0.1	0.2
5/24/2020	0.1	0.3	0.1	0.1	0.1	0.1
5/29/2020	0.2	0.1	1	5	0.8	4.9
6/3/2020	0.1	0.4	0.1	0.3	0.1	0.3
6/8/2020	0.1	0.1	0.1	0.1	0.1	0.1
6/12/2020	0.1	0.1	0.1	0.5	0.1	0.1
6/17/2020	0.1	0.2	0.3	1.4	0.2	0.1
6/22/2020	0.1	0.1	0.1	0.1	0.1	0.1
6/26/2020	0.1	0.1	0.1	0.1	0.1	0.1
7/1/2020	0.1	0.1	1.3	0.1	1.8	0.1
7/6/2020	void	0.1	0.5	0.1	0.1	0.1
7/10/2020	0.1	0.1	0.1	0.1	0.1	0.1
7/15/2020	0.1	0.1	0.1	0.1	0.1	0.1
7/20/2020	0.1	0.1	0.1	0.1	0.1	0.1
7/24/2020	0.1	0.1	0.1	0.1	0.1	0.1
7/29/2020	0.1	0.1	1.4	0.1	1.9	0.1
8/3/2020	0.1	0.1	0.8	2.5	3.8	0.1
8/7/2020	0.1	0.6	1.1	5.6	1.6	0.5
8/12/2020	0.1	0.1	0.5	0.2	0.8	0.1
8/17/2020	0.1	0.1	0.1	2.9	0.1	1
8/21/2020	0.1	0.3	0.1	0.3	0.1	0.1
8/26/2020	0.1	1.6	0.1	0.1	0.1	0.1
8/31/2020	0.1	0.5	0.2	0.1	0.7	0.1
9/4/2020	0.1	0.1	0.4	7.2	0.3	0.7
9/9/2020	1.3	0.1	0.1	6.1	0.1	6.2
9/15/2020	0.1	0.1	0.1	2.1	0.1	0.1
9/19/2020	0.2	0.1	0.1	0.1	0.1	0.1
9/23/2020	0.1	0.4	0.1	0.1	3	0.1
9/28/2020	0.1	0.1	0.1	3.8	0.3	0.4
10/2/2020	0.9	0.1	0.3	1.6	0.7	3
10/7/2020	3.6	0.1	2.2	0.1	0.1	5.3
10/12/2020	0.1	0.1	0.1	0.5	1.3	0.5
10/16/2020	0.5	0.1	0.1	0.1	0.1	3.7
10/21/2020	1.3	0.1	0.1	0.1	0.1	0.8

Date	Edgard ($\mu g/m^3$)	Entergy ($\mu g/m^3$)	Hospital ($\mu g/m^3$)	Levee ($\mu g/m^3$)	Railroad ($\mu g/m^3$)	Western ($\mu g/m^3$)
10/26/2020	0.9	0.1	0.1	1.2	0.1	2.8
10/30/2020	0.1	0.1	0.1	void	0.1	12.6
11/4/2020	0.7	0.1	0.1	2.7	0.1	5.8
11/9/2020	void	0.1	0.1	0.1	0.1	2.2
11/13/2020	6.4	8.9	0.1	0.1	0.1	10.7
11/18/2020	3.2	0.1	0.1	7.2	0.1	28.9
11/23/2020	0.9	0.1	0.1	0.4	0.1	2.2
11/27/2020	0.1	0.1	0.1	2	0.3	1.2
12/2/2020	0.3	0.1	0.1	0.1	0.1	1.2
12/7/2020	0.1	0.1	0.9	8	2.3	1.8
12/11/2020	0.1	0.1	0.8	0.6	1.7	0.3
12/16/2020	0.1	0.1	0.1	4.2	0.1	0.1
12/21/2020	0.1	0.1	8.7	2.8	3.7	1.1
12/26/2020	1.3	3.3	0.1	0.3	0.1	3.1
12/30/2020	0.1	0.9	0.1	0.1	0.1	0.1
1/4/2021	0.1	0.1	0.4	1.7	0.4	1.1
1/8/2021	0.1	0.1	0.1	6.6	0.1	0.1
1/13/2021	0.1	0.1	2.5	0.1	2	0.1
1/17/2021	0.1	6.2	20.2	19.2	36.9	8
1/22/2021	0.1	0.1	0.1	0.1	0.1	0.3
1/27/2021	0.1	0.1	0.1	0.8	0.1	0.3
2/1/2021	0.1	0.1	0.1	0.3	0.1	0.1
2/5/2021	0.8	0.1	0.1	0.1	0.1	0.3
2/10/2021	1.4	0.5	0.1	0.1	0.1	0.5
2/16/2021	0.1	0.1	0.1	1.3	0.1	8.8
2/19/2021	0.1	0.1	0.1	13.1	0.1	0.2
2/24/2021	0.1	0.5	0.3	1.1	0.2	0.3
3/1/2021	0.1	0.1	0.1	0.4	0.1	4.6
3/5/2021	0.7	0.1	0.1	0.8	0.1	3.4
3/10/2021	0.1	5.9	0.1	0.1	0.1	0.1
3/15/2021	0.1	0.5	1.2	0.1	0.1	0.1
3/19/2021	0.1	0.1	0.1	3.9	0.1	2.4
3/24/2021	0.4	0.1	0.1	0.1	0.1	0.4
3/29/2021	0.1	2.8	0.1	0.1	0.1	0.1
4/2/2021	1.1	22.8	6.7	10.1	5.5	8.5
4/7/2021	0.1	0.1	0.5	0.6	0.2	0.1
4/12/2021	0.3	0.8	0.1	0.1	0.1	0.1
4/16/2021	0.4	0.1	0.1	0.1	0.1	0.9
4/21/2021	0.9	0.1	0.1	2.8	0.1	4.9
4/26/2021	0.1	3.6	0.1	0.1	0.1	0.1
5/1/2021	0.1	0.3	0.4	0.1	0.1	0.1
5/5/2021	0.1	0.1	0.1	1	0.1	3.6
5/10/2021	1.8	1.3	0.3	0.3	0.2	1.2

Date	Edgard (µg/m^3)	Entergy (µg/m^3)	Hospital (µg/m^3)	Levee (µg/m^3)	Railroad (µg/m^3)	Western (µg/m^3)
5/14/2021	1.5	1.8	0.1	0.3	0.1	20.7
5/19/2021	0.1	0.4	0.1	0.1	0.1	0.1
5/24/2021	0.1	0.1	0.1	0.1	0.1	0.1
5/28/2021	0.1	0.1	0.1	0.5	0.3	0.1
6/2/2021	0.1	void	0.3	0.1	0.2	0.1
6/7/2021	0.1	0.1	0.1	0.1	0.1	0.1
6/11/2021	0.1	0.1	14.3	0.1	3.3	0.4
6/16/2021	1.8	0.1	0.1	1.6	0.1	7
6/21/2021	0.3	0.4	2.8	1	2.7	1.2
6/25/2021	0.2	0.7	0.1	0.5	0.2	1.7
6/30/2021	0.1	2.4	0.5	10.7	0.3	0.6
7/5/2021		1.1	0.2	0.1	0.3	0.1
7/9/2021	0.6	0.4	0.2	0.6	0.2	1.1
7/14/2021	1.7	2.8	0.1	0.3	0.1	10.5
7/19/2021	0.1	0.4	0.8	0.1	1.2	0.1
7/23/2021	0.1	0.1	0.1	0.1	0.1	1.7
7/28/2021	1.8	0.1	2	0.3	0.1	1.1
8/2/2021	0.1	0.1	0.2	0.7	2.6	0.2
8/6/2021	0.2	0.4	1.1	6.8	2.5	15.4
8/11/2021	0.5	1.3	0.2	1.1	void	4.7
8/16/2021	0.1	0.1	14.9	1.8	16.8	0.8
8/21/2021	0.1	0.1	3.4	0.1	4.7	0.1
8/26/2021	0.6	0.8	0.3	4.9	0.2	12.2
8/31/2021	void	0.1	0.1	0.1	0.1	0.1
9/3/2021	void	void	void	void	void	void
9/8/2021	void	void	void	void	void	void
9/14/2021	0.1	0.2	0.1	0.1	0.1	0.1
9/17/2021	0.1	0.1	0.1	0.1	0.1	0.1
9/22/2021	0.1	0.1	0.1	0.7	0.1	4.6
9/27/2021	0.1	24	0.1	0.1	0.1	0.1
10/1/2021	0.1	0.1	0.1	0.1	0.1	2
10/6/2021	0.1	0.1	0.1	0.1	0.1	1.4
10/12/2021	0.1	0.1	0.1	0.1	0.1	0.1
10/15/2021	0.1	0.1	0.1	0.1	0.1	0.1
10/20/2021	0.1	0.1	0.1	0.1	0.1	0.1
10/25/2021	0.1	0.1	0.1	0.1	0.1	0.1
10/29/2021	0.1	0.1	0.1	0.1	0.1	0.1
11/3/2021	0.1	0.1	0.1	0.1	0.1	1.7
11/8/2021	0.1	1.5	2.9	7.9	3.7	5.1
11/12/2021	0.1	0.1	0.1	0.4	0.1	0.1
11/17/2021	0.3	0.7	0.1	0.3	0.1	1.5
11/22/2021	0.8	0.1	0.1	2.6	0.1	2.5
11/26/2021	0.1	0.1	0.1	1.5	0.1	16.6

Date	Edgard (µg/m3)	Entergy (µg/m3)	Hospital (µg/m3)	Levee (µg/m3)	Railroad (µg/m3)	Western (µg/m3)
12/1/2021	0.1	0.2	8.4	3.6	0.1	0.4
12/6/2021	1.6	0.2	0.2	2.1	1.1	2.5
12/10/2021	0.1	0.1	0.7	0.1	0.1	0.1
12/15/2021	0.1	1.3	0.1	0.1	0.1	0.1
12/20/2021	0.1	0.1	0.1	1.3	0.1	3
12/24/2021	0.1	0.1	0.3	0.1	0.2	0.1
12/29/2021	0.1	0.1	0.3	0.1	0.1	0.1
1/3/2022	1.2	0.4	0.4	3.7	0.1	7.7
1/8/2022	0.1	7.6	0.1	0.1	0.1	0.1
1/12/2022	0.1	1.2	9.6	3.3	22.3	6
1/17/2022	1.6	11.8	0.1	30.1	0.5	24.3
1/22/2022	0.1	0.1	0.1	2.7	0.1	0.5
1/26/2022	0.5	0.1	0.1	1.1	0.1	5.7
1/31/2022	1	1.3	0.1	0.1	0.1	1.7
2/4/2022	0.1	0.1	0.1	6.4	0.1	5.4
2/9/2022	0.1	3.5	6.5	2.3	13.5	1.3
2/14/2022	0.6	0.3	0.7	1.2	0.4	2.2
2/18/2022	0.1	0.1	0.1	0.9	0.1	11.6
2/23/2022	0.1	0.5	0.1	0.1	0.1	0.1
2/28/2022	0.1	0.1	0.1	8.1	0.1	0.9
3/4/2022	0.1	3.2	0.1	0.1	0.1	0.1
3/9/2022	0.2	0.1	0.1	0.9	0.1	7
3/14/2022	0.1	1.2	0.1	0.3	0.1	0.2
3/18/2022	0.1	0.2	0.1	2.2	3.4	0.1
3/23/2022	0.1	0.1	0.7	0.8	0.2	0.1
3/28/2022	0.1	0.2	0.4	0.1	0.3	0.1
4/1/2022	1.8	1.0	0.1	0.2	0.1	5.0
4/6/2022	0.1	0.1	0.1	2.6	0.5	0.1
4/11/2022	3.6	3.1	0.3	0.1	0.1	1.6
4/15/2022	0.1	0.4	0.1	0.1	0.1	0.1
4/20/2022	0.1	0.9	0.1	0.1	0.1	0.1
4/25/2022	0.1	0.1	0.1	2.5	0.1	4.7
4/29/2022	0.1	2.3	0.1	0.1	0.1	0.1
5/4/2022	0.1	0.1	0.1	0.1	0.1	0.1
5/9/2022	0.1	2.4	0.1	0.1	0.1	0.1
5/13/2022	0.1	0.1	0.1	1.0	0.1	0.1
5/18/2022	0.1	0.1	0.6	0.1	0.1	0.1
5/23/2022	0.1	0.4	0.3	0.9	0.4	1.2
5/27/2022	0.1	0.1	0.1	1.3	0.1	2.2
6/1/2022	0.2	7.9	3.0	5.8	2.8	2.8
6/6/2022	0.1	0.1	0.1	0.1	0.1	0.1
6/10/2022	0.2	0.1	0.3	4.1	1.1	26.5
6/15/2022	0.1	0.1	0.7	0.1	1.0	0.1

Date	Edgard (µg/m³)	Entergy (µg/m³)	Hospital (µg/m³)	Levee (µg/m³)	Railroad (µg/m³)	Western (µg/m³)
6/20/2022	0.1	1.2	0.1	1.0	0.1	1.0
6/24/2022	0.1	0.1	0.5	0.1	21.0	0.1
6/29/2022	0.1	0.6	0.1	3.3	0.1	0.8
7/4/2022	0.1	0.1	0.6	1.8	0.7	0.1
7/8/2022	0.1	0.1	0.4	0.1	1.4	0.1
7/13/2022	0.1	0.1	0.2	0.2	0.1	0.3
7/18/2022	0.1	0.1	2.6	void	0.2	0.1
7/22/2022	0.2	0.7	0.8	3.4	0.8	2.4
7/27/2022	0.1	0.2	1.3	1.9	1.1	1.9
8/1/2022	0.1	1.3	0.5	1.0	0.4	1.2
8/5/2022	1.8	1.1	0.2	0.5	0.1	16.3
8/10/2022	0.1	1.7	0.1	0.1	0.1	0.5
8/15/2022	0.1	0.3	0.4	0.1	2.6	0.1
8/19/2022	0.1	0.6	0.1	0.3	0.1	0.8
8/24/2022	0.1	1.3	0.1	0.1	0.1	0.1
8/29/2022	1.5	1.0	1.6	3.9	0.4	5.5
9/1/2022	0.1	2.2	0.9	9.1	6.5	4.8
9/7/2022	0.1	0.1	0.1	0.9	0.9	0.3
9/12/2022	0.1	0.1	0.1	0.8	0.1	2.1
9/16/2022	1.9	1.8	0.1	0.3	0.1	7.7
9/21/2022	0.2	0.3	0.9	13.9	4.3	4.0
9/26/2022	0.1	0.1	0.1	4.3	0.1	12.2
9/30/2022	0.1	0.1	0.1	11.9	0.1	0.7
10/5/2022	0.1	3.9	5.2	0.3	7.1	0.1
10/10/2022	7.7	0.1	0.1	0.9	0.1	118.0
10/14/2022	0.4	2.8	0.1	0.1	0.1	1.7
10/19/2022	0.1	0.1	0.1	1.2	0.3	0.1
10/24/2022	0.1	0.1	0.1	0.1	0.1	0.1
10/28/2022	0.1	0.1	0.1	0.1	0.1	0.6
11/2/2022	0.1	1.1	0.1	1.1	0.1	0.5
11/7/2022	0.3	0.1	0.1	0.1	0.1	0.6
11/11/2022	0.1	0.1	0.9	0.8	0.8	0.1
11/16/2022	0.1	0.1	0.1	3.0	0.1	0.2
11/21/2022	0.1	0.1	0.1	1.0	0.1	4.2
11/25/2022	0.4	0.1	0.1	2.9	0.1	2.7
11/30/2022	0.1	0.1	0.1	0.7	0.1	3.8
12/5/2022	0.1	0.1	0.1	0.1	0.1	0.1
12/9/2022	0.1	0.3	0.5	0.1	1.7	0.2
12/14/2022	0.1	0.1	0.2	0.3	0.4	0.1
12/19/2022	0.2	0.1	0.1	0.4	0.1	2.4
12/23/2022	0.1	0.1	0.1	5.5	0.1	0.1
12/28/2022	0.1	1.1	0.1	0.1	0.1	0.1
1/2/2023	0.1	0.1	0.1	0.1	0.1	0.1

Date	Edgard ($\mu g/m^3$)	Entergy ($\mu g/m^3$)	Hospital ($\mu g/m^3$)	Levee ($\mu g/m^3$)	Railroad ($\mu g/m^3$)	Western ($\mu g/m^3$)
1/6/2023	0.2	9.0	0.1	0.3	0.1	0.8
1/11/2023	0.1	0.1	1.2	0.1	0.2	0.1
1/16/2023	0.1	0.1	0.8	0.1	0.1	0.1
1/20/2023	0.3	0.1	0.1	0.1	0.1	3.3
1/25/2023	0.1	0.1	0.1	0.5	0.1	0.1
1/30/2023	0.5	0.1	0.3	0.2	0.3	1.9

EXHIBIT C

U.S. Memorandum in Support of Motion for Preliminary Injunction (DN 9-2), *United States v. Denka Performance Elastomer, LLC, et al.*, No. 23-cv-735 (E.D. La. March 20, 2023)

IN THE UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF LOUISIANA

UNITED STATES OF AMERICA Plaintiff, v. DENKA PERFORMANCE ELASTOMER, LLC and DUPONT SPECIALTY PRODUCTS USA, LLC. Defendants.	Civil Action No. 2:23-cv-735 Judge Barbier (Section J) Magistrate Judge North

MEMORANDUM IN SUPPORT OF THE UNITED STATES' MOTION FOR A PRELIMINARY INJUNCTION AGAINST DENKA PERFORMANCE ELASTOMER, LLC

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INTRODUCTION

Every day, thousands of people living in St. John the Baptist Parish breathe the carcinogenic chloroprene emitted from Denka's Neoprene manufacturing operations in LaPlace, Louisiana (the "Facility"). Chloroprene – a hazardous air pollutant under the Clean Air Act and key chemical ingredient for making Neoprene – is a likely, potent "mutagenic" carcinogen. Meaning, when a person breathes chloroprene, it causes DNA mutations in the body's cells. That genetic damage increases the risk of developing potentially fatal cancers, such as lung and liver cancer. The DNA-damaging effects of breathing chloroprene are particularly grave for the still-developing bodies of infants and children. Young people accumulate cancer risks more rapidly than adults, their bodies are less able to repair the genetic damage breathing chloroprene causes, and exposure-related tumors often have shorter latency periods in children than adults—all of which means that children are especially vulnerable to the health risks the Facility poses.

Denka's Facility is the Parish's sole source of chloroprene emissions. These emissions are exposing infants, children, and adults in nearby communities, such as LaPlace, Reserve, and Edgard, Louisiana, to some of the country's highest cancer risks from industrial air pollution. Given their magnitude and the rate at which they are accumulating, these cancer risks constitute an imminent and substantial endangerment to the public health and welfare of Parish residents.

42 U.S.C. § 7603's unmistakably clear text empowers this Court to immediately stop endangerments to public health and welfare caused by air pollution like Denka's carcinogenic chloroprene emissions. This authority, which is intended to prevent harm to public health *before* it actually comes to pass, reigns supreme in the Clean Air Act: the Court is authorized to immediately act "[n]otwithstanding any other provision of [the Act]."

The dangers that Denka's chloroprene emissions present warrant such immediate action. People breathing chloroprene at the levels regularly detected in the communities closest to

Denka's Facility – including near homes and an elementary school – will reach and exceed the EPA's and other United States regulatory agencies' presumptive upper threshold for so-called "acceptable" lifetime excess cancer risk within a handful of years. This threshold is generally expressed as a 1-in-10,000 risk accumulated over the span of an assumed *70-year* lifetime.

Results from multiple air monitoring systems, including a system installed and operated by Denka itself, consistently show long-term average airborne chloroprene concentrations in residential areas closest to the Facility that are more than *fourteen times* greater than 0.2 micrograms of chloroprene per cubic meter of air (0.2 $\mu g/m^3$). A person may breathe no more than an average chloroprene concentration of 0.2 $\mu g/m^3$ over 70 years in order to remain below a 1-in-10,000 lifetime excess cancer risk. Breathing higher average concentrations causes the associated risks to accumulate faster.

For infants (< 2 years old) and children (< 16 years old) living near Denka's Facility, these monitoring results mean that their lifetime excess cancer risk threshold is crossed far sooner than 70 years. Infants who are born today and consistently breathe chloroprene concentrations that average fourteen times greater than 0.2 $\mu g/m^3$ are expected to suffer enough genetic damage to cause double their estimated *lifetime* acceptable excess cancer risk (*i.e.*, 2-in-10,000) by their second birthday – *i.e.*, *68 years sooner* than they should suffer from half as much risk. That risk continues to climb as people breathe more of Denka's chloroprene, ultimately reaching more than fourteen times greater than the 1-in-10,000 benchmark over a 70-year lifetime.

The United States' requested preliminary injunction will begin to abate these unacceptably high cancer risks. *See* Ex. A (Proposed Preliminary Injunction Order). Under the proposed injunction, Denka must perform a series of specific, near-term actions to immediately reduce the Facility's chloroprene emissions. Denka must also begin planning for the long-term actions the United States will seek as permanent injunctive relief. These actions, all of which are technically feasible and reasonable, are intended to make immediate, measurable progress toward reducing chloroprene related cancer risks from the Facility. Unless Denka completes these actions, it must immediately cease chloroprene and Neoprene production at the Facility.

The Court should grant the requested preliminary injunction and order Denka to take these steps.

BACKGROUND

Factual Background

A. Thousands of People Live Near Denka's Facility and Breathe its Chloroprene Emissions

Thousands of people, including young children, live near Denka's Facility. *See generally* Ex. C, Decl. of Dr. Nyesha Black. Approximately 15,000 to 17,000 people live within 2.5 miles of the Facility's center. *See id.* ¶¶s 22 and 29. Over 20% of that population (roughly 3,000-4,000) is under the age of 18. *See id.* ¶¶s 32, 35, and 42. Of those 3,000-4,000 young people, approximately 800-1,000 are young children under the age of 5. *See id.* ¶¶s 32, 37, and 42.

Parish residents living as far as 2.5 miles away from Denka's Facility are consistently exposed to chloroprene concentrations that regularly exceed 0.2 $\mu g/m^3$.[1] *See* Ex. D, Decl. of Dr. John Vandenberg ¶¶s 35, 39–43, Attach. 3 and 4, and Ex. E (Table of 24-hour Canister Air Monitoring Results). And many people have lived near the Facility for decades. *See* Ex. C ¶¶s 49 and 50. Chloroprene emissions drift across the Facility's fenceline and reach the nearby residential neighborhoods, schools, and a hospital. *See id.* ¶¶s 15-19 and 21; *see also* Ex. D

[1] Because concentrations of airborne chloroprene generally increase with proximity to Denka's Facility, so do the cancer risks associated with exposure. *See* Ex. E.

¶¶s 34-35. People inevitably breathe these emissions, allowing chloroprene to enter their bodies. *See* Ex. D ¶ 9 and Ex. F, Decl. of Dr. Ila Cote ¶¶s 15 and 44. Chloroprene metabolites have been detected in urine samples given by Parish residents. *See* Ex. F ¶ 44.

Some of the highest chloroprene concentrations detected by ongoing air monitoring are near homes and a local elementary school. *See* Ex. D ¶¶s 43, 45, and Attach. 4 and Ex. E. Roughly 300 kindergarteners through fourth graders attend the Fifth Ward Elementary School, which is only about 450 feet away from the Facility's western fenceline. *See* Ex. C ¶ 45 and Ex. E. East St. John High School, where about 1,200 students go to school, is roughly a mile-and-a-half north of Denka's Facility. *See* Ex. C ¶ 44. Some of these students live in the communities surrounding Denka's Facility and continue to be exposed to its chloroprene emissions even after they go home. *See id*. ¶¶s 44-45; *see also* Ex. D ¶¶s 35 and 43.

B. <u>The Facility's Operations Produce Carcinogenic Chloroprene Emissions</u>

Chloroprene is a liquid chemical used to produce the stretchy, synthetic rubber Neoprene. *See* Ex. D ¶¶s 8–9. Chloroprene is also a statutorily designated hazardous air pollutant.[2] *See* 42 U.S.C. § 7412(b)(1). Congress listed the air pollutants in 42 U.S.C. § 7412(b)(1) because of their "potential for adverse health effects to occur in exposed populations." *See* H. Rep. No. 101-490 (Part I), at 325 (1990); *see also* Ex. F ¶¶s 2 and 48 (explaining that chloroprene is a likely, potent carcinogen).

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[2] Chloroprene readily evaporates at room temperature. *See* Ex. G ¶ 16, Decl. of Jeffrey R. Harrington. It is produced using other toxic ingredients, including 1,3-butadiene and chlorine. *See id.* ¶ 15; *see also* 42 U.S.C. § 7412(b)(1) (listing 1,3-butadiene and chlorine as hazardous air pollutants).

There is only one known chloroprene source in all of St. John the Baptist Parish: Denka's Facility, which is located within the fenceline of the 1,100-acre Pontchartrain Works Site.[3] *See* Ex. D ¶ 13. Chloroprene is routinely emitted into the air at various stages of Denka's Neoprene manufacturing operations. *See* Ex. G ¶ 23; *see also* Ex. I ¶ 22, Decl. of Nicholas Bobbs. It is emitted through vents from the manufacturing equipment that discharge directly to the atmosphere. *See* Ex. G ¶¶s 23-24; Ex. I ¶ 22. It is emitted when tanks and other process vessels are opened, during normal operations and maintenance work. *See* Ex. G ¶ 25; Ex. I ¶ 23. It is also emitted through more diffuse ("fugitive") sources, like equipment leaks and evaporative emissions from wastewater generated during Neoprene manufacturing. *See* Ex. G ¶¶s 25-26 and 29; Ex. I ¶¶s 24-25.

C. <u>Chloroprene is a potent, likely human carcinogen</u>

Breathing chloroprene increases the risk of developing potentially fatal cancers, such as lung and liver cancer. *See* Ex. F ¶ 42; *see also* Ex. H, Decl. of Dr. Helen H. Suh ¶¶s 32, 36, 42, and 46, and Ex. D ¶¶s 20–22. Chloroprene creates this risk because of its mutagenic mode of action. *See* Ex. F ¶¶s 34–36; *see also* Ex. D ¶ 22.

Infants and children younger than 16 are likely to be especially susceptible to the cancer-causing effects of mutagens like chloroprene. *See* Ex. F ¶¶s 39–41; *see also* Ex. D ¶¶s 22–23 and 64–66. This is because our cells divide and replicate more rapidly when we are younger,

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[3] E.I. du Pont de Nemours & Co., Inc. and its predecessors-in-interest (collectively "E.I. DuPont") ran the Neoprene manufacturing operations for many years before selling them to Denka as part of a major corporate restructuring in 2014 and 2015. *See* Ex. D ¶ 10. E.I. DuPont, however, retained ownership of the land underneath the entire Pontchartrain Works Site and became Denka's landlord pursuant to a 99-year "Ground Lease." *See* Ex. L, ¶¶s 1-3. Defendant DuPont Specialty Products USA LLC ("DuPont Specialty Products") now owns the Pontchartrain Works Site's land. DuPont Specialty Products is a required party under Fed. R. Civ. P. 19(a) because Denka may need DuPont Specialty Products' permission under the Ground Lease in order to comply with any Court-ordered relief.

leaving less time for the body to repair DNA mutations before the damaged cells replicate. *See* Ex. F ¶ 41. The more rapid replication of mutated cells increases the risk of developing cancer. *See id*. Infants and children are also more susceptible to chloroprene's cancer-causing risks for physiological reasons. *See id*. Because of their smaller, still-developing bodies, they will likely have higher and more persistent blood concentrations of chloroprene or its metabolites than adults exposed to the same air concentrations of chloroprene. *See id*. And cancers in children often present with shorter latency periods, meaning exposure-related tumors are expected to appear sooner than in comparably exposed adults. *See id*. Chloroprene exposure during a person's early years is therefore particularly harmful. *See id*.

The EPA determined that chloroprene is a likely human carcinogen, and that it acts through a mutagenic mode of action, in its peer-reviewed 2010 Integrated Risk Information System assessment of chloroprene (the "2010 IRIS Assessment"). *See* Ex. F ¶¶s 2 and 45–54; *see also* Ex. D ¶¶s 19–24. IRIS assessments identify the types of human health hazards – such as the risk of developing cancer – that exposure to a particular chemical may cause. *See* Ex. F ¶ 46. The EPA then quantifies the correlation between exposure to the chemical and the related health hazards to arrive at a numerical estimate of its carcinogenic potency.[4] *See id*. ¶ 49.

For the relevant health effects of breathing chloroprene, the EPA determined that the average concentration of chloroprene a person may regularly breathe over a 70-year lifetime without being expected to exceed a 1-in-10,000 risk of contracting chloroprene-linked cancers is 0.2 $\mu g/m^3$.[5] *See* Ex. D ¶ 43, n.23 and ¶ 70 and Ex. F ¶ 51, Table 1.

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[4] The "inhalation unit risk estimate" is the technical term for EPA's human cancer potency estimate associated with breathing chloroprene. *See* Ex. D, ¶ 21.

[5] The EPA uses a 70-year timeframe for determining an acceptable "lifetime" cancer risk. *See* Ex. D ¶¶s 23, 54, and 56.

IRIS assessments are extensively peer-reviewed by experts inside and outside of the United States government, and are recognized as the gold standard for chemical assessments for cancer risks. *See Nat'l Oilseed Processors Ass'n v. Browner*, 924 F. Supp. 1193, 1199-1200 n.9 (D.D.C. 1996) (IRIS assessments offer "comprehensive hazard assessments conducted by panels of senior EPA scientists"); *see also* Ex. F ¶ 46. Although IRIS assessments and their conclusions are not law, courts recognize that IRIS assessments, because of the rigorous vetting process, are "generally accepted as a reliable source of information on the potential hazardous effects of those chemicals that are included in IRIS." *Nat'l Oilseed Processors Ass'n*, 924 F. Supp. at 1200; *see also Leese v. Martin*, Civ. No. 11-5091, 2012 WL 1224573, at *1 n.2 (D.N.J. 2012) (taking judicial notice of the trichloroethylene IRIS assessment and suggesting, by reference to Fed. R. Evid. 201(b), that it is a source whose accuracy cannot reasonably be questioned). The EPA and other agencies rely on IRIS assessments as a thoroughly vetted scientific foundation for chemical regulations and other health risk-based decisions. *See* Ex. F ¶ 46.

The 2010 IRIS Assessment was based on a comprehensive review of the available evidence on chloroprene toxicity, including animal toxicology data, evidence of chloroprene's mutagenic properties, and human epidemiological data. *See* Ex. F ¶ 47 and Ex. H ¶¶s 11 and 13. Before it was finalized, the 2010 IRIS Assessment was first subject to a rigorous review process within the EPA, by other federal agencies and White House offices, and the public. *See* Ex. F ¶¶s 46–47. The conclusions of the 2010 IRIS Assessment were then vetted and confirmed by an independent external peer review panel. *See* Ex. F ¶ 47. After Denka raised objections, starting in 2016, to the then-published 2010 IRIS Assessment, the EPA again convened an independent external peer-review panel of experts to assess Denka's concerns.[6] *See* Ex. F ¶ 47 n.50 and ¶ 56. After thoroughly reviewing Denka's concerns, members of this second peer review panel found flaws in Denka's submission and its potential application in chloroprene risk assessment. The EPA consequently concluded that Denka's submission did not provide a valid basis to change the 2010 IRIS Assessment's findings about chloroprene's cancer-causing potential. *See* Ex. F ¶ 56.

No post-2010 science undermines the 2010 IRIS Assessment's conclusions about chloroprene's carcinogenic effects. *See* Ex. F ¶¶s 55–57; *see also* Ex. H ¶¶s 23-30 (reviewing Denka's 2021 analysis of Louisiana Tumor Registry data) and 46-51.

D. People in St. John the Baptist Parish should not be exposed to a greater than 1-in-10,000 risk of contracting chloroprene related cancers

A 1-in-10,000 risk is a generally accepted upper threshold for acceptable lifetime excess cancer risk associated with exposure to a single pollutant. *See* Ex. D ¶¶s 59 and 67.c., and Ex. F ¶ 59. EPA air and non-air programs use this threshold. *See* Ex. D Attach. 8. So do other federal agencies that regulate human health risks from carcinogens. *See id*.

For example, the EPA follows a policy that sets a presumptive 1-in-10,000 upper threshold for acceptable excess lifetime cancer risk when the agency reviews national emission standards for hazardous air pollutants ("NESHAPs") governing source categories under Clean

[6] Denka filed a series of administrative petitions under the Information Quality Act (Section 515 of Pub. Law 106-554 (2000), codified at 44 U.S.C. §§ 3504(d)(1) and 3516) challenging the 2010 IRIS assessment. Denka's ultimate goal was to increase the 0.2 μg/m^3 IRIS value by roughly two orders of magnitude. Denka's chloroprene emissions consistently meet its preferred value. *See* Ex. E. After thorough consideration, the EPA denied each of Denka's petitions, most recently in October 2022. Denka recently filed an action under the Administrative Procedure Act, 5 U.S.C. §§ 551 *et seq.*, to challenge the EPA's decisions. *See Denka Performance Elastomer LLC v. U.S. EPA, et al.*, No. 2:23-cv-147 (E.D. La. 2023).

Air Act Section 112(f), 42 U.S.C. § 7412(f).[7] *See* 54 Fed. Reg. 38,044, 38,045 (Sept. 14, 1989) (EPA's "1989 Residual Risk Policy").[8] Congress subsequently endorsed this policy in the Clean Air Act's 1990 amendments. *See* 42 U.S.C. § 7412(f)(2)(B). A handful of Clean Air Act NESHAPs, out of dozens, have tolerated greater than 1-in-10,000 cancer risks presented by individual source categories. *See* Ex. F ¶ 60. But these rare exceptions were for narrow, case-specific reasons that are not relevant to Denka's Facility. *See* Ex. F ¶¶s 61-66. Moreover, in no instance did the allowable estimated risks exceed 2.7-in-10,000, and only about 120 people *in total* were expected to be exposed to such risks. *See id.* ¶ 65.

E. Air Monitoring Shows Average Chloroprene Levels Consistently Much Greater Than 0.2 μg/m^3

A substantial, multi-year set of air monitoring data shows that the communities surrounding Denka's Facility are being exposed to long-term average airborne chloroprene levels that are between two and over fourteen times greater than 0.2 μg/m^3. *See* Ex. D ¶¶s 25–53, Ex. E, Ex. J, Decl. of Jiayang Chien, and Ex. K, Decl. of Richard A. Wayland. Chloroprene concentrations greater than 0.2 μg/m^3 extend about two-and-a-half miles from Denka's Facility. *See* Ex. D ¶¶s 39–43, Attach. 3 and 4 and Ex. E; *see also* Ex. J and Ex. K.

In mid-to-late 2016, the EPA and Denka both began monitoring chloroprene concentrations in the air around Denka's Facility. *See* Ex. D ¶¶s 39 and 43. Two monitoring

[7] NESHAPs are regulations that limit the amount of hazardous air pollutants from designated industrial source categories. *See* 42 U.S.C. § 7412(d)(1). Source categories are groups of stationary sources of air pollution that generally correspond to a common type of manufacturing processes or equipment within a given industry. For example, there are source category NESHAPs that cover petroleum refineries, the pulp and paper industry, and synthetic organic chemicals manufacturing plants.

[8] The EPA established the 1989 Residual Risk Policy in response to a court order directing the agency to determine the limits of what constitute "safe" or "acceptable" risk levels based on a judgment of "what risks are acceptable in the world in which we live." *NRDC, Inc. v. U.S. E.P.A.*, 824 F.2d 1146, 1165 (D.C. Cir. 1987).

networks (one operated by Denka, the other by the EPA) were installed. *See id.* ¶¶s 26–31. This monitoring was intended to better understand the amount of chloroprene in the air near Denka's Facility and to better characterize the associated health risks to the surrounding communities. *See id.* ¶ 25.

Until the EPA stopped using its original monitors in mid-2020, both the EPA's and Denka's monitors gathered 24-hour air samples to measure for chloroprene every few days.[9] *See* Ex. D. ¶¶s 27 and 30. The EPA's six monitors were located in a rough ring *outside* the Facility's property line. *See id.* ¶ 28, Attach 3. Denka's six monitors, which continue to collect samples, are located at points *on* the Facility's property line that are close to, but not exactly the same as, the EPA's monitors. *See id.* ¶ 31, Attach 3. These air monitors have generated a robust and reliable set of data to assess human exposure and the associated public health risks from Denka's chloroprene emissions.[10] *See id.* ¶¶s 33-34 (explaining that the available ambient air monitoring data is one of the best sources of exposure data for estimating inhalation cancer risks from Denka's chloroprene emissions).

The results from both Denka's and the EPA's air monitoring networks closely align and consistently show average airborne chloroprene concentrations in the communities surrounding

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[9] The EPA discontinued its 24-hour monitoring in favor of a different type of monitor that focuses on detecting short-term, higher-level emission "spikes." *See* Ex. D ¶ 51.

[10] In 2022, Denka also deployed a network of "passive" diffusion tube monitors that measure chloroprene emissions over two-week intervals. *See* Ex. D ¶¶s 36 and 46. Twenty-one of these passive monitors were ultimately installed along the Facility's fenceline. *See id.* ¶ 36. Consistent with the results of the EPA's and Denka's 24-hour air sampling, all 21 of these monitors have measured chloroprene concentrations averaging 0.2 µg/m^3 or greater since they began operating. *See id.* ¶ 49, Attach. 7.

Denka's Facility that are very high – multiples greater than 0.2 μg/m^3.[11] *See* Ex. D ¶ 38, 45 and Attach. 5 and 6; Ex. E. These high levels persist even though Denka substantially cut the Facility's chloroprene emissions after purchasing it.[12] *See* Ex. D Attach 2. The hundreds of people living within one mile of the Pontchartrain Works Site (primarily near the "Chad Baker" and "Western" monitors) are being exposed to the highest average levels of chloroprene – more than fourteen times greater than 0.2 μg/m^3. *See id.* ¶ 59; *see also* Ex. C ¶¶s 21 and 30(b). Indeed, one of the highest chloroprene concentrations (*almost 600 times greater than 0.2 ug/m^3*) was recently measured on Monday, October 10, 2022 – a school day – at Denka's Western Site, just a few hundred feet from the Fifth Ward Elementary School. *See* Ex. D ¶ 62 (measurement of 118 ug/m^3). Even the lowest measured average value for Denka's five closest monitors (out of the six total) is about four times greater than 0.2 μg/m^3. *See* Ex. D Attach. 4 and Ex. E.

Although this case focuses on current average airborne chloroprene concentrations, the cumulative impacts from the Facility's decades of historical emissions cannot be ignored. Chloroprene emissions and the consequent cancer risks to the public were even higher before Denka implemented the projects required by the 2017 State AOC. *See* Ex. D ¶¶s 14, 37, 52, 61, Attach. 2.

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[11] Because the newer system of 21 passive fenceline monitors has been operating for less than one year and uses a different monitoring methodology, we primarily rely on the data from the 24-hour monitors to determine longer-term average chloroprene concentrations. *See* Ex. D ¶ 36.

[12] In 2017, Denka and the Louisiana Department of Environmental Quality ("Louisiana DEQ") entered into an administrative order on consent (the "2017 State AOC"), which committed Denka to a series of emission control projects to cut its chloroprene emissions by 85%. *See* Ex. M at 1, § V.

F. The Proposed Preliminary Injunctive Relief is Feasible and Tailored to Reduce Denka's Chloroprene Emissions

The United States requests that the Court order Denka to perform two basic categories of actions, all of which are technically feasible, reasonable, and tailored to addressing the imminent and substantial endangerment caused by the Facility's emissions. Unless Denka completes these actions, it must immediately cease chloroprene and Neoprene production at the Facility. *See* Ex. A at 1. First, Denka must take a series of specific, achievable near-term actions to immediately reduce the Facility's chloroprene emissions. *See* Ex. A ¶¶s 2-6(a)-(c); *see also* Ex. G ¶¶s 37-73, 78, 86-88, and 91. Second, Denka must begin planning the long-term air pollution control equipment needed to permanently reduce the risks from its chloroprene emissions. *See* Ex. A ¶¶s 6(d)-8; *see also* Ex. G ¶¶s 76-79, 90, and 92. This permanent relief will ultimately reduce the chloroprene-related cancer risks from Denka's Facility to acceptable levels.

1. Immediate actions

The proposed order requires Denka to physically enclose several known chloroprene sources so that their now-diffuse, or simply uncontrolled, emissions can be captured and then routed to effective air pollution control equipment.[13] *See* Ex. A ¶ 2. This requirement targets the Facility's several "Poly Kettle Strainers." *See id*; *see also* Ex. G ¶¶s 39-44 (explaining what the Poly Kettle Strainers are) and Ex. I ¶ 26. Until more permanent structures can be built, reasonable interim enclosures can and should be constructed relatively quickly. *See* Ex. G ¶¶s 45

[13] Denka has existing air pollution control equipment that is effective at reducing chloroprene emissions. For example, its existing "Regenerative Thermal Oxidizer" – a type of thermal incinerator for air pollutants – can destroy more than 98% of the chloroprene in waste gases routed to it. *See* Ex. G ¶ 27. There are also third-party vendors that can provide similarly effective, trailer-mounted air pollution control equipment that can be quickly brought onsite and installed to reduce Denka's chloroprene emissions. *See id*. ¶¶s 67, 78, and 86.

and 48-49. And effective permanent enclosures can be built within a few months. *See id.* ¶¶s 46-47 and 50-51.

The proposed order also requires Denka to capture and control emissions from certain emissions-generating waste handling practices, such as cleaning out coagulated waste polymer from the Poly Kettle Strainers. *See* Ex. A ¶ 3 and Appd'x; *see also* Ex. G ¶¶s 38-40 and 43; Ex. I ¶ 25 (explaining how Denka uses the Outside Brine Pit to treat "Waste Coag"). These requirements can be accomplished using relatively simple covered wheeled containers or drums. *See* Ex. G ¶¶s 52-54. Denka has already evaluated the effectiveness of some of these practices. *See id.* ¶ 53. And emissions from some of these sources and activities can already be controlled by taking advantage of unused capacity in existing onsite air pollution equipment, like the Facility's Regenerative Thermal Oxidizer. *See id.* ¶¶s 53 and 79.

Denka must also improve how it controls chloroprene emissions from certain common maintenance activities at the Facility, such as cleaning out other types of tanks and vessels that handle chloroprene-containing materials. *See* Ex. A ¶ 4. These cleaning activities often require such vessels to be opened to the air, which creates the potential for chloroprene emissions. *See* Ex. G ¶¶s 38 and 57-59; Ex. I ¶ 23. The proposed order requires Denka to control both the air emissions and wastewater generated from such cleaning activities.[14] *See* Ex. A ¶ 4; *see also* Ex. G ¶ 60. Improved sequencing in the cleaning procedure, as well as including new cleaning steps, are a first step Denka can take to reduce chloroprene emissions relatively simply and inexpensively. *See* Ex. G ¶¶s 61-63 and 66-67.

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[14] Because chloroprene readily evaporates, it will quickly volatilize from unenclosed wastewater and become fugitive air emissions. *See* Ex. G ¶¶s 16, 29, 60, and 90-91.

Denka is also required under the proposed order to improve certain lax, easy-to-fix, housekeeping practices that EPA inspections have identified as sources of excess chloroprene emissions. *See* Ex. A ¶ 6(a)-(b); *see also* Ex. G ¶ 58 and Ex. I ¶¶s 48-54. For example, ensuring that hatches and openings to chloroprene-containing vessels are not unnecessarily left open, as well as ensuring that hatch seals are maintained so that they close properly and do not leak chloroprene into the air. *See* Ex. A ¶ 6(a)-(b); *see also* Ex. G ¶ 58 and Ex. I ¶¶s 54-55.

Lastly, Denka must improve its leak detection and repair ("LDAR") procedures, first at one specific Facility location (the "Poly Building"), then Facility-wide.[15] *See* Ex. A ¶ 6(b)-(c); *see also* Ex. G ¶¶s 68-73 and Ex. I ¶¶s 56-57. These improvements include increasing how often Denka inspects equipment components that have the potential to "leak" chloroprene. *See* Ex. A ¶ 6(b)-(c); *see also* Ex. G ¶¶s 72-73 and Ex. I ¶ 57. Denka must also lower its leak detection and repair action threshold, so that more leaks are detected and repaired sooner. *See* Ex. A ¶ 6(b)-(c); *see also* Ex. G ¶ 72 and Ex. I ¶¶s 53 and 58.

2. Planning for long-term, permanent emission reductions

The requested preliminary injunction orders Denka to develop plans, in accordance with specifications in the proposed order, that propose the actions Denka will take to permanently reduce the cancer risks from its chloroprene emissions upon entry of a final, permanent injunction by this Court. *See* Ex. A ¶¶s 6(d)-8. These plans, which must be filed with the Court by specified deadlines, must propose how Denka will control emissions from the major

[15] LDAR is a program designed to identify and reduce fugitive emissions by monitoring certain types of equipment components that have the potential to leak volatile organic compounds and/or hazardous air pollutants (*e.g.*, valves, pumps, piping connectors, hatch seals and gasketing). *See* Ex. G ¶¶s 69-70 and Ex. I ¶ 4 n.1. A leak is defined by reference to a specific detected concentration of volatile organic compounds and/or hazardous air pollutants (*e.g.*, 100 parts per million of chloroprene). *See* Ex. G ¶ 69 and Ex. I ¶ 4 n.1. Monitoring results that indicate leaks trigger repair requirements to reduce emissions that can eventually reach the atmosphere. *See id.*

remaining known chloroprene sources at the Facility – the Facility's Poly Kettle Building, Neoprene "wash belts," and wastewater system, including an uncontrolled and unenclosed waste pit (the "Outside Brine Pit"). *See* Ex. A ¶¶s 6(d)-8; Ex. G ¶¶s 78-79 and 91-92 and Ex. I ¶ 25 (explaining the types of coagulated polymer wastes treated in the Outside Brine Pit). There are commonly available air pollution control technologies and operational practices that Denka can implement to meet the required specifications. *See, e.g.*, Ex. G ¶¶s 30-31 and 35-36. The Preliminary Injunction Order also includes the deadlines by which the proposed work must be completed. *See* Ex. A ¶¶s 6(d)-8. But Denka need not implement the plans' requirements until it is ordered by the Court to do so. *See id.*

3. Monitoring compliance

Denka must file monthly reports with the Court that describe Denka's compliance with the preliminary injunction. *See* Ex. A ¶ 9 (describing content of monthly status reports).

4. Facility access and consent of landlord

Denka must provide the United States with full access to the Facility to monitor compliance with this Order, including by conducting inspections, monitoring, and sampling. *See* Ex. A ¶ 1.

Denka must also take all necessary steps to secure the consent of its landlord, DuPont Specialty Products, so that Denka is permitted under the terms of its 99-year Ground Lease to undertake all actions needed to comply with the Court's order. *See* Ex. A ¶ 1. Some of the work required by the proposed preliminary injunction might trigger DuPont Specialty Products' rights under the Ground Lease as Denka's landlord.

Legal Background

A. 42 U.S.C. § 7603 – Clean Air Act Section 303

42 U.S.C. § 7603 is an endangerment provision that, like its counterparts in several other environmental statutes, broadly grants "appropriate government officials the right to seek judicial relief or take other appropriate actions to avert imminent and substantial threats to the environment or public health." *United States v. Reilly Tar & Chem. Corp.*, 546 F. Supp. 1100, 1107 (D. Minn. 1982). The statute's key portion authorizes a civil action to abate such threats from air pollution. *See* 42 U.S.C. § 7603 (authorizing "district court to immediately restrain any person causing or contributing to the alleged pollution to stop the emission of air pollutants…or to take such other action as may be necessary").

The text of 42 U.S.C. § 7603 empowers this Court to act decisively when presented with compelling evidence that a pollution source, like Denka's Facility, is presenting an imminent and substantial endangerment to public health or welfare. *See United States v. New-Indy Catawba, LLC*, No. 0:21-CV-02053-SAL, 2022 WL 18357257, at *10 (D.S.C. Sept. 15, 2022), *appeal docketed sub nom.*, *Enrique Lizano v. New-Indy Catawba, LLC*, No. 23-1052 (4th Cir., Jan. 17, 2023). And, unlike the Clean Air Act's other enforcement authorities (42 U.S.C. § 7413(a)-(d)), the United States need not prove that an underlying statutory or regulatory requirement was violated in order to invoke 42 U.S.C. § 7603. *See New-Indy Catawba*, 2022 WL 18357257, at *10; *see also Guidance on Section 303 of the Clean Air Act* at 1 (April 1999) ("EPA 303 Guidance") (noting that 42 U.S.C. § 7603 "is a 'gap-filling' authority, providing a basis for injunctive relief… regardless of a pollution source's compliance or noncompliance with the [Clean Air] Act").

The statute's plain language, as well as the related legislative history, instructs the Court to "giv[e] *paramount importance* to the sole objective of the public health" and "to overlook technological and economic feasibility" in the name of achieving this objective. *Trinity Am. Corp. v. U.S. E.P.A.*, 150 F.3d 389, 394-95 (4th Cir. 1998) (*citing United States v. Hooker Chem. & Plastics Corp.*, 749 F.2d 968, 988 (2d Cir. 1984)) (emphasis added). Indeed, 42 U.S.C. § 7603 empowers this Court to immediately enjoin endangerments to public health and welfare caused by air pollution "[n]othwithstanding any other provision of [the Clean Air Act]." *See Trinity*, 150 F.3d at 394-95 (citing Safe Drinking Water Act legislative history and explaining that "EPA's powers under this provision are 'intended to override *any* limitations upon the Administrator's authority found elsewhere' in the Act") (emphasis in original).[16]

42 U.S.C. § 7603 therefore gives the Court jurisdiction to craft "complete relief" in light of its statutory purposes and the Clean Air Act's broader purposes. *See Mitchell v. Robert De Mario Jewelry*, 361 U.S. 288, 291-92 (1960); *see also* 42 U.S.C. § 7401(b)(1). There is no limitation in 42 U.S.C. § 7603 suggesting otherwise. *Cf. Mitchell*, 361 U.S. at 291-92 (jurisdiction is "not to be denied or limited in the absence of a clear and valid legislative command"); *see also United States v. ATP Oil & Gas Corp.*, 955 F. Supp. 2d 616, 636 (E.D. La. 2013) (courts' equitable powers are "at their apex when the public interest is involved").

Although there are no cases discussing the statutory provision in detail, the Clean Air Act's legislative history is clear that 42 U.S.C. § 7603 is intended "to conform the [EPA's] emergency authority under the [Clean Air Act] to emergency authorities under other environmental laws." S. Rep. No. 101-228 (1989), 1990 U.S.C.C.A.N. 3385, 3753 (citing the

[16] It does not matter that the EPA will soon propose revisions under 42 U.S.C. § 7412(d)(6) to existing regulations at 40 C.F.R. Part 63, Subparts G and U that govern the Facility's chloroprene emissions. It also does not matter that the Facility's chloroprene emissions are already regulated under one of Denka's "Title V" operating permits (required under 42 U.S.C. §§ 7661-7661f) or the terms of Louisiana's state implementation plan (required by 42 U.S.C. § 7410). *See* 40 C.F.R. § 70.6(f)(3)(i). 42 U.S.C. § 7603 provides a cause of action notwithstanding any of these other Clean Air Act requirements. *See* EPA 303 Guidance at 1.

imminent and substantial endangerment authorities under the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. § 6973(a), the Clean Water Act, 33 U.S.C. § 1364(a), and the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9606(a)). The legislative history behind these analogous environmental statutes, as well as the caselaw interpreting them, would thus be the proper tools to understand 42 U.S.C. § 7603 if its plain text was not clear.[17]

B. Standard for Preliminary Injunctions in Statutory Enforcement Cases

Private plaintiffs seeking a preliminary injunction must prove: (1) they are likely to succeed on the merits; (2) they are likely to suffer irreparable harm in the absence of a preliminary injunction; (3) the balance of equities tips in their favor; and (4) a preliminary injunction is in the public interest. *Winter v. Natural Resources Def. Council*, 555 U.S. 7, 20 (2008). These factors are viewed and weighed differently here, however, because the United States is bringing a statutory action for injunctive relief on behalf of the public. Fifth Circuit precedent explains that, in such cases, the Court may issue an injunction "without making findings of irreparable harm, inadequacy of legal remedy, or the balance of convenience" if the United States proves it is likely to succeed on the merits. *See, e.g.*, *United States v. Marine Shale Processors*, 81 F.3d 1329, 1358-59 (5th Cir. 1996); *White v. Carlucci*, 862 F.2d 1209, 1211 (5th Cir. 1989); *United States v. Hayes Int'l Corp.*, 415 F.2d 1038, 1045 (5th Cir. 1969).

"The Supreme Court emphasize[s] that when a court is called upon to enforce a federal statutory injunction, its reliance upon the traditional practices of equity must be 'conditioned by

[17] Courts look to analogous language in similar endangerment statutes for interpretive guidance. *See Reilly Tar & Chem. Corp.*, 546 F. Supp. at 1107; *see also United States v. Price*, 577 F. Supp. 1103, 1110-11 (D.N.J. 1983) (comparing CERCLA § 106 and RCRA § 7003 "imminent hazards" provisions is "inevitable"); *see also United States v. E.I. du Pont de Nemours & Co.*, 341 F. Supp. 2d 215, 246-48 (W.D.N.Y. 2004) (examining RCRA caselaw to interpret "imminent and substantial endangerment" in a CERCLA case).

the necessities of the public interest which Congress has sought to protect.'" *United States v. City of Painesville, Ohio*, 644 F.2d 1186, 1193 (6th Cir. 1981) (*quoting Hecht Co. v. Bowles*, 321 U.S. 321, 330 (1944)); *see also Weinberger v. Romero-Barcelo*, 456 U.S. 305, 319 (1982). The Court's traditionally broad discretion in deciding whether to grant injunctive relief is consequently shaped by the "'judgment of Congress, deliberately expressed in [the] legislation.'" *See United States v. Oakland Cannabis Buyers' Co-op.*, 532 U.S. 483, 497 (2001) (*citing Virginian Ry. Co. v. Ry. Emp.*, 300 U.S. 515, 551 (1937)).

Here, the Court's discretionary injunctive powers are "tempered by its obligation to carry out the congressional mandate contained in the Clean Air Act." *City of Painesville, Ohio*, 644 F.2d at 1193. Congress has "deliberately expressed" in 42 U.S.C. § 7603 that enjoining endangerments to public health and welfare should be given paramount importance "[n]othwithstanding" any other part of the Clean Air Act. *See* 42 U.S.C. § 7603. Consequently, if the United States proves that it is likely to succeed in its claim that Denka's chloroprene emissions are causing a public health endangerment, the Court cannot dispute that "enforcement is preferable to no enforcement at all." *Oakland Cannabis Buyers' Co-op.*, 532 U.S. at 497 ("Courts of equity cannot, in their discretion, reject the balance that Congress struck in a statute" or "override Congress' policy choice, articulated in a statute, as to what behavior should be prohibited"). The Court must use 42 U.S.C. § 7603's authority to abate the endangerment. *See id*. at 497-98; *see also City of Painesville*, 644 F.2d at 1194 (Congress placed "high priority" on controlling air pollution when it enacted the Clean Air Act). And here, the requested injunctive relief is the best means to vindicate 42 U.S.C. § 7603's objectives. *See Weinberger*, 456 U.S. at 314 (analyzing *Tennessee Valley Auth. v. Hill*, 437 U.S. 153 (1978)).

Furthermore, the Court should analyze the individual *Winter* factors in a light more favorable to the United States because the requested injunction seeks to protect a statutory public interest. *See, e.g.*, *Maine People's All. and Nat. Res. Def. Council v. Mallinckrodt, Inc.*, 471 F.3d 277, 296 (1st Cir. 2006) (explaining that the factors for an injunction are "inevitably colored by the nature of the case and the purposes of the underlying environmental statute"); s*ee also Marine Shale Processors*, 81 F.3d at 1358-59 (emphasizing the "the extraordinary weight courts of equity place upon the public interests in a suit involving more than a mere private dispute").

ARGUMENT

Without the requested injunction, Denka's chloroprene emissions will continue to cause rapidly accumulating and unacceptably high lifetime excess cancer risks to thousands of infants, children, and adults living in St. John the Baptist Parish. And unnecessarily so. There are reasonable actions that Denka can immediately take to reduce the public health risks its emissions are causing. *See generally* Ex. G ¶¶s 37-73, 78, 86-88, and 91.

The Supreme Court has found that the Clean Water Act's virtually identical endangerment provision is a "rule of immediate cessation." *Weinberger*, 456 U.S. at 317 (explaining that 33 U.S.C. § 1364(a) "*directs*…the EPA to seek an injunction to restrain immediately discharges of pollutants [it] finds to be presenting an imminent and substantial endangerment") (emphasis added). The Court should similarly construe 42 U.S.C. § 7603 and issue an injunction after the United States shows a likelihood of success on the merits. *See City of Painesville*, 644 F.2d at 1194 ("district court was required to order injunctive relief upon its finding of liability"); *see also E.I. du Pont de Nemours & Co.*, 341 F. Supp. 2d at 247 (*citing United States v. Conservation Chem. Co.*, 619 F. Supp. 162, 192 (W.D. Mo. 1985), *overruled on other grounds*, *United States v. Ne. Pharm. & Chem. Co.*, 810 F.2d 726 (8th Cir. 1986)) ("The expansive scope of the terms 'public welfare' and 'environment' mandates the conclusion that

Congress intended injunctive relief to issue whenever any aspect of the nation's interest in a clean environment may be endangered imminently and substantially"). Congress' "order of priorities," as expressed in 42 U.S.C. § 7603 would be "deprived of effect" if the Court chose to deny the requested injunctive relief. *Id.* (*citing Hill*, 437 U.S. at 173) (finding that the district court in *Hill* "lacked discretion" to refuse to order an injunction).[18]

It is true that a court is ordinarily "not mechanically obligated to grant an injunction for every violation of law." *Weinberger*, 456 U.S. at 313; *Oakland Cannabis Buyers' Co-op.*, 532 U.S. at 496. But without the requested injunction, Denka's chloroprene emissions will defy the intent behind 42 U.S.C. § 7603 and continue at levels that present unacceptably high cancer risks to thousands of Parish residents, particularly infants and young children. *See, e.g.*, Ex. D ¶¶s 69–70 and Ex. I ¶ 54. The Court should therefore act to "stop the emission[s]…causing or contributing to such pollution." 42 U.S.C. § 7603.

I. The United States is Likely to Prove that Denka's Carcinogenic Chloroprene Emissions Constitute an Imminent and Substantial Endangerment

To show a likelihood of success on the merits, the United States must clearly satisfy the burden of persuasion. *See Monumental Task Comm., Inc. v. Foxx*, 157 F. Supp. 3d 573, 582 (E.D. La. 2016), *aff'd sub nom. Monumental Task Comm., Inc. v. Chao*, 678 F. App'x 250 (5th Cir. 2017) (same). But that does not require the United States to prove that it is entitled to

[18] 42 U.S.C. § 7603 authorizes the requested mandatory preliminary injunction and is not limited to prohibitory final injunctions. *See* 42 U.S.C. § 7603 (Court may immediately "stop" the emissions or require Denka "to take such other action as may be necessary"). Here, the status quo is actively endangering public health. It is therefore "necessary to alter the situation." *Canal Auth. of State of Fla. v. Callaway*, 489 F.2d 567, 576 (5th Cir. 1974); *see also United States v. Price*, 688 F.2d 204, 212 (3d Cir. 1982) (mandatory preliminary injunction proper when "the status quo is a condition of action which, if allowed to continue or proceed unchecked and unrestrained, will inflict serious irreparable injury"); *Francisco Sanchez v. Esso Std. Oil Co.*, 572 F.3d 1, 21 (1st Cir. 2009).

summary judgment. *See Monumental Task Comm., Inc.*, 157 F. Supp. 3d at 585; *Daniels Health Scis., L.L.C. v. Vascular Health Scis., L.L.C.*, 710 F.3d 579, 582 (5th Cir. 2013).

A. Denka's Facility is a "pollution source"

Denka's Facility emits more than one hundred tons of air pollution each year. *See* Ex. G ¶ 14. There is no serious dispute that it is a "source" or "combination of sources" of air pollution. *See* 42 U.S.C. § 7603. A plain English reading suggests that the Facility fits these terms, and a closer inspection of the statutory text confirms this conclusion.[19] In addition, each of the Facility's three process units has its own Clean Air Act Title V operating permit because each unit is regulated as a "major" stationary source of air pollution. *See* Ex. G ¶ 14 and Ex. I ¶ 21.[20]

There is also no serious dispute that the hazardous chloroprene Denka's Facility emits into the air constitutes "pollution." *See* 42 U.S.C. § 7603. Chloroprene is a chemical substance and statutorily designated hazardous air pollutant. *See* 42 U.S.C. § 7412(b)(1) (listing chemicals designated as hazardous air pollutants). It is therefore an "air pollution agent" and an "air pollutant." *See* 42 U.S.C. § 7602(g) (defining "air pollutant" as "any air pollution agent or combination of such agents, including any…chemical substance…which is emitted into or otherwise enters ambient air").

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[19] The unqualified terms "source" and "pollution source" encompass the more specific "stationary sources" and "moving sources." *See* 42 U.S.C. § 7603 (confirming that "sources" includes "moving" sources). Denka's Facility clearly is a "stationary source" – one type of source or pollution source. *See* 42 U.S.C. § 7411 (defining "stationary source" to include "any building, structure, facility, or installation which emits or may emit any air pollutant").

[20] The Clean Air Act requires Title V operating permits – named for the Clean Air Act subchapter that mandates them – for major sources of air pollution. *See* 42 U.S.C. § 7661a(a); *see also* 42 U.S.C. § 7661(2) (defining "major source" for purposes of Clean Air Act Title V permitting requirements). The purpose of a Title V operating permit is to ensure that all "applicable requirements" governing a facility's Clean Air Act compliance are consolidated and expressed in one document. *See* 42 U.S.C. § 7661c(a).

B. Denka is "causing or contributing to" the chloroprene pollution

There is no legitimate dispute that Denka is "causing or contributing to" the chloroprene emissions that thousands of people in St. John the Baptist Parish are breathing. *See* 42 U.S.C. § 7603. Multiple sets of air monitors have been detecting chloroprene in populated areas of the Parish, including near homes and schools. *See* Ex. D ¶¶s 25–53, Ex. E, Ex. J, and Ex. K. The sole source of that chloroprene is Denka's Facility. *See* Ex. D ¶ 13, Attach 2.

C. Denka is a "person"

Denka is a "person" within the meaning of 42 U.S.C. § 7603. Limited liability companies ("LLCs") meet the Clean Air Act's definition of person, even though that type of business entity is not explicitly referenced. *See* 42 U.S.C. § 7602(e). The statutory definition uses the term "includes" to preface a non-exhaustive array of private, public, and not-for-profit entities that fall within the broad scope of "person." *See id.*; *see also Cox v. City of Dallas, Tex.*, 256 F.3d 281, 293 (5th Cir. 2001) (explaining that "includes" indicates a non-exhaustive list).

D. The increased cancer risk from Denka's chloroprene emissions is presenting an "imminent and substantial endangerment"

Distilled to its judicially interpreted essence, 42 U.S.C. § 7603 requires the United States to prove that Denka's chloroprene emissions are presenting a "threatened harm" to public health or welfare that is "serious" or "gives reasonable cause for concern." *See generally Cox*, 256 F.3d at 299-300; *Burlington N. & Santa Fe Ry. Co. v. Grant*, 505 F.3d 1013, 1021 (10th Cir. 2007). That straightforward burden of proof is met here.

The Fifth Circuit, consistent with other courts, makes clear that the statutory terminology "imminent and substantial endangerment" should be broadly interpreted. *See Cox*, 256 F.3d at 299-300; *see also* S. Rep. No. 101-228 (1989), 1990 U.S.C.C.A.N. 3385, 3753 (confirming that 42 U.S.C. § 7603's authority is intended to match the other environmental endangerment statutes). These broad interpretations are warranted, courts recognize, because Congress chose to give "paramount importance" to the objective of protecting public health when it enacted the current set of environmental endangerment statutes. *See Reilly Tar & Chem. Corp.*, 546 F. Supp. at 1110; *see also Trinity*, 150 F.3d at 399 (Safe Drinking Water Act case); *United States v. Apex Oil Co.*, No. 05-CV-242-DRH, 2008 WL 2945402, at *79 (S.D. Ill. July 28, 2008), *aff'd*, 579 F.3d 734 (7th Cir. 2009) (protecting human health and the environment is the "primary intent" of RCRA's endangerment statute).

1. Unacceptably high cancer risks are an actionable endangerment.

Thousands of infants, children, and adults living in St. John the Baptist Parish face the exact types of endangerments that motivated Congress to enact the environmental endangerment statutes. Being overexposed to carcinogenic agents, like Denka's chloroprene emissions, is one such scenario. *See Reilly Tar & Chem. Corp.*, 546 F. Supp. at 1110 (citing other relevant examples of *substantial* endangerments in the Safe Drinking Water Act's legislative history).

2. The endangerment from Denka's chloroprene emissions is imminent; the threat they pose is present now.

Denka's chloroprene is in St. John the Baptist Parish's air. People need to breathe that air. And at the long-term average chloroprene concentrations that many people living in the Parish are currently being exposed to, they will exceed (if they have not already exceeded) a 1-in-10,000 lifetime excess cancer risk far sooner than over an assumed 70-year lifetime. *See* Ex. D ¶¶s 53–63, Ex. E, Ex. J, and Ex. K. Every day that passes is another day that the communities near Denka's Facility remain exposed to its chloroprene emissions, with lingering biological effects. *See* Ex. F ¶ 43. Urinalysis testing confirms that chloroprene has entered the bodies of some Parish residents. *See id.* ¶ 44.

The speed at which chloroprene-related cancer risks accrue in infants and young children is particularly alarming. Infants who are born today in LaPlace and Reserve, Louisiana and consistently breathe the current average levels of chloroprene detected by the "Western Monitor" (by the neighborhood just west of Denka's Facility) will suffer double their lifetime acceptable excess cancer risk from chloroprene exposure by their second birthday – 68 years sooner than they should amass half as much. *See* Ex. D ¶¶s 64–66, Attach. 10 & 11 and Ex. E. A two-year old who moves into that neighborhood and attends the Fifth Ward Elementary School will amass their lifetime acceptable excess cancer risk before they can legally drive a car. *See* Ex. D ¶ 65. And a teenager living there who begins breathing Denka's chloroprene emissions at age 16 will surpass their lifetime acceptable excess cancer risk decades before the end of their assumed 70-year lifetime. *See id.*; *see also* Ex. C ¶¶s 32, 37 and 44-45.

The pace at which these risks accumulate is measured in years, which may not sound alarming or strikingly imminent. But endangerments are "imminent" so long as the *threat of harm* is present now, even though actual resulting harms may not immediately materialize. *See Cox*, 256 F.3d at 299; *Conservation Chem. Co.*, 619 F. Supp. at 193–94 ("an endangerment is 'imminent' if factors giving rise to it are present, even though the harm may not be realized for years").

Denka's current chloroprene emissions are therefore still causing an *imminent* endangerment even if they create only a latent threat of developing cancer. That conclusion makes sense given the insidious reality of cancer's furtive, slow-moving development – cancers generally have years-long "incubation" periods. *See* Ex. F ¶ 41. Even a twenty-year latency period does not disqualify Denka's emissions as a near-term, imminent endangerment. *See Mallinckrodt, Inc.*, 471 F.3d at 279 n.1 (even if there is "a reasonable prospect that a carcinogen released into the environment today may cause cancer *twenty years hence*, the threat is near-term even though the perceived harm will only occur in the distant future") (emphasis added). Congress clearly intended the endangerment statutes to protect against cancer risks despite the inherent uncertainty of whether exposure will ever actually materialize into diagnosable cancer. *See Reilly Tar & Chem. Corp.*, 546 F. Supp. at 1110.

Furthermore, to prove imminence, the United States does not need to show an increased number of deaths or an increased cancer rate among Parish residents, *i.e.*, that actual harm has occurred or will necessarily ever occur.[21] *See Cox*, 256 F.3d at 299-300 ("imminence" requires that the harm pose a near-term threat, but there is no requirement for proof or certainty that actual harm will necessarily occur); *Apalachicola Riverkeeper v. Taylor Energy Co., LLC*, 954 F. Supp. 2d 448, 459 (E.D. La. 2013) (serious threat of harm suffices); *see also* Ex. H ¶¶s 23-30 (refuting Denka's assessment of cancer rates in the Parish and associated census tracts). That interpretation of imminence makes sense because Congress enacted statutes like 42 U.S.C. § 7603 to stop endangerments *before* they result in actual harm. *See, e.g.*, *Schmucker v. Johnson Controls, Inc.*, No. 3:14-CV-1593 JD, 2019 WL 718553, at *26 (N.D. Ind. Feb. 19, 2019) (emphasizing that the purpose of RCRA's statute "is preventative, and allows courts to order relief to keep those risks from coming to pass"); *see also* Ex. F ¶ 41. Even the *possibility* of being exposed to carcinogenic substances may be enough. *See Apalachicola Riverkeeper*, 954 F.

[21] Conversely, it should not matter that people have been exposed to the Facility's chloroprene emissions for years. *See Davis v. Sun Oil Co.*, 148 F.3d 606, 610 (6th Cir. 1998) ("An 'imminent hazard' may be declared at any point in a chain of events which may ultimately result in harm to the public"); *see also Burlington N. & Santa Fe Ry. Co.*, 505 F.3d at 1021 (*citing Price v. United States Navy*, 39 F.3d 1011, 1019 (9th Cir. 1994)); *see also Interfaith Cmty. Org. v. Honeywell Int'l, Inc.*, 263 F. Supp. 2d 796, 837 (D.N.J. 2003), *aff'd*, 399 F.3d 248 (3d Cir. 2005) ("[i]mminence refers 'to the nature of the threat rather than identification of the time when the endangerment initially arose'").

Supp. 2d at 459 (oil spill that was 11 miles offshore and to which no plaintiff had yet been directly exposed sufficiently alleged an imminent and substantial endangerment to overcome a motion to dismiss); *see also Interfaith Cmty. Org. v. Honeywell Int'l*, 399 F.3d 248 (3d Cir. 2005) (affirming injunction under RCRA to abate the endangerment posed simply by current exposure pathways to carcinogenic hexavalent chromium-containing contamination).

Here, multiple reliable data sets, including from Denka, consistently show long-term average chloroprene levels that will lead to unacceptably high lifetime excess cancer risks in a handful of years. *See* Ex. D ¶ 53, Ex. E, Ex. J, and Ex. K. These conditions are present now.

3. Cancer risks that are more than 14 times greater than the EPA's presumptive ceiling constitute a substantial endangerment.

The excess lifetime cancer risks that Denka's chloroprene emissions are causing are serious. *See* Ex. D ¶ 67 and Ex. F ¶ 66. And an endangerment is "substantial" if it is serious. *See, e.g.*, *Cox*, 256 F.3d at 300. Proving that a risk or threat is serious "'does not require quantification of the endangerment (*e.g.*, proof that a certain number of persons will be exposed…or that a [resource] will be contaminated to a specific degree).'" *Interfaith Cmty. Org.*, 399 F.3d at 259 (*quoting Conservation Chem. Co.*, 619 F. Supp. at 194); *see also Burlington N. & Santa Fe Ry. Co.*, 505 F.3d at 1021 (same). Rather, an endangerment is substantial if there is "reasonable cause for concern that someone or something may be exposed to risk of harm by release, or threatened release, of hazardous substances in the event remedial action is not taken." *Burlington N. & Santa Fe Ry. Co.*, 505 F.3d at 1021; *see also Apalachicola Riverkeeper*, 954 F. Supp. 2d at 459 (visible sheen from offshore oil spill sufficiently alleged substantial endangerment to overcome a motion to dismiss).

Although not required, the United States is presenting proof quantifying the excess lifetime cancer risks from Denka's chloroprene emissions. *See* Ex. D Attach. 9. Here, more than ten thousand Parish residents, including as many as one thousand that are younger than five years old, are being exposed to a serious risk of harm from Denka's carcinogenic chloroprene emissions. *See* Ex. C ¶¶s 29, 32, and 37. There is ample reason to have cause for concern. The air monitoring data are clear. *See* Ex. E. They show that people who live close to the Facility are currently exposed to average levels of chloroprene that are estimated to result in lifetime excess cancer risks that may reach more than fourteen times greater than the EPA's presumptive 1-in-10,000 threshold (*i.e.*, 14-in-10,000, or roughly 1-in-1,000). *See* Ex. D ¶ 62, Ex. E, and Ex. C ¶¶s 22 and 29-30. People living more than two miles away from the Facility are being exposed to a greater than 1-in-10,000 lifetime excess cancer risk. *See* Ex. D ¶¶s 65, 67 and Ex. E; *see also* Ex. C ¶¶s 22 and 29-30. The affected population includes the most vulnerable among them – infants, as well as young children who attend the local elementary school and live nearby. *See* Ex. C ¶¶s 32, 37, and 44-45 and Ex. E. And some of the affected people have lived in the Parish and breathed the air there for decades. *See* Ex. C ¶¶s 49 and 50. The risks to the surrounding communities from breathing Denka's carcinogenic chloroprene emissions are substantial.

It is not necessary to prove that actual harm – meaning, in this case, proof of a measurable increase in cancer incidence or resulting deaths – is afflicting Parish residents in order to establish that Denka's chloroprene emissions are causing a substantial endangerment under 42 U.S.C. § 7603. *See Cox*, 256 F.3d at 299. The caselaw is clear that no actual injury need ever occur. *See id.*; *see also Ethyl Corp. v. Env't Prot. Agency*, 541 F.2d 1, 13 (D.C. Cir. 1976). Serious threatened or potential harm suffices. *See Apalachicola Riverkeeper*, 954 F. Supp. 2d at 459; *Dague v. City of Burlington*, 935 F.2d 1343, 1356 (2d Cir. 1991) (affirming finding that landfill presented imminent and substantial endangerment under RCRA). The unacceptably high lifetime excess cancer risks caused by breathing Denka's chloroprene emissions are exactly this type of serious or potential harm.

It also does not matter that estimating cancer risk necessarily tolerates some scientific uncertainty. *See NRDC, Inc.*, 824 F.2d at 1165 (recognizing "the inherent limitations of risk assessment and the limited scientific knowledge of the effect of exposure to carcinogens at various levels"); *see also Apex Oil Co.*, 2008 WL 2945402, at *79 (explaining that the United States need not meet a standard of "exactitude" to prove up an endangerment). The point of 42 U.S.C. § 7603 and its statutory brethren is to authorize courts to intervene and prevent the worst public health outcomes from ever happening. Therefore, "'if an error is to be made in applying the endangerment standard, the error must be made in favor of protecting public health, welfare and the environment.'" *Interfaith Cmty. Org.*, 399 F.3d at 259 (*quoting Conservation Chem. Co.*, 619 F. Supp. at 194); *see also Burlington N. & Santa Fe Ry. Co.*, 505 F.3d at 1021 (same).

E. <u>The Facility "is presenting" an imminent and substantial endangerment</u>

Long-term average chloroprene concentrations – and the resulting unacceptably high cancer risks to Parish residents – will not meaningfully decrease without intervention. *See* Ex. D ¶¶s 62, 69–70, and Attach 2 (showing consistent TRI air emission data for the three most recent reported years); *see also* Ex. I ¶ 54. Denka's Facility "is presenting" an imminent and substantial endangerment to public health and welfare. *See* 42 U.S.C. § 7603.

Any difference in statutory language between 42 U.S.C. § 7603 – which includes the phrase "is presenting" – and other endangerment statutes like RCRA – that include the phrase "may present" – is immaterial here.[22] The legislative history of 42 U.S.C. § 7603 makes clear

[22] Some courts that have considered other endangerment statutes, such as RCRA's, note that "may" is an operative and more probabilistic term. *See, e.g.*, *Mallinckrodt, Inc.*, 471 F.3d at 287-89 (citing decisions that "emphasized the preeminence of the word 'may' in defining the degree of risk needed to support [an imminent and substantial endangerment claim]").

that Congress did not intend that section to result in less protection for public health or the environment than other environmental endangerment statutes. To the contrary, the statute's legislative history explains that 42 U.S.C. § 7603 was intended to match the other endangerment statutes, including the Clean Water Act's analogue, which also uses the phrase "is presenting." *See* S. Rep. No. 101-228 (1989), 1990 U.S.C.C.A.N. 3385, 3753; *see also* 33 U.S.C. § 1364(a). Even assuming 42 U.S.C. § 7603 requires a higher standard than the other endangerment statutes, the cancer risks caused by Denka's chloroprene emissions meet that standard.

II. Public Health in St. John the Baptist Parish is Likely to Suffer Irreparable Harm Without the Requested Preliminary Injunctive Relief

The Court can presume that irreparable harm exists if it finds that the United States is likely to prove that Denka's chloroprene emissions are presenting an imminent and substantial endangerment to public health. *See, e.g.*, *White v. Carlucci*, 862 F.2d 1209, 1211 (5th Cir. 1989) ("irreparable harm need not be proven if (1) the injunctive relief is sought pursuant to statute by the appropriate government officer or agency and (2) all of the statutory prerequisites are met"); *United States v. Hayes Int'l Corp.*, 415 F.2d 1038, 1045 (5th Cir. 1969); *see also Marine Shale Processors*, 81 F.3d at 1358-59 ("when the United States or a sovereign state sues in its capacity as protector of the public interest, a court may rest an injunction entirely upon a determination that the activity at issue constitutes a risk of danger to the public"). This presumption of *irreparable harm* logically flows from the predicate finding that an imminent and substantial *endangerment to public health or welfare* exists. *See Amoco Prod. Co. v. Vill. of Gambell, Alaska*, 480 U.S. 531, 545 (1987) ("[e]nvironmental injury, by its nature, can seldom be adequately remedied by monetary damages and is often permanent or at least of long duration, *i.e.*, irreparable"); *see also City of Painesville, Ohio*, 644 F.2d at 1194 (finding it "unnecessary" to hold a hearing to determine the presence of irreparable injury).

This presumption also serves Congress' intent that the environmental endangerment statutes, like 42 U.S.C. § 7603, should enhance courts' traditional equitable powers. *See United States v. Waste Indus., Inc.*, 734 F.2d 159, 165 (4th Cir. 1984). One manifestation of these enhanced powers is "a more lenient standard than the traditional requirement of threatened irreparable harm" to establish the need for a preliminary injunction. *See Price*, 688 F.2d at 211 (citing legislative history of the Safe Drinking Water Act and RCRA). As explained above, courts uniformly hold that it is not necessary to prove that actual harm to public health is occurring in order to establish that an endangerment exists. *See, e.g.*, *Cox*, 256 F.3d at 299; *see also Interfaith Comm. Org.*, 399 F.3d at 258. This more lenient standard for irreparable harm – *i.e.*, needing to show only threatened or potential harm – is therefore met if the United States proves it is likely to succeed on the merits of its claim that the unacceptably high lifetime excess cancer risks caused by breathing Denka's chloroprene emissions are an imminent and substantial endangerment to public health and welfare. *See id*.

Regardless of whether the Court presumes irreparable harm or engages in a more searching analysis of this *Winter* factor, the result is the same. The same facts that demonstrate the United States' likelihood of success on the merits – rapidly accumulating excess cancer risks caused by exposure to unacceptably high levels of a mutagenic carcinogen – also demonstrate that Parish residents will continue to suffer irreparable harm without the requested injunctive relief. And it is the irreparability of the threatened harm, not the magnitude of it, that should drive the Court's conclusion. *See Callaway*, 489 F.2d at 575.

Breathing chloroprene causes irreparable harm. *See Winter*, 555 U.S. at 22. It causes mutations in the DNA of the people breathing it. *See* Ex. F ¶¶s 34-36 and 43. No amount of money can reverse this harm – the lingering and latent biological mechanism by which breathing chloroprene increases cancer risk. *See Daniels Health Scis., L.L.C.*, 710 F.3d at 585 (defining irreparable harm as "harm for which there is no adequate remedy at law," such as monetary damages); *accord Janvey v. Alguire*, 647 F.3d 585, 600 (5th Cir. 2011). Like environmental damage, harm to public health and welfare can "seldom be adequately remedied by money damages and is often permanent or at least of long duration, i.e. irreparable." *Amoco*, 480 U.S. at 545; *see also Shell Offshore Inc. v. Greenpeace, Inc.*, 864 F. Supp. 2d 839, 851 (D. Alaska 2012) ("demonstrated risks to health and safety constitute the type of irreparable harm for which there is no adequate remedy at law.").

Without the requested injunction, the cancer risks that flow from Denka's mutagenic chloroprene emissions will continue. *See Monumental Task Comm., Inc.*, 157 F. Supp. 3d at 582-83 ("[p]erhaps the single most important prerequisite for the issuance of a preliminary injunction is a demonstration that if it is not granted the applicant is likely to suffer irreparable harm before a decision on the merits can be rendered"); *see also* Ex. D ¶¶s 69–70. Indeed, some of the highest short-term levels of chloroprene emitted from Denka's Facility were detected in just the past few months – for instance, a recent monitoring result at Denka's Western Site, just a few hundred feet from the Fifth Ward Elementary School, measured almost *600 times greater* than 0.2 ug/m^3 on a school day. *See* Ex. D ¶ 62. And the higher the average concentration of chloroprene people living near Denka's facility are exposed to, the faster their associated cancer risk will exceed "acceptable" levels. *See* Ex. D Attach. 10 & 11.

III. Congress' Statutory Priority to Protect Public Health and Welfare Tips the Balance of Equities in the United States' Favor

Congress chose unambiguous text in 42 U.S.C. § 7603 to express the "extraordinary weight" it places on the public interest at stake here – protecting public health and welfare from endangerments caused by air pollution like Denka's carcinogenic chloroprene emissions. *See*

Marine Shale Processors, 81 F.3d at 1358-59. 42 U.S.C. § 7603 authorizes action "[n]otwithstanding" any other part of the Clean Air Act. The statutory text thus puts a heavy "'congressional thumb on the scale'" in favor of protecting the public health and welfare of Parish residents. *See Mallinckrodt, Inc.*, 471 F.3d at 296-97;[23] *Amoco*, 480 U.S. at 545. That thumb definitively tips the balance of equities required under *Winter* in the United States' favor, even though the Court can grant the requested preliminary injunction without a balancing of the equities. *See, e.g.*, *Amoco*, 480 U.S. at 545 (if environmental injury is sufficiently likely, "the balance of harms will usually favor the issuance of an injunction"); *cf. Winter*, 555 U.S. at 20.[24]

Even without any presumption, the equities favor the United States here. Protecting thousands of Parish residents from the ongoing public health threats from Denka's chloroprene emissions outweighs any financial costs or inconvenience to Denka contemplated by the United States' requested relief. *See Andritz Sundwig GmbH v. United States*, Civ. No. 4:18-2061, 2018 WL 3218006, at *11 (S.D. Tex. 2018) (government interest in protecting pine forests "heavily outweighs" any financial harm to company); *United States v. Gear Box Z Inc.*, 526 F. Supp.3d 522, 529 (D. Ariz. 2021) (financial loss to company from government injunction does not outweigh the harm to human health and the environment at issue); *League of Wilderness Def. v.*

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[23] *Mallinckrodt, Inc.* involves a permanent, not preliminary, injunction. But the standards are "'essentially the same.'" *4 Aces Enterprises, LLC v. Edwards*, 479 F. Supp.3d 311, 322 (E.D. La. 2020) (*quoting Winter*, 555 U.S. at 32).

[24] Several courts have explained that "when the plaintiff is a governmental entity…and the activity may endanger public health, injunctive relief is proper without undertaking a balancing of the equities." *United States v. Prod. Plated Plastics, Inc.*, 762 F. Supp. 722, 728 (W.D. Mich. 1991); *see also United States v. Bethlehem Steel Corp.*, 38 F.3d 862, 867-68 (7th Cir. 1994) (finding that it was "not improper for the district court to have awarded injunctive relief … without conducting an equitable balancing."); *U.S. Envtl. Prot. Agency v. Envtl. Waste Control, Inc.*, 917 F.2d 327, 332 (7th Cir. 1990) ("where the plaintiff is a sovereign and where the activity may endanger the public health, 'injunctive relief is proper, without resort to balancing.'"); *Envtl. Def. Fund, Inc. v. Lamphier*, 714 F.2d 331, 337-38 (4th Cir. 1983).

Forsgren, 184 F. Supp. 2d 1058, 1070-71 (D. Or. 2002) (*potential* harm to environment outweighs even a *certain* financial loss). It is also technically feasible for Denka to comply with the preliminary injunction, which requires specific actions that are focused on reducing the Facility's chloroprene emissions. *See* Ex. G ¶¶s 30, 46, 48-55, 58, 60-61, 63-67, 72-73, 76-79, 84, 86-88, and 90-92. And Denka has not revealed that it is financially unable to do so.[25] The required actions will cost money, more than what Denka has already commendably spent to reduce chloroprene emissions since purchasing the Facility. But the actions under the 2017 State AOC were simply not enough to end the endangerment that the Facility's chloroprene emissions continue to cause.

Parish residents have few viable alternatives to reduce the cancer risks they are exposed to because of Denka's chloroprene emissions. They should not be forced to choose between continuing to suffer these risks or fleeing their homes in order to escape them. Some people have lived in their homes for years. *See* Ex. C ¶¶s 49 and 50. The balance of equities tips in the United States' favor.

IV. The Injunction is in the Public Interest

Fifth Circuit law allows this Court to rest injunction entirely upon a determination that activity at issue constitutes a risk of danger to the public. *See Marine Shale Processors*, 81 F.3d at 1359. Nevertheless, for many of the reasons already discussed, the United States' requested preliminary injunction is in the public interest. *See Winter*, 555 U.S. at 20 and 26.

[25] The Court may consider the finances of Denka's parent companies – Mitsui & Co. Ltd. ("Mitsui") and Denka Company Limited ("Denka Ltd.") – when assessing Denka's ability to finance the requested relief. Courts may consider the financial condition of a parent company when evaluating the economic impact of, for example, assessing a civil penalty, even where the parent is not a named party to the action and the corporate veil has not been pierced. *See, e.g.*, *United States v. Allegheny Ludlum Corp*., 187 F. Supp. 2d 426, 442 (W.D. Pa. 2002), *rev'd in part on other grounds*, 366 F.3d 164 (3d Cir. 2004) (assessing Clean Water Act penalty); *United States v. Munic. Auth. of Union Twp.*, 150 F.3d 259, 268 (3d Cir. 1998) (same).

"Enforcement of the environmental laws is in the public interest." *Matter of Commonwealth Oil Ref. Co., Inc.*, 805 F.2d 1175, 1190 (5th Cir. 1986). Issuing the preliminary injunction serves both the specific interest expressed in 42 U.S.C. § 7603 and the Clean Air Act's overarching purpose as expressed in 42 U.S.C. § 7401(b)(1). Reducing unacceptably high cancer risks to infants, children, and adults in St. John the Baptist Parish fully aligns with "protect[ing] and enhance[ing] the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." 42 U.S.C. § 7401(b)(1). The Court's action is needed here to guard that public interest.

CONCLUSION

For these reasons, the United States asks this Court to grant this motion and issue the proposed Preliminary Injunction Order.

Respectfully submitted,

FOR THE UNITED STATES OF AMERICA

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EXHIBIT D

Denka, *Results Presentation of FY2023* (May 10, 2024)

Denka

Possibility
of
chemistry

Results Presentation of FY2023

(Fiscal Year Ended March 2024)

Securities code: 4061

Denka Co., Ltd

May 10, 2024

Announcement of New Regulations set by the U.S. Environmental Protection Agency That Apply to Chloroprene Rubber Manufacturing Facilities in the U.S.

Denka

■ **The EPA emission regulations will have a significant impact on whether Denka Performance Elastomer (DPE) will be able to continue operations in the U.S. DPE is considering all possible responses, including taking legal actions seeking a revision of the regulations.**

(Press release) ・April 17 2024: Announcement of New Regulations set by the U.S. Environmental Protection Agency that apply to Chloroprene Rubber Manufacturing Facilities in the U.S.
https://www.denka.co.jp/eng/storage/news/pdf/490/20240417_denka_dpe_en.pdf

Details and Company Response

Details	・April 9, 2024 (local time) U.S. Environmental Protection Agency (EPA) announces new chemical air emission regulations applicable to chloroprene rubber manufacturing facilities in the U.S., including facilities operated by DPE ・Details of the rules call for significant reductions in chloroprene monomer emissions ・The rules take effect 60 days from publication of the rules in the federal register, and the grace period for compliance is 90 days from the date of effect (Date of publication in the federal register: Not published as of now)
Company Response	・The Company is considering all possible measures to have the new regulations revised, including taking the matter to the U.S. Court of Appeals ・We are carefully investigating the impact the regulations will have on DPE chloroprene rubber manufacturing operations and financial results

* DPE: Denka Performance Elastomer LLC, a U.S. chloroprene rubber manufacturing subsidiary

Denka

FY2023 Results (P4-P13)	■ Operating income: 13.4 billion yen -18.9 billion yen year on year ■ Net income: 11.9 billion yen -0.8 billion yen year on year Gain on sale of strategic cross-shareholdings +12.5 billion yen (FY2022 +5.0 billion yen → FY2023 +17.4 billion yen) Portfolio transformation +10.9 billion yen (FY2022 -17.7 billion yen → FY2023 -6.8 billion yen) *FY2022: Recorded an extraordinary loss due to the withdrawal from the cement business; FY2023: Recorded an impairment loss on goodwill, etc., related to Icon Genetics due to termination of norovirus vaccine development
FY2024 Earnings Forecast (P14-P25)	■ Operating income: 18.0 billion yen +4.6 billion yen year on year ■ Net income: 9.0 billion yen -2.9 billion yen year on year We have not factored in the impact of drastic measures for the chloroprene rubber business planned for announcement during 2024
Shareholder Returns (P26)	■ Maintain 100 yen per share dividend, the same as the previous year, taking into account the impact drastic measures in the chloroprene rubber business to be announced during 2024, cash flow improvement for FY2025 and beyond, etc. (total return ratio of 96%) ■ Future dividend policy: Aiming to maintain or increase dividend per share based on a total return ratio of 50% (cumulative total for the eight years of the management plan)
Response to Changed Assumptions Under Mission 2030 Management Plan (P27-P32)	■ A positive shareholder return policy, carefully selected strategic investments (reduce investment plan by 100 billion yen cumulatively over eight years), portfolio transformation, and best practice project ■ Return performance to a growth trajectory in the second half of FY2024, while maintaining a steady D/E ratio of 0.6x to 0.8x

FY2023 Results

a) Summary (Year on Year, vs Forecast as of February)

Denka

■ **Operating income decreased year on year due to slowing demand and other factors, net income was impacted by the posting of a 17.4 billion yen gain on the sale of strategic cross-shareholdings and a 6.8 billion yen impairment loss due to the termination of norovirus vaccine development**

(¥ billions)	FY2022 Actual	FY2023 Actual	(Year on Year)	FY2023 Forecast as of February	(vs Forecast as of February)
Sales	407.6	**389.3**	- 18.3	380.0	+ 9.3
Operating Income	32.3	**13.4**	- 18.9	11.0	+ 2.4
Operating Margin	7.9%	**3.4%**	- 4.5%	2.9%	+ 0.5%
Ordinary Income	28.0	**5.5**	- 22.6	3.0	+ 2.5
Net Income Attributable to Owners of Parent	12.8 *1	**11.9** *2	- 0.8	11.0	+ 0.9
Forex (¥/$)	135.1 (1H: 131.6 2H: 138.6)	**143.8** (1H: 139.9 2H: 147.7)		142.8	
Japan Naphtha (¥/Kl)	76,500 (1H: 82,850 2H: 69,400)	**69,000** (1H: 65,450 2H: 72,550)		68,500	

*1 Extraordinary Losses due to withdrawal from cement business -17.7 billion yen
Gain on sale of strategic cross-shareholdings +5.0 billion yen

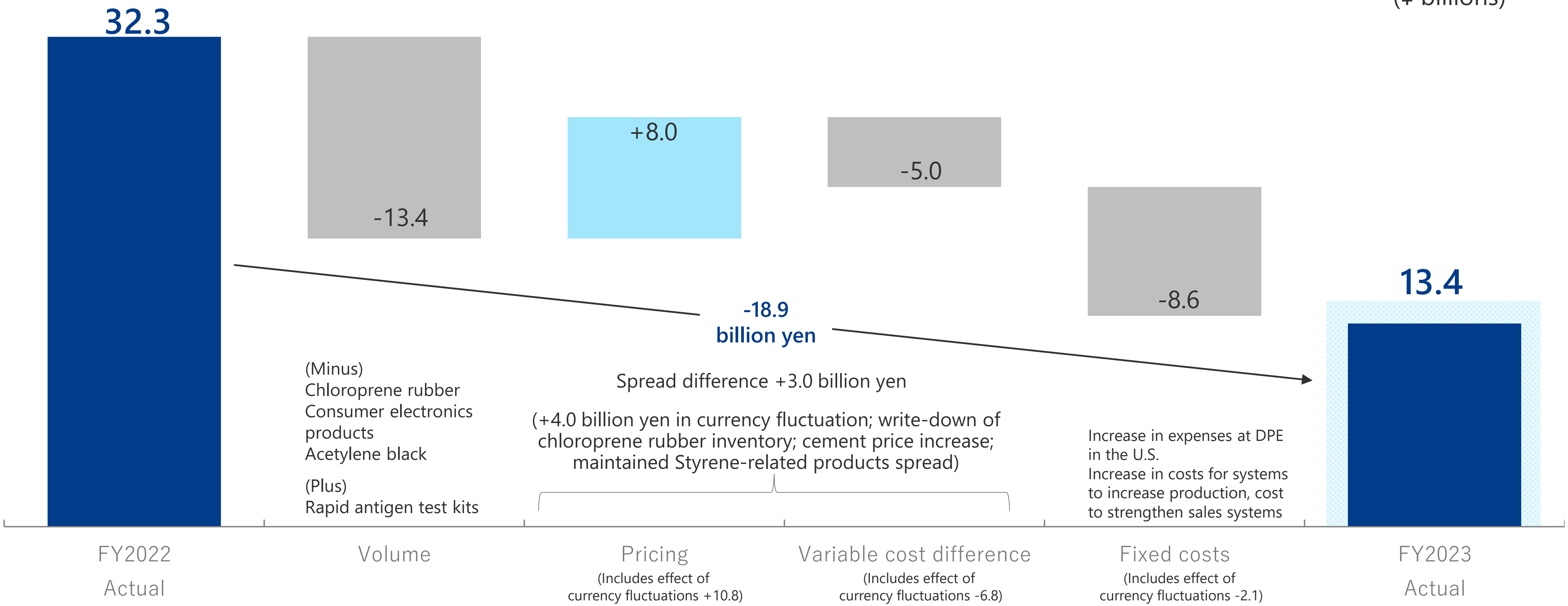
*2 Gain on sale of strategic cross-shareholdings: +17.4 billion yen
Impairment loss on goodwill, etc., related to Icon Genetics due to termination of norovirus vaccine development -6.8 billion yen
Restoration costs for facilities, etc., due to the Noto Peninsula earthquake -0.9 billion yen

Denka

■ Significantly lower profits due to lower sales volumes with lower demand, as well as higher fixed costs

Operating Income Variance Analysis
(Year on Year)

(¥ billions)



Denka

■ **Profit declined significantly year on year for Electronics & Innovative Products, as well as Elastomers & Infrastructure Solutions**

(¥ billions)

Sales	FY2022	FY2023	Incr. Decr.	Volume	Pricing
Electronics & Innovative Products	93.5	**87.8**	- 5.7	- 9.2	+ 3.5
Life Innovation	47.5	**47.1**	- 0.4	- 0.5	+ 0.0
Elastomers & Infrastructure Solutions	123.8	**111.4**	- 12.5	- 19.1	+ 6.6
Polymer Solutions	127.6	**124.2**	- 3.3	- 1.3	- 2.1
Others	15.1	**18.8**	+ 3.7	+ 3.7	-
Total	407.6	**389.3**	- 18.3	- 26.3	+ 8.0

Operating Income	FY2022	FY2023	Incr. Decr.	Volume	Pricing	Cost and Other
Electronics & Innovative Products	18.0	**9.0**	- 9.0	- 5.1	+ 3.5	- 7.4
Life Innovation	14.4	**11.7**	- 2.6	- 0.1	+ 0.0	- 2.6
Elastomers & Infrastructure Solutions	- 1.1	**-9.3**	- 8.2	- 6.9	+ 6.6	- 7.8
Polymer Solutions	-1.2	**-0.1**	+ 1.1	- 1.0	- 2.1	+ 4.2
Others	2.3	**2.0**	- 0.3	- 0.3	-	+ 0.0
Total	32.3	**13.4**	- 18.9	- 13.4	+ 8.0	- 13.6

d) Operating Income Change Factors by Segment (vs. FY2023 3Q)

Denka

■ Lower Life Innovation and Polymer Solutions profit compared to 3Q, profit decreased overall

(¥ billions)

Sales	FY2022 1Q	2Q	3Q	4Q	FY2023 1Q	2Q	3Q	4Q	Vs. 3Q	
Electronics & Innovative Products	21.9	25.6	22.3	23.8	19.2	22.5	21.7	**24.5**	+	2.9
Life Innovation	6.4	15.5	16.9	8.8	7.2	15.0	15.8	**9.0**	-	6.8
Elastomers & Infrastructure Solutions	30.4	32.5	31.6	29.3	28.0	29.2	28.6	**25.6**	-	3.0
Polymer Solutions	31.6	32.0	30.3	33.7	29.8	31.7	30.9	**31.9**	+	1.0
Others	4.1	2.9	4.7	3.4	3.7	5.1	4.5	**5.4**	+	0.9
Total	94.4	108.6	105.8	98.8	87.8	103.5	101.5	**96.4**	-	5.1

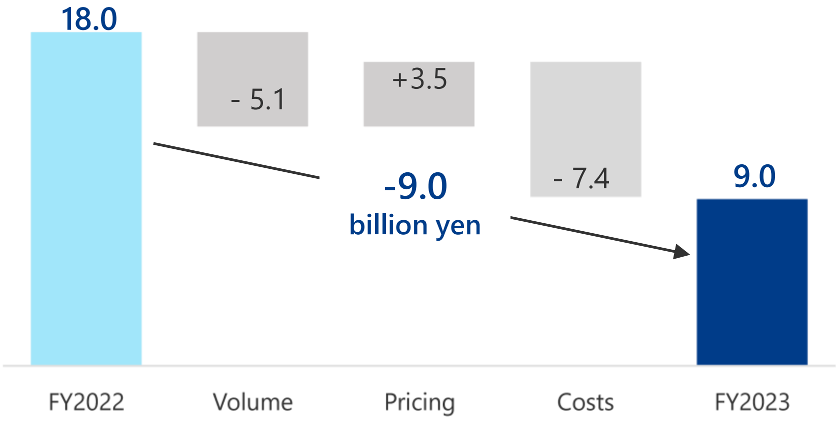
Operating Income	FY2022 1Q	2Q	3Q	4Q	FY2023 1Q	2Q	3Q	4Q	Vs. 3Q	
Electronics & Innovative Products	4.1	5.6	4.1	4.2	2.1	2.8	1.8	**2.4**	+	0.6
Life Innovation	0.5	6.0	5.0	2.8	0.9	5.7	3.1	**2.0**	-	1.1
Elastomers & Infrastructure Solutions	-0.2	1.5	-1.3	-1.1	-0.7	-0.9	-3.9	**-3.7**	+	0.2
Polymer Solutions	-0.1	-0.0	-0.9	-0.1	-0.0	-0.2	0.6	**-0.4**	-	1.1
Others	0.6	0.4	0.9	0.4	0.5	0.5	0.4	**0.6**	+	0.2
Total	4.9	13.4	7.8	6.3	2.8	7.7	2.0	**0.8**	-	1.2

Denka

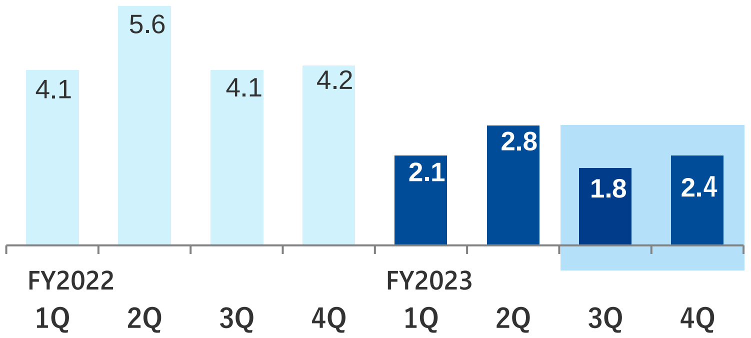
■ **Profit declined significantly due to major decrease in demand for consumer electronics (smartphones, PCs) in FY2022 3Q, weak demand for high-voltage cables, and cost increases beginning**

Operating Income Variance Analysis (Year on Year)

(¥ billions)



(Reference) Operating Income by Quarter



4Q Non-Consolidated (vs. 3Q)
・Acetylene black:High-voltage cables are shipped in batches to a certain extent, resulting in shipments increased in 4Q due to differences in timing for said shipments
・Spherical alumina: Shipments increased with recovery in demand
・Ceramic substrates: Shipments decreased due to design changes among major users

(Page 200 of Total)

Reason for Variance (Year on Year)

	Sales	Volume	Semiconductor and Electronic Components (By Application)	xEV (By Application)	Other (By Application)	Pricing	
Spherical Alumina	↘	↘	(TIM* applications) ・Lower YoY as demand for consumer electronics, which had plummeted in FY2022 3Q, continued to decline in FY2023	・Level YoY with a slowdown in European and U.S. EV market growth, which account for a high percentage of total sales, and other factors		↗	Currency fluctuation : Plus
Spherical Fused Silica	↘	↘	(Semiconductor sealants) Same as above			↗	Same as above
High-Performance Film	→	→	・For semiconductors, same as above. ・For electronic component applications, gradual recovery as inventories in the market are worked down ・Overall, sales largely in line with the previous year			↗	Same as above
Acetylene Black	↘	↘		Same as above	・Demand for high-voltage cables in Europe declined due to construction delays; demand for high-voltage cables in China also weakened	↗	Same as above
Ceramic Substrates (silicon nitride, aluminum nitride)	→	→		・Demand recovered and shipments were higher YoY	・Sales for electric railway applications were on a par with the previous year	↗	Same as above
Cost and Other	↓	Increase in costs for systems to raise production, and costs to strengthen sales systems					

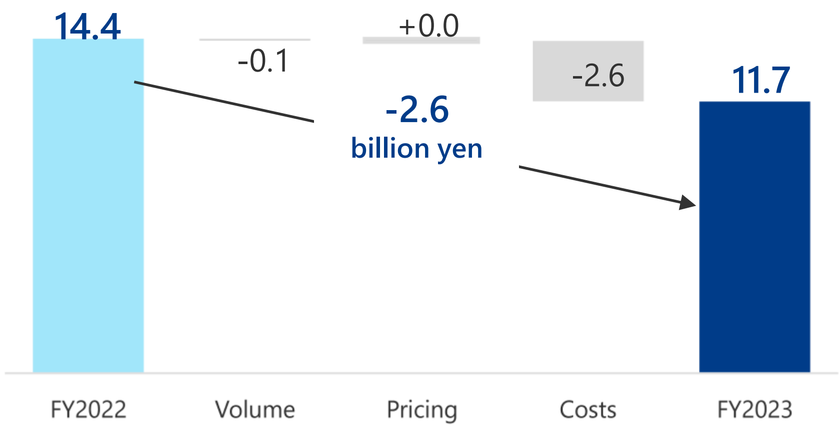
*TIM (Thermal Interface Materials)

Denka

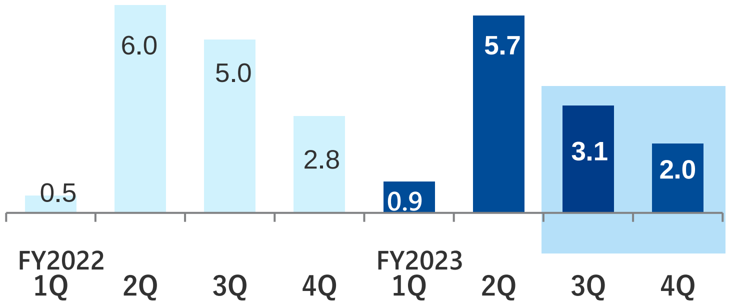
■ Profit decreased, despite an increase in demand for simultaneous test kits for COVID 19 and influenza (combo kits), due to cost increases, etc.

Operating Income Variance Analysis (Year on Year)

(¥ billions)



(Reference) Operating Income by Quarter



4Q Non-Consolidated (vs. 3Q)
Influenza vaccine: Sales completed by 3Q as normal;
rapid antigen test kit: sales volume down

Reason for Variance (Year on Year)

	Sales	Volume		Pricing	
Influenza Vaccine	→	→	・Assuming that the number of vaccinations would return to normal, we manufactured 10 million vaccines, an increase from the previous year, but the vaccination rate did not increase and remained at the same level as the previous year	→	
Rapid Antigen Test Kits	↗	↗	・Higher shipments of simultaneous test kits for COVID 19 and influenza (combo kits) due to the spread of influenza	→	・Maintained prices after the downgrade of COVID-19 to a Class 5 infectious disease
IVD Reagents (Inflammation markers, etc.)	→	→	・Largely unchanged from last year	→	

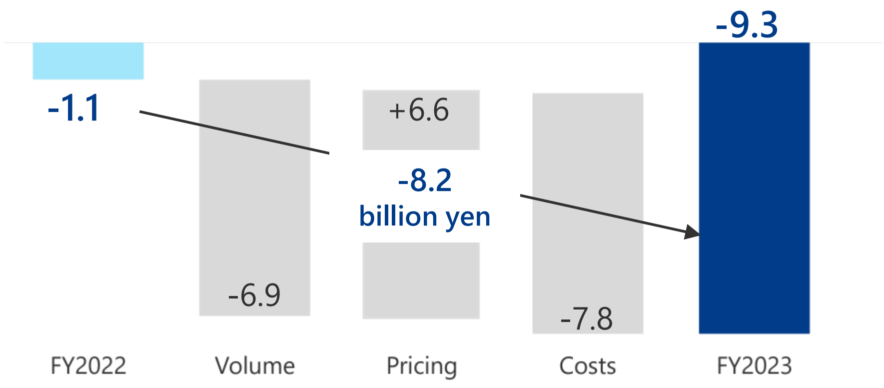
Cost and Other ↘ Soaring prices of raw materials for influenza vaccines, R&D expenses, etc.

Denka

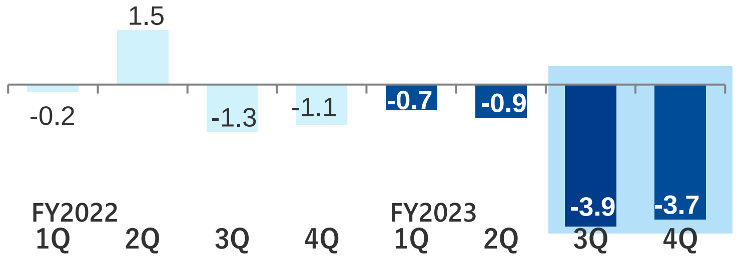
■ Profit decreased significantly with weak demand for chloroprene rubber, cost increases, including repairs and labor costs at DPE in the U.S., and inventory valuation write-downs

Operating Income Variance Analysis (Year on Year)

(¥ billions)



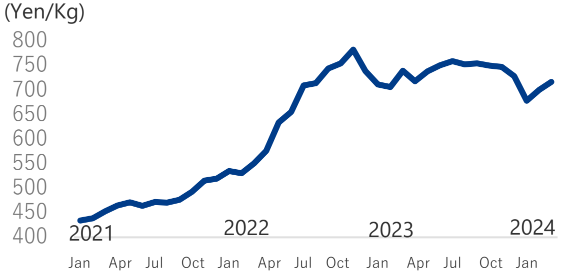
(Reference) Operating Income by Quarter



4Q Non-Consolidated (vs. 3Q):
・Posted chloroprene rubber inventory write-down in 3Q.
Chloroprene rubber in the 4Q:
Impact of Noto Peninsula earthquake on sales: -1.1 billion yen

Reason for Variance (Year on Year)

	Sales	Volume		Pricing	
Chloroprene Rubber	↘	↓	・Shipments falling below the previous year due to lower demand from FY2022 3Q for applications in industry and adhesives, as well as ongoing adjustments to market inventories in automobiles despite recovery in demand	↗	・Currency fluctuation: Plus ・Impact excluding currency fluctuations: Flat year on year Flat YoY, as, despite gradual price hikes in FY2022, sales prices fell in FY2023 due to intensified competition from products of other companies [Customs Statistics] Export unit prices (dry + latex)
Special Cement Additives	→	→	Largely unchanged from last year	→	
Cement	→	→	Largely unchanged from last year	↗	・Despite delays, the 3,000 yen/ton additional price hike, was essentially complete as of July 31, 2023



Cost and Other ↓

Increase in repair, labor, and other costs at DPE in the U.S.[*1], write-down on valuation of chloroprene rubber inventory[*2]

[*1] DPE: Denka Performance Elastomer LLC, a U.S. chloroprene rubber manufacturing subsidiary

[*2] Posted write-down due to lower utilization capacity caused by a decrease in demand, as well as higher costs at DPE in the U.S.

Coal prices fell (FY2022: $392/t ⇒ FY2023: $161/t)

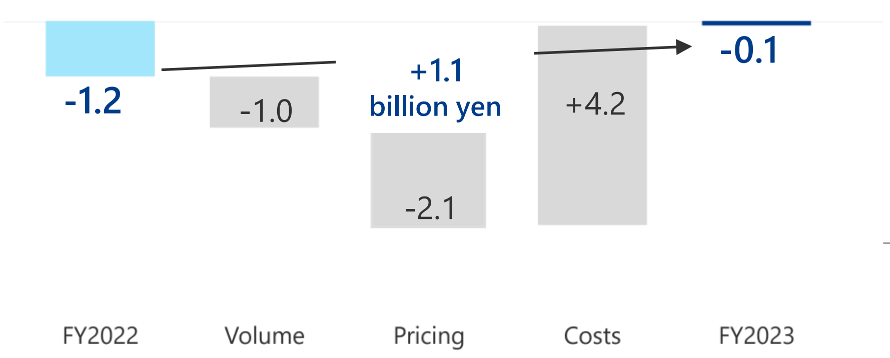
e) Polymer Solutions (Year on Year)

Denka

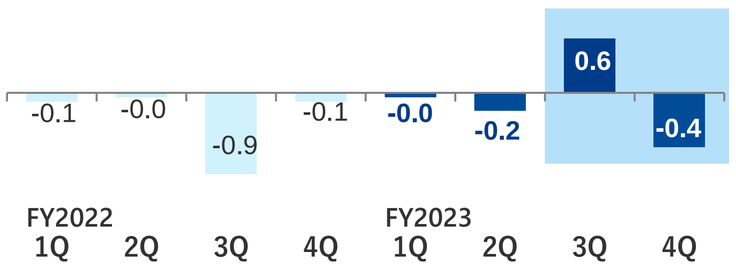
■ **Profit improved, despite weak demand, since we maintained spreads and fixed costs decreased due to a non-scheduled maintenance year for the styrene monomer plant**

Operating Income Variance Analysis (Year on Year)

(¥ billions)



(Reference) Operating Income by Quarter



4Q Non-Consolidated (vs. 3Q):
Certain products incorporating a formula for unit sales prices experienced a timing variance in sales price adjustments

Reason for Variance (Year on Year)

	Sales	Volume		Pricing	
MS Resin	↗	↗	Higher YoY as demand for LGP applications for PC monitors, which had been weak in FY2022, recovered gradually	↘	Styrene Related Product: Price revision in conjunction with falling raw materials and fuel prices
AS, ABS, Transparent Resins, Etc.	→	→	Level YoY, as demand for consumer electronics, cosmetics containers, general merchandise, etc., which began weakening in FY2022, continued to decline in FY2023 due to overall sluggishness in the global economy	↘	
Food Wrapping Sheets and Containers	↘	↘	Lower YoY, with declining demand for ready-made meals due to food price hikes	↘	
Toyokalon	→	→	Largely unchanged YoY due to continuing weakness in purchasing power in African and U.S. markets due to inflation, which began in FY2022	↘	

Cost and Other ↑ Variable costs: Improved due to lower raw material and fuel prices (spread maintained)
Fixed costs: Improved due to a non-scheduled maintenance year for the styrene monomer plant

f) By Segment (vs Forecast as of February)

Denka

■ **Elastomers & Infrastructure Solutions performance exceeded the February forecast, as we maintained chloroprene rubber sales prices and recorded a smaller inventory write-down as a result**

(¥ billions)

Sales	FY2023 Forecast as of February	**FY2023 Actual**	Incr. Decr.	Volume	Pricing
Electronics & Innovative Products	85.0	**87.8**	+ 2.8	+ 2.6	+ 0.3
Life Innovation	45.0	**47.1**	+ 2.1	+ 2.3	- 0.2
Elastomers & Infrastructure Solutions	110.0	**111.4**	+ 1.4	+ 0.8	+ 0.5
Polymer Solutions	125.0	**124.2**	- 0.8	- 1.6	+ 0.8
Others	15.0	**18.8**	+ 3.8	+ 3.8	-
Total	380.0	**389.3**	+ 9.3	+ 7.9	+ 1.4

Operating Income	FY2023 Forecast as of February	**FY2023 Actual**	Incr. Decr.	Volume	Pricing	Cost and Other
Electronics & Innovative Products	8.5	**9.0**	+ 0.5	+ 0.1	+ 0.3	+ 0.2
Life Innovation	12.0	**11.7**	- 0.3	+ 0.1	- 0.2	- 0.1
Elastomers & Infrastructure Solutions	-10.5	**-9.3**	+ 1.2	- 0.2	+ 0.5	+ 0.9
Polymer Solutions	-0.5	**-0.1**	+ 0.4	+ 0.1	+ 0.8	- 0.5
Others	1.5	**2.0**	+ 0.5	+ 0.5	-	- 0.0
Total	11.0	**13.4**	+ 2.4	+ 0.5	+ 1.4	+ 0.5

FY2024 Earnings Forecast

Denka

■ The first half will continued sluggishness from FY2023, operating profit is expected to increase as a gradual recovery is factored in from the second half

(¥ billions)	FY2023 Actual	FY2024 Forecast	Incr. Decr.	FY2024 1H Forecast (Apr-Sep)	FY2024 2H Forecast (Oct-Mar)
Sales	389.3	420.0	+ 30.7	200.0	220.0
Operating Income	13.4	18.0	+ 4.6	8.5	9.5
Operating Margin	3.4%	4.3%	+ 0.8%	4.3%	4.3%
Ordinary Income	5.5	12.0	+ 6.5	5.0	7.0
Net Income Attributable to Owners of Parent	11.9*	9.0	- 2.9	4.0	5.0
Forex (¥/$)	143.8 (1H: 139.9 2H: 147.7)	148.0		148.0	148.0
Japan Naphtha (¥/Kl)	69,000 (1H: 65,450 2H: 72,550)	77,600		77,600	77,600

*Impairment loss on goodwill, etc., of -6.8 billion yen related to Icon Genetics due to termination of norovirus vaccine development
Restoration costs for facilities, etc., due to the Noto Peninsula earthquake -0.9 billion yen
Gain on sale of strategic cross-shareholdings +17.4 billion yen

Denka

■ Demand for consumer electronics and xEV should recover gradually beginning in the second half of the year

Weather Symbols (Good) → (Bad)

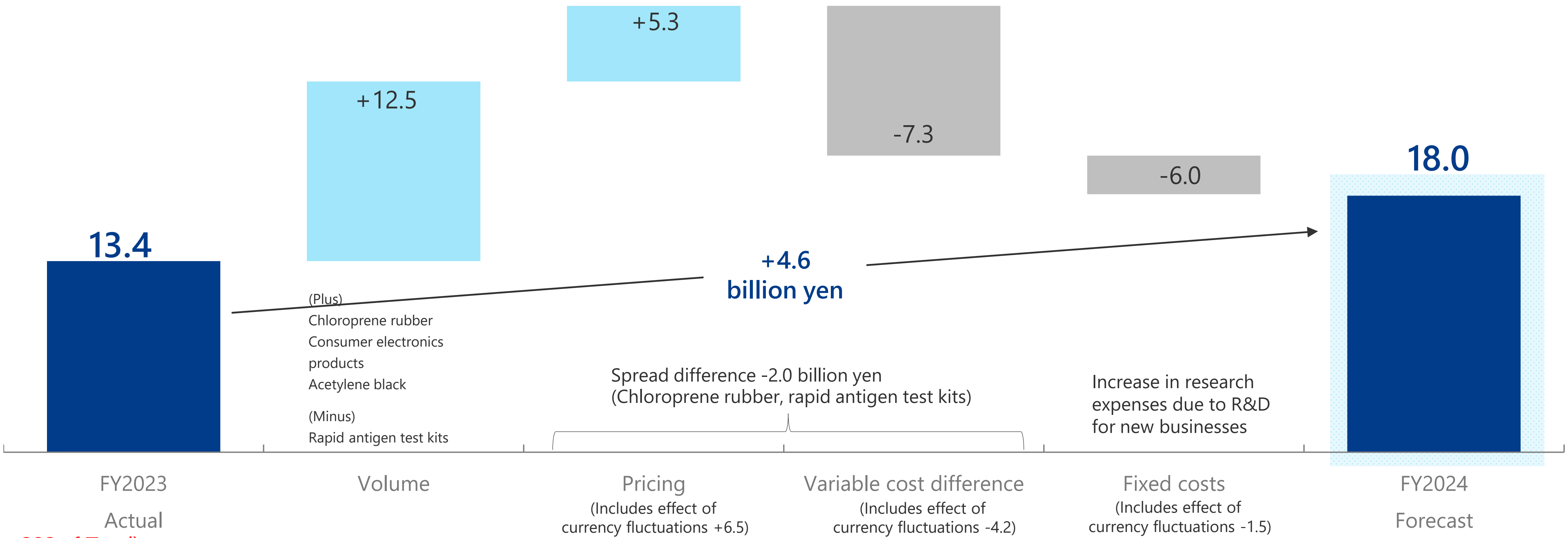
	(Market Trends)	FY2023 Actual	FY2024 Forecast
Electronics & Innovative Products	Semiconductor and Electronic Components (including automotive)	Automotive-Related: Gradual recovery Consumer Electronics: Electronic components and semiconductors for other than memory should see a moderate recovery beginning in the second half; recovery likely to lag for memory-related	Automotive-Related: Moderate recovery continuing from 2023 Consumer Electronics: Electronic components and semiconductors for other than memory should see a moderate recovery; demand to recover in the second half for memory and expand further for generative AI
	xEV	・Recovery trajectory since FY2022 ・However, the growth rate of EV in Europe and the U.S. is slower than EV in China (our products account for a high percentage of sales in Europe and the U.S.)	・Growth slower than expected due to reduced EV subsidies in Europe, etc., but the market growth trend itself should continue ・However, the growth rate of EV in Europe and the U.S. is slower than EV in China (our products account for a high percentage of sales in Europe and the U.S.)
Life Innovation	Infectious Disease Testing (e.g., COVID-19, influenza)	・An influenza pandemic continued throughout the year, as did COVID-19, increasing the demand for testing in Japan ・No revisions to COVID-19 insurance points	・Influenza infections to return to normal levels ・Assuming FY2023 levels for COVID-19 ・COVID-19 insurance point reduction (revised June 1, 2024) COVID-19 alone: 300 points → 150 points Combo: 420 points → 225 points
Elastomers & Infrastructure Solutions	Chloroprene Rubber	・Global chloroprene rubber demand was 220,000 tons Ongoing weakness in demand for applications in industry and adhesives as well as ongoing adjustments to market inventories in automobiles despite recovery in demand ・Sales prices lower gradually due to intensifying competition with the products of other companies beginning during the current fiscal year	・Global demand for chloroprene rubber expected to be 230,000 tons Gradual recovery in demand beginning in the second half ・Further decline in sales prices continuing from FY2023
Polymer Solutions	Resin	Demand for LGP applications for PCs and home electronics on a recovery trajectory; however, demand for other applications remained sluggish General Merch.: Demand remained sluggish Food Containers: Decreased in demand in the ready-made meal market with further rising food prices	Steady demand for LGP applications for PCs and home appliances, moderate recovery in other applications General Merch.: Demand to remain sluggish Food Containers: Wage increases have not kept pace with higher prices, and demand likely to remain weak in the ready-made market

Denka

- Recovery in sales volume likely to be limited as demand will not recover until the second half of the fiscal year. In addition, we do not expect a recovery to FY2021 profit levels (record-high levels) yet due to worsening spreads and increased fixed costs

**Operating Income Variance Analysis
(Year on Year)**

(¥ billions)



Denka

■ **Despite expectations for decreased profits in Life Innovation, we expect profits to improve in Electronics & Innovative Products and Elastomers & Infrastructure Solutions.**

(¥ billions)

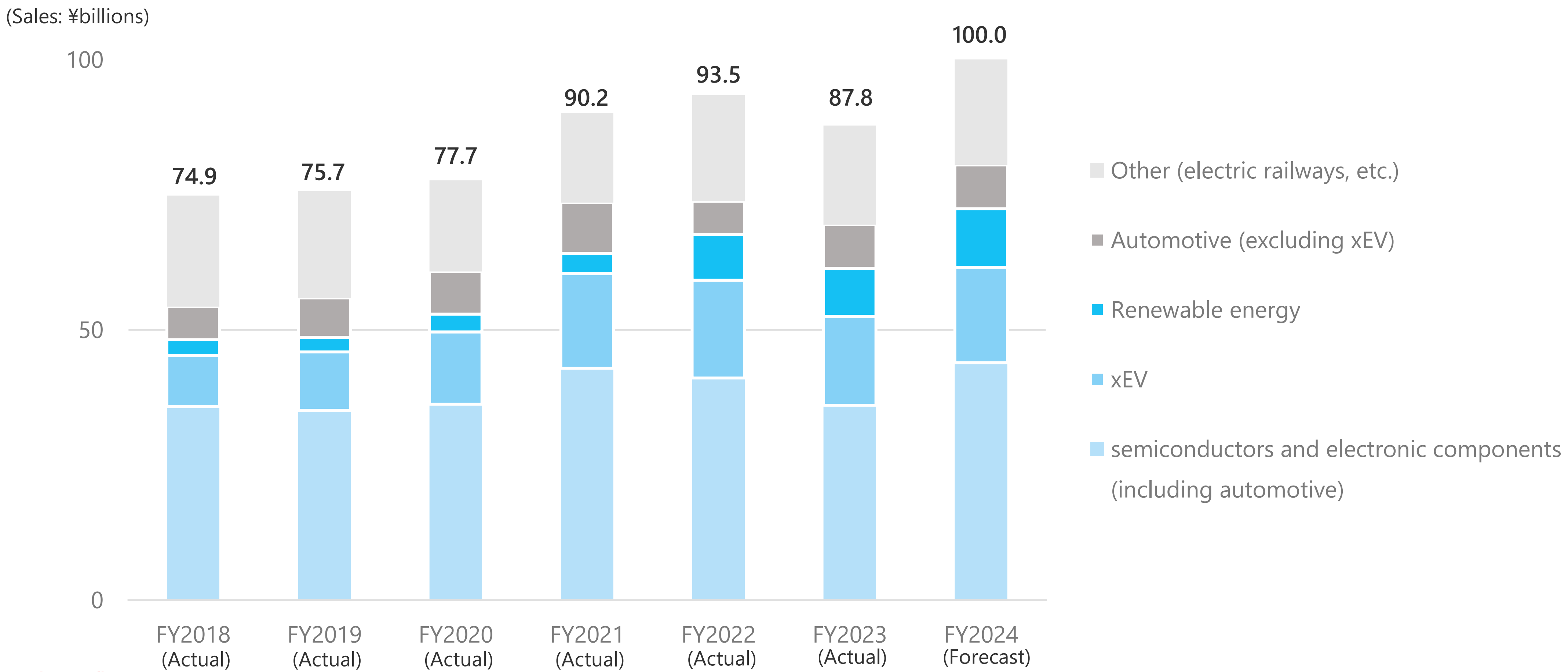
Sales	FY2023 Actual	FY2024 Forecast	Incr. Decr.	Volume	Pricing
Electronics & Innovative Products	87.8	**100.0**	+ 12.2	+ 11.1	+ 1.1
Life Innovation	47.1	**45.0**	- 2.1	- 0.4	- 1.7
Elastomers & Infrastructure Solutions	111.4	**120.0**	+ 8.6	+ 12.5	- 3.8
Polymer Solutions	124.2	**135.0**	+ 10.8	+ 1.0	+ 9.8
Others	18.8	**20.0**	+ 1.2	+ 1.2	-
Total	389.3	**420.0**	+ 30.7	+ 25.4	+ 5.3

Operating Income	FY2023 Actual	FY2024 Forecast	Incr. Decr.	Volume	Pricing	Cost and Other
Electronics & Innovative Products	9.0	**12.0**	+ 3.0	+ 6.2	+ 1.1	- 4.2
Life Innovation	11.7	**9.0**	- 2.7	- 0.5	- 1.7	- 0.5
Elastomers & Infrastructure Solutions	-9.3	**-5.5**	+ 3.8	+ 5.5	- 3.8	+ 2.1
Polymer Solutions	-0.1	**0.5**	+ 0.6	+ 1.4	+ 9.8	- 10.6
Others	2.0	**2.0**	- 0.0	- 0.0	-	+ 0.0
Total	13.4	**18.0**	+ 4.6	+ 12.5	+ 5.3	- 13.2

Denka

■ **Recovery is likely to be delayed;**
however, business growth in megatrending semiconductors, xEV, and renewable energy

Sales Composition by Application

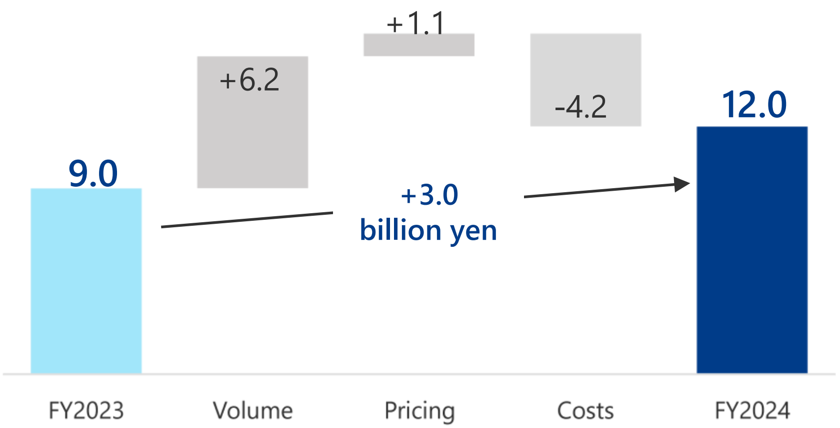


Denka

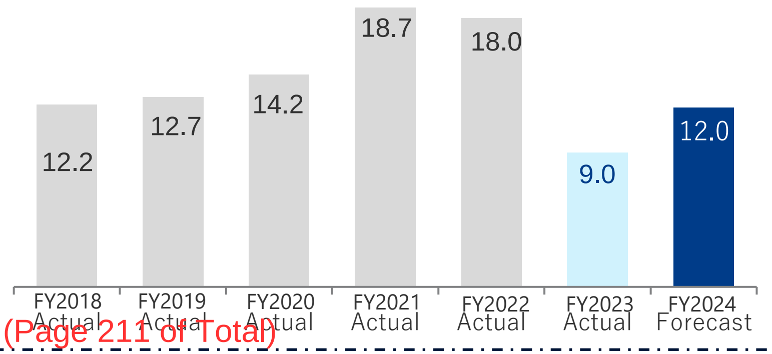
■ We expect demand recovery for both consumer electronic and xEV applications to be limited. In addition, we do not expect a recovery to FY2021 profit levels yet due to increased costs.

Operating Income Variance Analysis (Year on Year)

(¥ billions)



(Reference) Operating Income



Reason for Variance (Year on Year)

	Sales	Volume	(By Application) Semiconductor and Electronic Components	xEV	Other	Pricing
Spherical Alumina	↗	↗	(TIM applications) ・Demand recovery (semiconductor sealants) ・Demand for generative AI likely to increase	・Increased demand accompanying the expansion of the market, despite a slowdown in the growth rate of EV in Europe and the U.S., which account for a high percentage of total sales		→
Spherical Fused Silica	↗	↗	(semiconductor sealants) ・Demand recovery beginning in 2H			→
High-Performance Film	↗	↗	Same as above			→
Acetylene Black	↗	↗		Same as above	・Increased demand for high-voltage cables, despite construction delays for Europe, as demand in North America is likely to increase in response to inflation control laws	→
Ceramic Substrates (silicon nitride, aluminum nitride)	↘	↘		・Lower YoY due to design changes among major users	・Sales for electric railway applications were on a par with the previous year	→

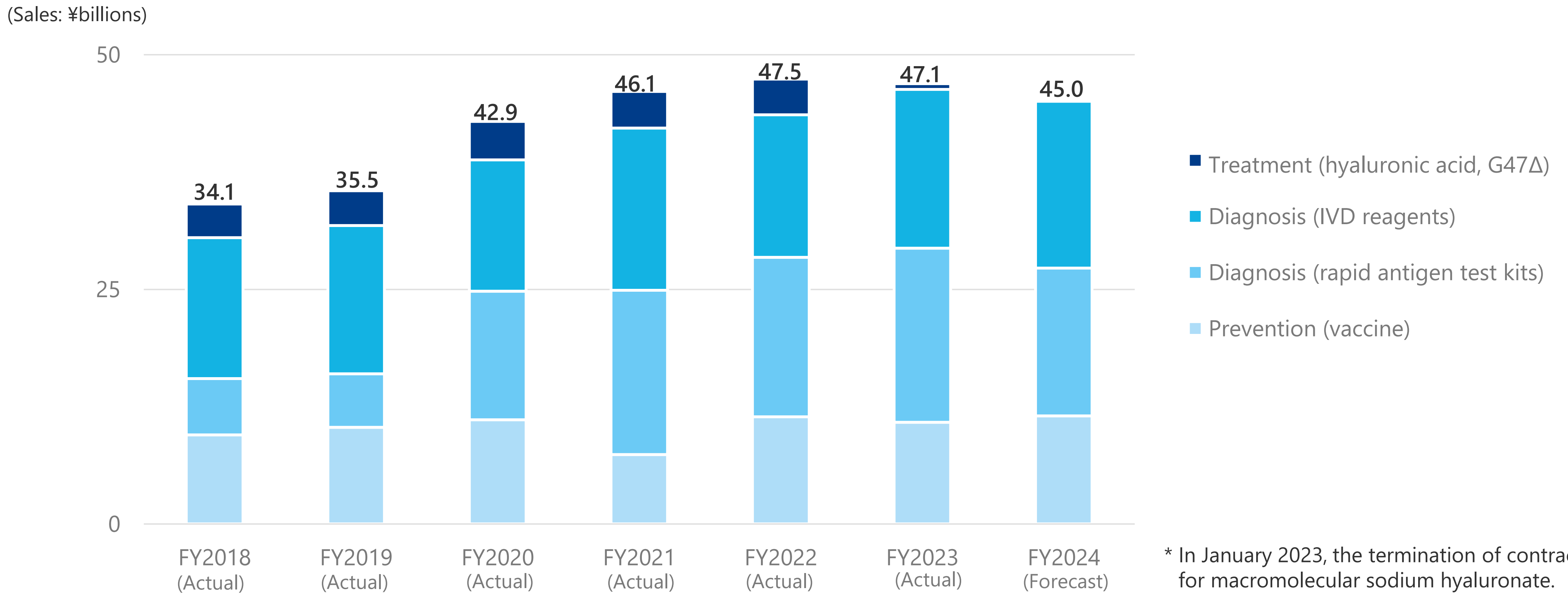
Cost and Other	↓	Inventory impact (impact of fixed cost per unit on beginning inventory balances) Increase in depreciation, labor costs, etc., due to establishment of increased production system

*TIM (Thermal Interface Materials)

Denka

■ **Demand for testing expanded due to changes in the environment for infectious diseases after COVID-19, driving growth in the diagnostic field (IVD reagents, rapid antigen test kits) in FY2024 and beyond**

Sales Composition by Application



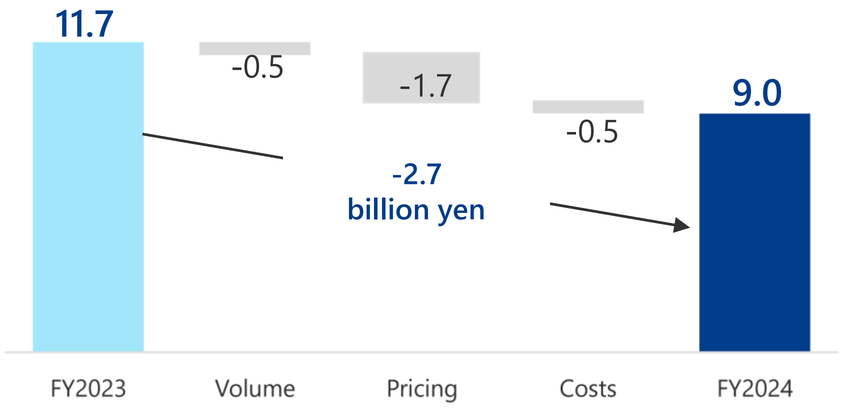
* In January 2023, the termination of contract manufacturing for macromolecular sodium hyaluronate.

Denka

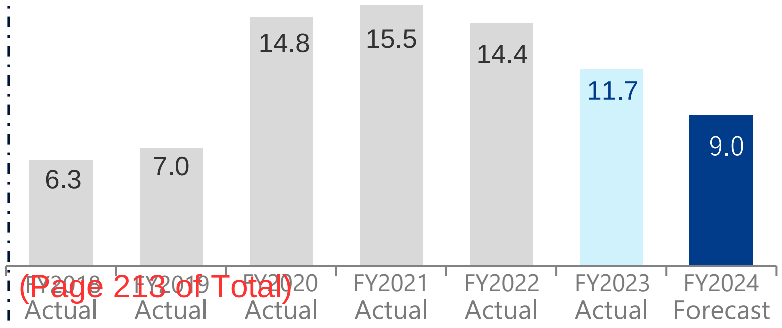
■ We forecast a decrease in profit due to lower profits from rapid antigen test kits (impact of lower sales prices and lower sales volume), higher research expenses, etc.

Operating Income Variance Analysis (Year on Year)

(¥ billions)



(Reference) Operating Income



Reason for Variance (Year on Year)

	Sales	Volume		Pricing	
Influenza Vaccine	↗	↗	・Productivity for manufactured strains expected to be on par with the previous year ・We expect sales to increase with early shipments (9 million vaccines produced)	→	
Rapid Antigen Test Kits	↘	↘	・We expect the normalization of influenza infections to result in fewer simultaneous test kits for COVID 19 and influenza (combo kits)	↘	・Factored in the risk of lower sales prices due to reductions in insurance points
IVD Reagents (inflammation markers, etc.)	→	↗	・We expect to see a broader base in the Chinese market and rising demand for testing as the market shifts from concentration among large hospitals to decentralization among smaller regional hospitals	↘	・Selling prices likely to fall in conjunction with the implementation of the centralized purchasing policy in China, a measure to counter rising medical costs

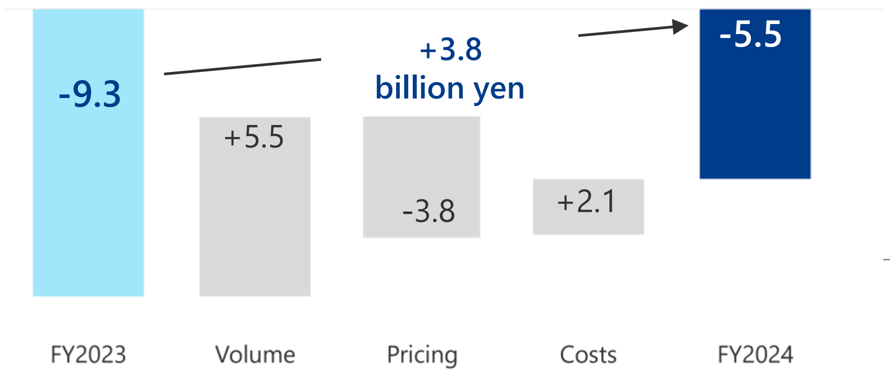
Cost and Other ↘ Increase in research expenses due to R&D for new businesses

Denka

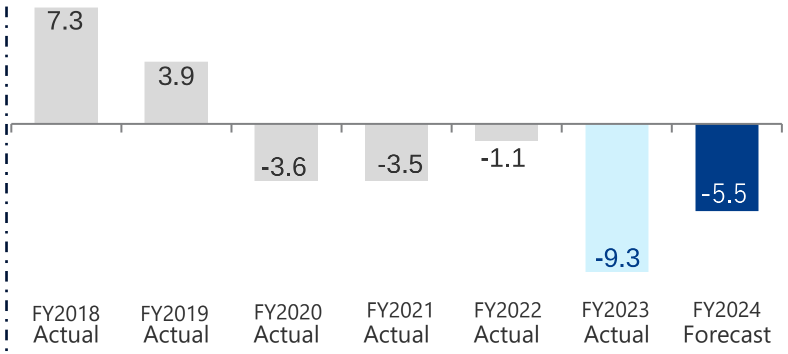
■ Despite lower sales prices, chloroprene rubber should see narrower losses with an increase in sales volume and a decrease in the amount of inventory write-downs; as a whole, segment loss should also narrow

Operating Income Variance Analysis (Year on Year)

(¥ billions)



(Reference) Operating Income



Reason for Variance (Year on Year)

	Sales	Volume		Pricing	
Chloroprene Rubber	↗	↑	・Higher YoY, as demand recovers	↓	・We expect sales prices to decrease significantly due to intensifying competition with the products of other companies
Special Cement Additives	→	→	Largely unchanged from last year	→	
Cement	→	→	Largely unchanged from last year	↗	・Price hikes in the previous fiscal year will contribute to an increase

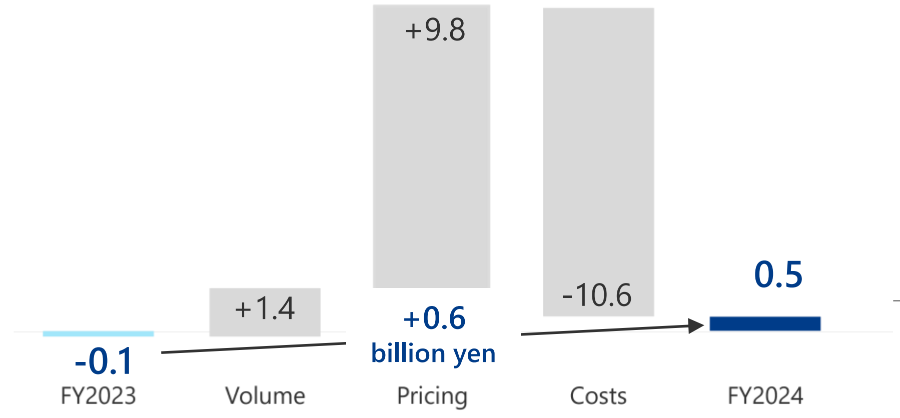
Cost and Other	↗	Decrease in write-downs of chloroprene rubber inventory* Coal prices fell (FY2023: $161/t ⇒ FY2024: $129/t)

Denka

■ Demand for PCs, home appliances, and other products should experience a moderate recovery, but we do not expect to reach FY2021 profit levels yet

Operating Income Variance Analysis (Year on Year)

(¥ billions)

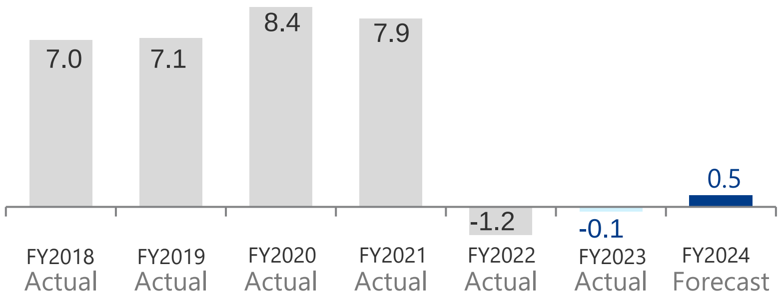


Reason for Variance (Year on Year)

	Sales	Volume		Pricing	
MS Resin	↗	↗	・Higher YoY, as demand for LGP applications for PCs recover	↗	
AS, ABS, Transparent Resins, Etc.	↗	↗	・Higher YoY, as we expect a recovery in demand for consumer electronics, cosmetics containers, general merchandise, etc.	↗	Styrene Related Product: Price revision in response to soaring raw materials and fuel prices
Food Wrapping Sheets and Containers	→	→	・Largely unchanged YoY, as demand will likely remain weak	↗	
Toyokalon	↗	↗	・Higher YoY, as demand in the African market likely to experience a moderate recovery	↗	

Cost and Other	↓	Variable costs: Higher raw materials and fuel prices (spread maintained) Fixed costs: Increase due to labor costs, etc.

(Reference) Operating Income



f) Investment, Depreciation, R&D by Segment

Denka

- **We will pursue further selectivity in investments, while we expect to make important strategic investments in FY2024, including a new manufacturing hub for acetylene black in Thailand and construction to increase production of IVD reagents and rapid antigen test kits**

(¥ billions)

	Investment				Depreciation				R&D			
	FY2023		FY2024		FY2023		FY2024		FY2023		FY2024	
	1H Actual	FY2023 Actual	1H Forecast	FY2024 Forecast	1H Actual	FY2023 Actual	1H Forecast	FY2024 Forecast	1H Actual	FY2023 Actual	1H Forecast	FY2024 Forecast
Electronics & Innovative Products	8.2	**23.2**	23.0	**48.0**	4.4	**8.8**	4.8	**9.6**	2.7	**5.3**	3.0	**6.0**
Life Innovation	1.4	**3.9**	2.0	**10.0**	1.9	**3.7**	1.5	**3.0**	2.3	**4.5**	3.0	**6.0**
Elastomers & Infrastructure Solutions	4.6	**11.8**	3.0	**8.0**	4.3	**8.9**	4.5	**9.0**	1.4	**2.8**	1.5	**2.5**
Polymer Solutions	2.3	**4.7**	2.0	**4.0**	2.5	**5.1**	2.5	**5.0**	1.2	**2.2**	1.0	**2.5**
Others	-	**0.2**	-	**-**	0.2	**0.4**	0.2	**0.4**	0.2	**0.5**	-	**-**
Total	16.5	**43.7**	30.0	**70.0**	13.4	**26.9**	13.5	**27.0**	7.8	**15.2**	8.5	**17.0**

Denka

- **We expect to maintain the same level as the previous year at 100 yen per share (96% total return ratio), after taking into account the impact of the drastic measures for the chloroprene rubber business to be announced in 2024, as well as expectations for cash flow improvement in FY2025 and beyond, and other factors**

		FY2018 Actual	FY2019 Actual	FY2020 Actual	FY2021 Actual	FY2022 Actual	FY2023 Actual	FY2024 Forecast
Net Income	(¥ billions)	25.0	22.7	22.8	26.0	12.8	11.9	9.0
Dividends per Share	(¥/share)	120.0	125.0	125.0	145.0	100.0	100.0	100.0 Mid-term 50.0 End 50.0
Dividend	(¥ billions)	10.5	10.8	10.8	12.5	8.6	8.6	8.6
Shareholders Return		42%	48%	47%	48%	68%	72%	96%
Stock Purchase	(¥ billions)	2.1	-	-	-	-	-	-
Total Return	(¥ billions)	12.6	10.8	10.8	12.5	8.6	8.6	8.6
Total Return Ratio		50%	48%	47%	48%	68%	72%	96%
Depreciation	(¥ billions)	22.9	22.5	22.9	23.9	27.0	26.9	27.0
Investment & Lending	(¥ billions)	32.8	36.9	42.3	35.6	39.4	43.7	70.0
Interest Bearing Debt	(¥ billions)	112.1	134.3	138.2	137.0	169.7	174.4	209.0
Net D/E Ratio		0.40	0.42	0.42	0.40	0.50	0.45	0.60
ROIC		7.8%	6.6%	6.8%	7.3%	6.7%	2.5%	3.0%
ROE		10.3%	9.1%	8.8%	9.4%	4.4%	4.0%	2.9%

Response to Changed Assumptions Under Mission 2030 Management Plan

Denka

■ **In response to changing assumptions related to our management plan, we intend to return performance to a growth trajectory beginning in the second half of FY2024, controlling financial status to a D/E ratio of between 0.6x and 0.8x**

Progress in Key Financial KPIs

	KPIs for FY2030	FY2021 Actual (record-high profit)	FY2023 Actual	FY2024 Forecast
Operating Income	100 billion yen or more	40.1 billion yen	13.4 billion yen	18.0 billion yen
Operating Margin	15% or higher	10.4%	3.4%	4.3%
ROE	15% or higher	9.4%	4.0%	2.9%
ROIC	10% or higher	7.3%	2.5%	3.0%
Approved Investment Amount	FY23 to FY30 (8 Yrs) 540 billion yen	35.6 billion yen	116.7 billion yen	42.0 billion yen

Environmental Changes Alter Management Plan Assumptions

(Result)
Upfront investments prevent us from achieving sales volume growth commensurate with increased costs

FY2023 Operating Income Variance Analysis (vs. FY2021)
・Volume difference: -10.0 billion yen
・Fixed cost difference: -15.0 billion yen

Response

Results: Return to growth trajectory beginning in the second half of FY2024

Financial: Target a D/E ratio of between 0.6x and 0.8x

- **We will return our performance to a growth trajectory in the second half of fiscal 2024 and control our D/E ratio to 0.6-0.8times by maintaining an aggressive shareholder return policy, carefully selected strategic investments, portfolio transformation and promotion of the best-practice project**

Positive Shareholder Return Policy

Total return ratio of 50% (cumulative eight-year total for plan)

Aiming to maintain or increase dividends per share, taking into account future cash flows, etc.

Revise Investment Plans

Careful Selection of Investment Projects
Aiming to reduce investment cash flow by 100 billion yen over eight years

Portfolio Transformation

Top priority: Drastic measures in the chloroprene rubber business (to be determined by the end of 2024)

Best Practice Project

Cost Reduction
10.0 billion yen or more per year by FY2026
Business Streamlining
Individual employee growth

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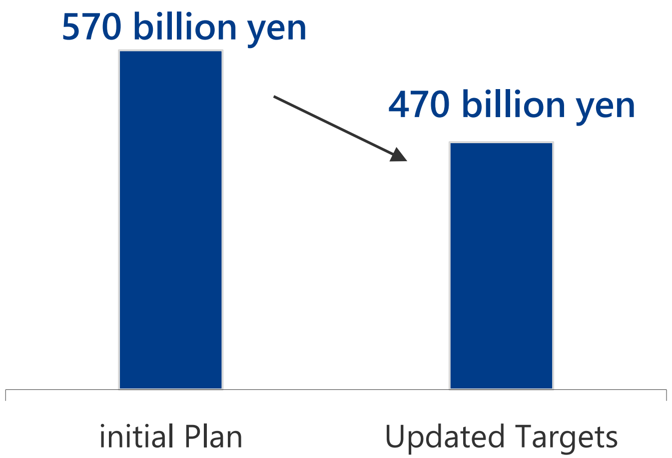
Revise Investment Plans

- **Concentrate management resources on carefully selected investment projects, aiming to reduce investment cash flow by 100 billion yen over eight years**

Mission 2030 Eight-Year Plan
(Investing CF)



・Clarify investment priorities and exercise even greater care in selecting investment plans

・Revise schedules for non-urgent projects

Carefully Selected Investment Projects

	FY2024	FY2025	FY2026-
ICT & Energy	Increase Spherical Fused Silica (launch in 1H)	Increase Silicon Nitride Powder (launch in 1H)	Acetylene black New manufacturing base in Thailand (launch in 2026 2H) Investment: 0.4 billion USD
	Relocate to New Facility for Thermally Conductive Sheets (launch in 1H) Investment: 1.7 billion yen	Operate LCP Film Facility	M to A investments Introduce in Omuta Plant (launch in 2026 1H) Investment: 6.7 billion yen
	Launch Manufacturing and Marketing of SNECTON (begin in 2H)	Operate TBM Facility	Planned investment in SNECTON
	Increase Emitters (launch in 2H) Investment: 1.0 billion yen		
Healthcare	Increase IVD Reagents and Antigen Test Kits (launch in 2H) Investment: 11.0 billion yen	Increase G47Δ pharmaceutical Investment: 12.0 billion yen (FY2025–FY2026-)	
Sustainable Living		Relocate to New Facility for TOYODRAIN Polyethylene Drainpipes (launch in 1H) Investment: 2.3 billion yen	M to A investments Deploy in Omi Plant
			Carbonation Admixture LEAF Planned investment

Details for each area provided on pages 33-35

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Portfolio Transformation

■ **Pursue business restructuring, including divestitures and withdrawals, to concentrate management resources on growth areas, improve business performance, and bolster finances**

Progress

・Plans to implement final measures over a defined period of time for six businesses

1-star and loss-making businesses discussed in FY2023; policies to be determined by the end of FY2024.
Six of these businesses to implement final measures over a defined period of time.

Six businesses: Total operating loss of -15.0 billion yen

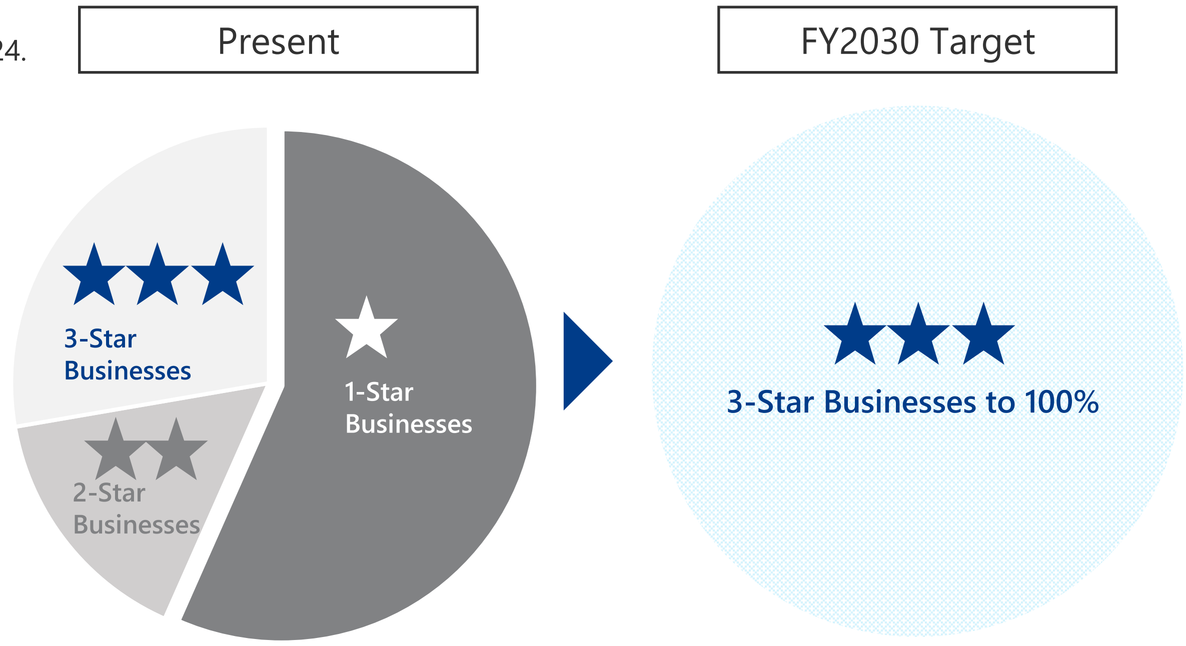
Highest Priority:
Drastic measures for the chloroprene rubber business (to be decided by the end of 2024)

(1) Examine demand trends for signs of recovery to the pre-COVID-19 level of 270,000 tons to 290,000 tons
(2) Examine optimal production capacity for chloroprene rubber for the Denka Group in the Omi Plant and DPE in the U.S. in light of perspectives including exchange rate trends, raw material market conditions, and BCP measures, based on the assumption of future demand trends

Accelerate considerations related to styrene related product business

Accelerate considerations of sales and production optimization for the styrene related product business, which is neither a 1-star nor a loss-making business, considering how to address the ongoing slump in polymer solutions and trends in industry restructuring

Unit: No. of businesses



See page 37 for the definition of a 3-star business

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Best Practice Project

- **In addition to achieving results of 5 billion yen per year by FY2025 and 10 billion yen per year by FY2026, we intend to improve the efficiency of human capital for operational efficiencies and the individual growth of each employee**

To Date

Cost reductions based on in-house knowledge

Best Practice Project

Make full use of external benchmarking and best practice

Zero-based review
- Conduct thorough review of needs, cost justifications

Global optimization
- Engage in consistent cross-departmental coordination and pursue overall optimization

Scientific approach
- Engage in rational cost management based on facts and data

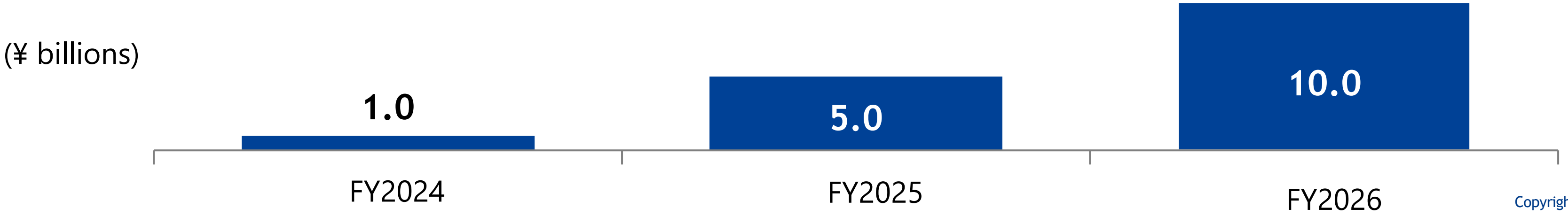
System
- President personally committed as overall leader
- Establish the Best Practice Promoting Department to act as a dedicated organization
- Appoint an owner with numerical accountability for each team

Governance
- Conduct rigorous progress management and timely visualization of results
- Use monthly policy-making meetings to receive top approvals for goals and measures

Engagement
- Involve all employees in detailed management-employee dialogues
- Share a portion of successful results with employees

Target

Pursue best practice to achieve not only numerical results, but also individual employee growth



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ICT & Energy (1)

Acetylene black New manufacturing base in Thailand (launch in 2026 2H) Investment: 0.4 billion USD	・Applications: LiBs for xEV, high voltage transmission line cables for offshore wind power generation ・In response to the rapidly growing demand for acetylene black, we established a joint venture with SCG Chemicals Public Company for the manufacturing and sale of acetylene black, and will construct a plant with an annual production capacity of 11,000 tons ・Operation launch: 2026 2H Investment amount: US$400 million Investment ratio: DENKA Group 60%, SCG 40% https://www.denka.co.jp/eng/storage/news/pdf/463/20231010_denka_abjv_en.pdf
Increase Silicon Nitride Powder (launch in 2025 1H)	・Applications: insulating substrates for xEV inverters in power modules, bearing balls for traction motors ・Reliable quality and cost-effective performance that meet requirements in the xEV (automotive) market: heat dissipation, light weight, high rigidity, and long useful life ・Expand further to meet the strong xEV market demand (Operation launch: FY2025)
Increase Spherical Fused Silica (launch in 2024 1H)	・Decision to Expand Spherical Fused Silica Manufacturing Facilities in Singapore -Increasing manufacturing capacity by approximately 30% for further growth in the environment and energy fields- https://www.denka.co.jp/eng/storage/news/pdf/470/20220511_denka_silica_en.pdf
Relocate to New Facility for Thermally Conductive Sheets (launched in 2024 1H) Investment: 1.7 billion yen	・Denka Introduces New Production Facility for Thermally Conductive Sheet for 5G/xEV to Shibukawa Plant and Doubles Production Capacity -Positioning as One of the Core Production Plants of Electronic Materials to Enhance Specialty Business- https://www.denka.co.jp/eng/storage/news/pdf/376/20211125_denka_shibukawa_en.pdf

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ICT & Energy (2)

Increase Emitters (launch in 2024 2H) Investment: 1.0 billion yen	･Applications: Surface observation application for semiconductor materials and devices (wafer inspection, mask inspection, etc.) and circuit patterning application in semiconductor manufacturing lithography processes, etc. ･Demand for emitters capable of emitting electronic wires only a few micrometers thick due to miniaturization and microminiaturization of semiconductors. Enhance to meet growing demand
SNECTON (Low Dielectric Macromonomer/LDM)	･Applications: Substrates for copper clad laminates (CCL) and interlayer dielectric materials ･We resolve issues faced by soft materials in heat resistance and dielectric properties. Evaluation is progressing steadily as a base material for rigid substrates for high speed communications and an interlayer dielectric material. As the only manufacturer of both resin materials and inorganic fillers, we are able to offer our own unique proposals by Varnish, a resin filler mixture.
LCP Film (Liquid Crystal Polymer Film)	･Applications: Substrates for flexible copper clad laminates (FCCL) ･LCP is a extremely difficult resin to make into film, and few manufacturers can provide a stable supply of LCP. By applying the film deposition technology for organic materials cultivated in the electronic packaging and food packaging sheet businesses, w e have established a technology for manufacturing LCP using the T-die method (T die extrusion method) , which offers superiority in mass production and film thickness control. LCP is expected to be a base material for flexible circuits of high speed communications.
TBM (Temporary Bonding Material for use in Semiconductor Manufacturing Processes)	･Applications: Temporary fixing heat-resistant adhesive used in back-grinding process to thin wafers in the semiconductor manufacturing process ･The most common method of protecting wafer circuit surfaces and fixing wafers to equipment is through temporary fixing with tape, such as our Elegrip, due to its cost and simplicity. However, using adhesives to temporarily fix wafers is common when processing difficult-to-grind wafers, such as ultra-thin films or hard and brittle wafers, to improve handling. In addition, the polished surfaces after back grinding are subjected to high temperature treatment in the manufacturing of next-generation semiconductors, such as power devices. As tapes cannot be used on these surfaces due to insufficient heat resistance, the market for heat-resistant adhesives is expected to expand.

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Healthcare

Increase G47Δ pharmaceutical
Investment: 12.0 billion yen

- G47Δ is the world's first approved oncolytic therapeutic virus for malignant glioma (brain tumors)
- We decided to increase G47Δ in preparation for a rapid increase in future demand, such as in overseas expansion and clinical research in other types of cancers
- Investment: Approximately 12 billion yen

https://www.denka.co.jp/eng/storage/news/pdf/456/20230412_denka_g47_en.pdf

Increase IVD Reagents and Antigen Test Kits
(launch in 2024 2H)
Investment: 11.0 billion yen

- Denka Announces Expansion of Reagent Production Capacity Including Antigen Test Kits through Strategic Investment of Approximately 11 Billion Yen -Strengthening Health Care Business and Commitment to Control Infectious Diseases Worldwide-

_https://www.denka.co.jp/eng/storage/news/pdf/409/20220414_denka_gosen_en.pdf

Sustainable Living

M to A
(Methane to Acetylene)
Investment
Introduce in Omuta Plant
(launch in 2026 1H)
Investment: 6.7 billion yen
⇒Deploy in Omi Plant

- To reduce CO_2 emissions, we introduced equipment to the Omuta plant for a new process to produce acetylene from methane developed by Transform Materials, a venture company in the U.S.
  We demonstrate this technology and conduct joint research on technological improvements toward large scale mass production of acetylene.
- We deploy M to A, which established mass production technology at Omuta plant, to the carbide chain at the Omi Plant, which has our unique hydroelectric power generation system. This enabled us to achieve low carbon chloroprene rubber and utilize hydrogen energy obtained as a byproduct of the manufacturing process.
- We expect to reduce 300,000 ton of CO_2 through the conversion of our current manufacturing method (the carbide method) and the utilization of hydrogen
- Operation launch: FY2026 1H

https://www.denka.co.jp/eng/storage/news/pdf/468/20230809_mtoa_en.pdf

Carbonation Admixture LEAF

- This is the key material for CO_2-SUICOM, the world's only carbon-negative concrete in used in practical application
- A consortium of 55 companies, led by Kajima Corporation, Takenaka Corporation, and our Company, made a joint proposal to the NEDO Green Innovation Fund Projects, aiming for the full-scale diffusion of LEAF. The proposal was adopted.
- The consortium developed CUCO, a precast component for construction, which was used as a foundational component in temporary buildings for the Expo 2025 Osaka, Kansai, Japan. This is the first time the component has been applied to an actual building since its use in civil engineering structures in FY2022.

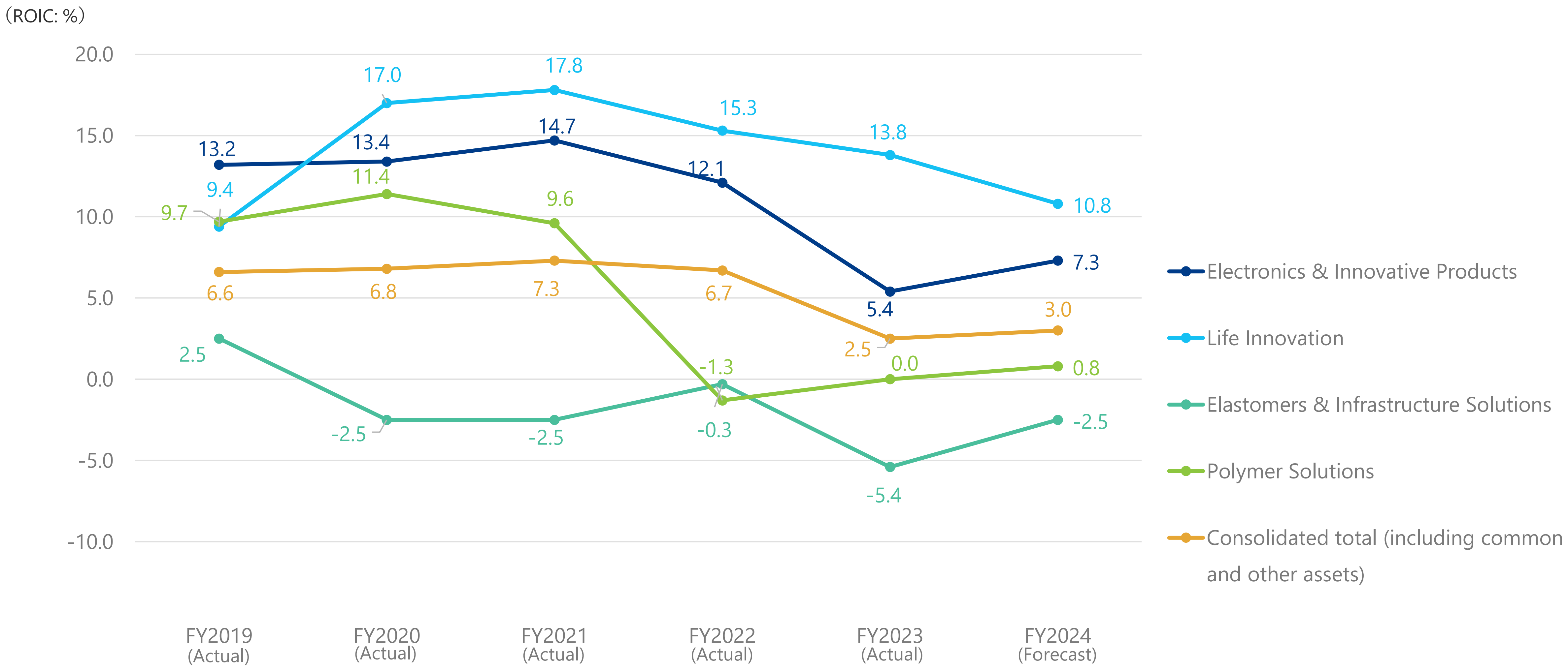
*Released by Takenaka Corporation https://www.takenaka.co.jp/news/2023/10/04/

Relocate to New Facility for TOYODRAIN Polyethylene Drainpipes
(launch in 2025 1H)
Investment: 2.3 billion yen

- Denka Increases Capacity to Produce TOYODRAIN Polyethylene Drainpipes Through Strategic Investment of Approximately 2.3 Billion Yen

https://www.denka.co.jp/eng/storage/news/pdf/432/20221011_toyodrain_en.pdf

Denka


(ROIC: %)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
13.2
13.4
14.7
12.1
5.4
7.3
9.4
17.0
17.8
15.3
13.8
10.8
2.5
-2.5
-2.5
-0.3
-5.4
-2.5
9.7
11.4
9.6
-1.3
0.0
0.8
6.6
6.8
7.3
6.7
2.5
3.0
FY2019 (Actual)
FY2020 (Actual)
FY2021 (Actual)
FY2022 (Actual)
FY2023 (Actual)
FY2024 (Forecast)
Electronics & Innovative Products
Life Innovation
Elastomers & Infrastructure Solutions
Polymer Solutions
Consolidated total (including common and other assets)

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Three Elements	Definition	Objective
Specialty	**ROIC by Product >10%** **(Past Three-Year Avg.)**	To emphasize capital efficiency, in addition to profits resulting from market share, uniqueness, and technological capabilities (number of patents)
Megatrend	**Three Applicable Focus Areas** **(ICT＆Energy, Healthcare, and Sustainable Living)**	Businesses judged to have growth potential if said business corresponds to the three focus areas derived from identified megatrends
Sustainability	**Less Than 10,000 Tons of CO_2 Emissions by Product** **and** **Labor Productivity by Product (Op. Inc./Person) ＞ 5 million Yen**	CO_2 emissions must be included, as emissions represent clear KPIs toward a 60% reduction in 2030 and carbon neutrality in 2050 In addition, businesses having low labor productivity will find it difficult to continue operations due to the future decline in the working population

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2030 KPI Targets

Financial

KPI	Target	KPI	Target
Operating income	100 billion yen or more	Operating margin	15% or higher
ROE	15% or higher	ROIC	10% or higher
Approved investment amount	540 billion yen (8 years from FY2023 to FY2030)	Total return ratio	50% level

Non-Financial

KPI	Target	KPI	Target
CO_2 emissions	60% reduction compared with FY2013 (1 million tons)	Maximum output of renewable energy power	150MW
Rate of lost-worktime injuries: (Number of deaths and injuries ÷ Total hours worked × 1 million)	0.2 or less	Managerial positions occupied by women, foreign nationals, and experienced hires	50%

(Reference) Detail of Megatrends Incorporated in the *Mission 2030* Management Plan

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Business Segments and *Mission 2030* Megatrends (Breakdown of Operating Income Targets)

(¥ billions)

Segment	FY2026	FY2030
Electronics & Innovative Products	30	45
Life Innovation	20	40
Elastomers & Infrastructure Solutions	3	5
Polymer Solutions	7	10
Total	60	100

Management Plan: Three Megatrend Areas	FY2026	FY2030
ICT & Energy	30	45
Healthcare	20	40
Sustainable Living	10	15
Total	60	100

Electronics & Innovative Products → ICT & Energy; Life Innovation → Healthcare; Elastomers & Infrastructure Solutions and Polymer Solutions → Sustainable Living

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Sales (¥ billions)	FY2022 1Q	FY2022 2Q	FY2022 3Q	FY2022 4Q	FY2023 1Q	FY2023 2Q	FY2023 3Q	FY2023 4Q	FY2024 Forecast 1H	FY2024 Forecast 2H
Electronics & Innovative Products	21.9	25.6	22.3	23.8	19.2	22.5	21.7	24.5	45.0	55.0
Life Innovation	6.4	15.5	16.9	8.8	7.2	15.0	15.8	9.0	20.0	25.0
Elastomers & Infrastructure Solutions	30.4	32.5	31.6	29.3	28.0	29.2	28.6	25.6	60.0	60.0
Polymer Solutions	31.6	32.0	30.3	33.7	29.8	31.7	30.9	31.9	65.0	70.0
Others	4.1	2.9	4.7	3.4	3.7	5.1	4.5	5.4	10.0	10.0
Total	94.4	108.6	105.8	98.8	87.8	103.5	101.5	96.4	200.0	220.0

Operating Income (¥ billions)	FY2022 1Q	FY2022 2Q	FY2022 3Q	FY2022 4Q	FY2023 1Q	FY2023 2Q	FY2023 3Q	FY2023 4Q	FY2024 Forecast 1H	FY2024 Forecast 2H
Electronics & Innovative Products	4.1	5.6	4.1	4.2	2.1	2.8	1.8	2.4	5.0	7.0
Life Innovation	0.5	6.0	5.0	2.8	0.9	5.7	3.1	2.0	4.0	5.0
Elastomers & Infrastructure Solutions	-0.2	1.5	-1.3	-1.1	-0.7	-0.9	-3.9	-3.7	-1.5	-4.0
Polymer Solutions	-0.1	-0.0	-0.9	-0.1	-0.0	-0.2	0.6	-0.4	0.0	0.5
Others	0.6	0.4	0.9	0.4	0.5	0.5	0.4	0.6	1.0	1.0
Total	4.9	13.4	7.8	6.3	2.8	7.7	2.0	0.8	8.5	9.5

Cautionary statement regarding forward-looking information

Target figures in this material are not forecasts of business results.
In addition, any description relating to the future in this material is subject to known or unknown risks and uncertainties, although it is based on management's current assumptions and beliefs in light of the information currently available to it.
Please be cautioned that a number of important factors could cause actual results to differ significantly from the description in the material.
Such risks and uncertainties include adverse economic conditions, currency exchange rate fluctuations, adverse legislative and regulatory developments, delays in new product launch, pricing, and product initiatives of competitors, the inability of the Company to market existing and new products effectively, interruptions in production, infringements of the company's intellectual property rights and the adverse outcome of material litigation.

Possibility of chemistry

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Inquiries regarding this material

**Corporate Communications Dept,
Denka Co., Ltd.**

TEL	03-5290-5511
URL	https://www.denka.co.jp/eng/

EXHIBIT E

Denka, *FY2023 Financial Results Presentation Summary of Q&A Session* (May 10, 2024)

FY2023 Financial Results Presentation
Summary of Q&A Session
(May 10, 2024)

Electronics & Innovative Products

Q1 : Profit improved from the third quarter through the fourth quarter. Could you describe the status of recovery in demand you have seen thus far for spherical fused silica and spherical alumina, both of which are Denka's mainstay products?

A1 : Having bottomed out, demand for spherical fused silica, which is used as semiconductor encapsulant fillers, is already on a recovery track. We expect this demand to fully recover from the second half of fiscal 2024 onward. Spherical alumina is used mainly as a thermal interface material for xEV-related products, semiconductors and electronic components, but it is also used as a semiconductor encapsulant filler. Boasting higher thermal conductivity than spherical fused silica, spherical alumina is increasingly being sought out for applications involving high-voltage electrical current, such as those for generative AI.

Q2 : In Europe and the United States, demand for xEV-related products looks like it will be weak in 2024. Please share your forecast on demand for acetylene black.

A2 : Growth in EV sales has been decelerating in Europe and the United States, and sales in these regions account for a large proportion of Denka's overall sales of acetylene black for use in xEV-related products. Also, we have seen the expansion of xEV markets tapering off in some regions. Nevertheless, we believe that the overarching trend toward expansion will persist in EV markets. Therefore, we expect demand for acetylene black to recover in the second half of 2024 or later.

Q3 : Please share your expectations for SNECTON and TBM, both of which are set to be released in fiscal 2024.

A3 : SNECTON is already in the process of certification by major substrate manufacturers, including those based in Taiwan. Accordingly, we expect that this product will contribute to profit in fiscal 2025. As for TBM, it has been shown to be particularly beneficial when used as an SiC semiconductor material. Moreover, TBM demonstrates robust functions when used in advanced semiconductor packages. We therefore expect this product to be adopted by a growing number of manufacturers.

Life Innovation

Q4 : With regard to rapid antigen test kits, combo kits capable of simultaneously testing for COVID-19 and influenza are considered to become the mainstream of sales going forward. However, fiscal 2024 sales forecasts for the combo kits fall short of sales recorded in fiscal 2023. Why is that?

A4 : The first half of fiscal 2023 saw a rapid and widespread rise in influenza virus infection. Reflecting the unusual circumstances, the sales volume of combo kits constituted a majority of rapid antigen test kit sales volumes throughout the fiscal year. On the other hand, for fiscal 2024 we anticipate a return to normal in the annual pattern of influenza infection. Based on a projection that the spread of influenza virus will begin in the second half, we thus expect that COVID-19 antigen test kits will account for the majority of these sales volumes in the first half, and the combo kits will account for the majority in the second half. Taking these factors into account, we forecast that the sales volume of combo kits will fall short of the sales volume in the previous fiscal year.

Elastomers & Infrastructure Solutions

Q5 : In fiscal 2024, global demand for chloroprene rubber (CR) is expected to recover from the stagnation seen in fiscal 2023 and amount to 230,000 tons. Please provide your forecast on fiscal 2024 profit and loss associated with CR.

A5 : In fiscal 2023, our CR business recorded valuation losses on inventories, reflecting higher fixed costs per product. This was attributable to higher costs recorded by the U.S.-based DPE* and lower facility utilization rates due to fallout from the Noto Peninsula Earthquake and stagnant global demand. For fiscal 2024, we expect CR sales prices to decline due to the intensification of competition with products manufactured by other companies. However, we also anticipate recovery in demand and resulting reductions in valuation losses on inventories. Accordingly, the volume of CR-related losses is likely to decrease.

* Denka Performance Elastomer LLC, a U.S. chloroprene rubber manufacturing subsidiary

Portfolio Shift

Q6 : The U.S. Environmental Protection Agency announced new regulations on April 9, 2024 (local time). Will this move affect Denka's decisions regarding drastic portfolio-shift measures for the chloroprene rubber business?

A6 : It is undeniable that these regulations are extremely stringent. However, the Denka Group will make decisions on measures for its CR business based on a close assessment of future demand for this product and a determination of the optimal production capacity it needs to maintain. These measures will thus be decided in light of the possibilities for this business. This is our basic stance.

Q7 : As part of the portfolio shift, Denka has said it is considering the optimization of sales and production systems for its styrene-related operations. Could you please elaborate on these topics?

A7 : Denka's styrene monomer plant, which supports the upstream of the styrene chain, is based in the Kanto area, the domestic region where demand is highest. We believe that this plant is competitive thanks to this placement. Moreover, it is our only styrene monomer plant. In addition, downsizing this plant would not be an easy task as it is our only styrene monomer plant. On the other hand, we run multiple manufacturing lines for downstream products. Although we have several options in mind, we intend to determine the optimal direction to be taken for these operations even as we pay close attention to developments regarding the reorganization of naphtha crackers in the Keiyo area.

Cash Flows

Q8 : The projected dividend payout ratio for fiscal 2024 amounts to 96%. While it's already high enough, the dividend payout ratio could surpass 100% due to, for example, the possible recording of impairment losses in connection with the drastic portfolio-shift measures for the chloroprene rubber business. Even if this scenario comes into play, will Denka maintain the volume of dividends, provided that the recording of said losses involve no cash outflows?

A8 : We have formulated the dividend forecast of ¥100 per share after taking into account the financial impact of the drastic portfolio-shift measures for the chloroprene rubber business. Our forecast also factors in expected cash flow improvement from fiscal 2025 onward. For fiscal 2024, we will therefore maintain dividends per share at this volume unless an unexpected incident emerges and affects our operating results to an extent that significantly exceeds our assumptions.

EXHIBIT F

Declaration of Letitia Taylor

DECLARATION OF LETITIA TAYLOR

1. My name is Letitia Taylor. I am 60 years old. I was born and raised in Reserve, St. John the Baptist Parish, Louisiana. Since 1994, I have lived in neighboring LaPlace, also in St. John the Baptist Parish. My current home is about one mile from Denka Performance Elastomer's neoprene plant. The plant emits a dangerous chemical, chloroprene, into the air we breathe.

2. My father founded Concerned Citizens of St. John in 2016, and I joined the organization the next year. I got involved to help advocate for clean air and to protect the next generation. I am now the program manager. One of the things that I do in this role is to update and share information about plant emissions. I am also a member of Environmental Defense Fund.

3. In about 1969, the plant started producing neoprene and emitting a dangerous chemical, chloroprene, just a few blocks away from my family's home in Reserve. Many of my other relatives also lived close to the plant.

4. Eventually, it seemed that nearly everybody in town started getting sick. The community started suspecting that there was something unusual and unnatural going on.

5. For example, in the early 1980s, my grandmother, who lived by the plant, was diagnosed with bone cancer, which she died from years later. My uncle,

cousin, and multiple neighbors, all of whom lived by the plant, also died of cancer.

6. I have two children, and one grandchild. They were all born in Reserve. My grandchild was born very prematurely, with respiratory issues. He has developmental delays and now, at age 2, is not speaking.

7. My family and community have seen other widespread health problems. My mother suffered from breast cancer, multiple sclerosis, and a rare blood disease. My sister was diagnosed with an extremely rare autoimmune disease, for which she takes infusions every week. My brother has kidney disease, and a year after he moved back to Reserve from living 20 years in California, he had a heart attack, followed by a second heart attack the next year, and was also diagnosed with diabetes (which we do not have a family history of).

8. I have observed a large number of ailments in my family and community. Many members of my family have eczema, asthma, sinus infections and other respiratory problems. Many members of my community suffer from ADHD and migraines.

9. I understand the cause of such a high rate of health problems to be our community's exposure to the emissions from the plant.

10. During the early months of the Covid crisis, St. John the Baptist Parish had the highest death rate per capita from Covid in the nation. Studies show that toxic air pollution can worsen the effects of Covid. I believe that we had such extremely high death rates because our residents' immune systems were compromised by the pollution.

11. My father's home in Reserve, about half a mile from Denka, has been a place of refuge and restoration for generations of my family. But the plant makes it much harder to feel that way because the air isn't safe to breathe.

12. The flares from the plant are frequent, especially at night. They light up the sky. Some weeks, the flares may go on for three days. We do not know what is happening when we see this. The company never warns or informs us about the flares.

13. I vividly recall an explosion at the plant when I was younger. My family heard a huge boom, and we thought at first that a plane had crashed. We had a hard time fleeing because we lived on a dead-end street, and we and the other people fleeing were stuck in traffic that stretched all the way to Baton Rouge.

14. I love to flower garden in my yard, and I try to garden outside a few hours in the evening every other day. However, while I am gardening, I am always aware of the Denka plant and the fact that I'm breathing its chemical

emissions. Because of the emissions, I go out less to garden, and when I do go out, I spend less time outside.

15. I'm sure our property prices have been impacted by the plant, especially as the problems it causes are now known nationwide. But I don't want anyone to move here and get sick.

16. For years, our community could rely only on our own observations of how the plant affected us. But in 2016, we began to learn a lot more information, when EPA came here and told us about the plant's emissions. We learned that St. John the Baptist Parish had the highest risk of cancer from toxic air pollution in the country.

17. It was very difficult to learn that everything my father and I talked about when we were younger – that it had to be the plant that was causing harm to our community – was true.

18. Our bodies have been exposed to over 50 years of toxins from the plant that have not been appropriately regulated. For many years, this pollution has attacked my community at every level – physically and emotionally. We have lost our homes. We have lost our loved ones. It is a terrible feeling, to watch our people die and feel that there is nothing we can do about it. And while we grieve those who have died, we also dread test results that may tell us we ourselves have been diagnosed with something new. It can feel very

helpless and hopeless, particularly as we think about the next generation and the harms they may endure.

19. I have been diagnosed with clinical depression, and in recent years my medication has been increased significantly. I believe that Denka's effects on my home, life, and community have contributed to my depression.

20. Though we felt for a long time that we had no control over this situation, in fact, this is something that could be stopped. It was an overwhelmingly good feeling to see EPA's regulation with emission limits for chloroprene and ethylene oxide go into effect. In St. John, we're exposed to both of those chemicals. The regulation is a breath of clean air, and is also our only hope, because Denka has not and will not act to protect us.

21. I understand that Denka is now trying to weaken the rule and wants to delay how quickly it needs to comply with the rule. If Denka succeeds and EPA weakens the rule or doesn't require Denka to comply with it soon, my family and community and I would have to breathe more toxic emissions. If Denka is given a full two years before it needs to comply with the rule, I would worry tremendously about my health and my family's health. We need EPA's rule to go into effect and for Denka to comply as soon as possible. That's why I support Concerned Citizens of St. John and the Environmental Defense Fund intervening in this lawsuit to protect the rule.

I declare under penalty of perjury that the foregoing is true and correct.

Dated: June 9, 2024

Letitia Taylor

EXHIBIT G

Declaration of Robert Taylor

DECLARATION OF ROBERT TAYLOR

1. My name is Robert Taylor, and I am 83 years old. I was born in and have lived my whole life in Reserve, Louisiana.

2. I was an air conditioner contractor and have retired.

3. I built my current home in Reserve in 1968 and lived here until Hurricane Ida destroyed the roof of my home. I currently live with my daughter in LaPlace, Louisiana, about a ten-minute drive away.

4. I had 4 children with my wife, 15 grandchildren, and 10 great-grandchildren. They were all were born and raised in St. John the Baptist Parish. Most of them still live in this Parish.

5. My house in Reserve is about half of a mile from Denka, a neoprene production facility that emits chloroprene into the air. I can see the plant from my balcony. My daughter's house in LaPlace is about one mile away from Denka.

6. I am the founder and Executive Director of Concerned Citizens of St. John. I founded the group in 2016, when EPA visited St. John and informed the community that Denka's chloroprene emissions were causing an extremely high cancer risk. EPA told us that census tract 708 in St. John had a cancer risk from toxic air pollution of over 1,500-in-one million, the highest in the country. This was the first time I was made aware of how these air emissions

were impacting us. I was shocked, so much so that I created Concerned Citizens of St. John.

7. As the executive director, I engage with EPA and state and local government to advocate for improving air quality. We fight for clean air so that we can survive.

8. Denka was previously owned by Dupont. Dupont started operating its neoprene facility in St. John in about 1969. The facility was built on a former plantation. When the plant was being built, the white residents left and moved north of Airline Highway because they had been warned about the pollution. I mistook that phenomenon for the white flight that was happening all over the country as a result of desegregation laws. By the time the plant started operating, almost everyone living in Reserve was Black.

9. In the 1970s and 1980s, I started realizing that something was wrong. Something unnatural was going on. After Dupont moved in, kids started saying they couldn't play outside because there was a bad odor and they had trouble breathing. Certain vegetation started dying. Eventually, people in my community started getting sick and dying. I've watched my whole family and community suffer from the same health issues: cancer, respiratory issues, and autoimmune disease.

10. My family has suffered and died from many health issues as a result of

inhaling toxic air. My mother died of bone cancer. She was the first person in her family to be diagnosed with cancer. My uncle and two of my cousins died from cancer. My brother died of lung cancer. Multiple of my neighbors, including my next-door neighbors on both sides of my home, have died of cancer.

11. My wife had breast cancer and has multiple sclerosis and a rare blood disease. She also has kidney and heart problems.

12. We moved my wife and one of my daughters out of the community because of how toxic emissions were hurting their health. The air pollution is so bad in St. John that it has separated me from my family.

13. My other daughter, who was born and raised in Reserve, has a very rare autoimmune disease that she needs infusions for every week. She was diagnosed while receiving specialized treatment for gastroparesis.

14. My son has kidney disease and lived for many years in California. He moved back to Reserve eventually, and a year after he moved back home, he had a heart attack, followed by another one the next year. He was diagnosed with type 2 diabetes, and we have no family history of it.

15. When my kids or grandkids have come inside from playing outside, they have complained of their noses burning and chests hurting. Many of my grandchildren have asthma, upper respiratory issues, and eczema. My great

grandson was born two years ago very prematurely. He is showing signs of respiratory issues and developmental delay.

16. The toxic chemicals we breathe every day compromise our immune systems. St. John the Baptist Parish suffered the highest per capita death rate from COVID-19 in the beginning of the pandemic because of how much toxic air pollution compromises our immune systems.

17. Since the neoprene plant moved in, I have also noticed that the natural vegetation and even some animals have changed dramatically. Trees are dying. The tops of trees are dead. Many plants that grew fruits and vegetables are now dead. Some insects my children and I grew up with—fireflies, locusts—are gone.

18. Living near Denka has also changed my daily routines and how I spend time outside. I used to like to take walks and sit outside and watch nature. I grew up walking a lot. But eventually I started noticing that the pollution was getting worse. There's no place I can walk in my community that's safe from Denka's emissions because we're right on the fenceline. So I stopped taking walks in my community. The only way to get away from these emissions is to drive out of the community to take a walk somewhere else.

19. I can't avoid Denka's emissions because no matter where I drive, I have to drive past the plant. Even if my car windows are closed, the outside air

comes in through the air conditioning system.

20. I am not safe from these emissions even in my own home, even when I shut the doors and close the windows, because the air comes in through the vents.

21. We're exposed to various toxins from Denka and other facilities, and many of these pollutants cause significant odors. The odor is often worse in the late night or early evening. The odors are also worse right before it's going to rain and when it rains. Sometimes, the odor from the air pollution has been so strong that I've had to go inside. But going inside doesn't fully protect us because we still have to rely on the air coming into our house or car. Sometimes, these odors have been so bad at night that, even when I've been inside my house asleep, they've woken me up.

22. I've seen huge flares come from Denka and heard emergency sirens. When I've asked local government if there is an evacuation plan for the community in case of an emergency at Denka, I've been told that there is no plan. Eventually, I was told to shelter in place if there's a disaster at the plant. But sheltering in place won't protect us because the emissions come into our homes. We need oxygen to breathe.

23. No words can fully describe the emotional and psychological pain this relentless pollution has caused me. Seeing my family and community, especially the young kids, get sick and die is so painful, especially because

this is all preventable. This is all unconscionable. It is difficult for me to really describe what I'm going through. This plant is a part of my daily life.

24. When I pass Fifth Ward Elementary School located right next to Denka, it's hard for me to look at those kids playing in the playground. I know being inside the school building isn't enough protection either. They spend hours a day at this school. And a significant number of those school kids go back home just a block away. They never leave the pollution. They live in census tract 708, so they're constantly bombarded with pollution. The kids who are bussed in to school might be fortunate enough to live somewhere where they're exposed to a lower level of chloroprene, but there's nowhere in St. John that is safe from chloroprene. A study showed that there was no location in St. John subject to lower than 0.2 micrograms of chloroprene per cubic meter, which is the level of chloroprene that EPA says causes an unsafe risk of cancer.

25. I have been fighting to reduce chloroprene emissions and for clean air for 8 years.

26. I am heartbroken that, after all these years and all this work, children are still being bussed into that hellhole. We have marched from Fifth Ward Elementary School to Baton Rouge. We've picketed at the school board. The science shows that children are more vulnerable to chloroprene than adults.

How many of these children are we sending to an early death? That's been traumatic for me.

27. Denka has caused significant economic problems for St. John's residents by drastically hurting our property values. I hired a state-licensed appraiser to apprise my property. He told me that my home's proximity to Denka nearly halved the value of my home.

28. These companies, worth billions of dollars, talk about giving us jobs, but most of Denka's employees are not from St. John. And even if Denka employees include some St. John residents, it is in exchange for harming the over 40,000 people who live here, including thousands of young people. How many jobs are worth the life of one child? Whose life should be sacrificed for someone to have a job? Or to make billions of dollars?

29. I don't want to sell my home because my conscience wouldn't let me sell this death trap to another family. I couldn't in good conscience see another family move into this area knowing that I played a part in allowing them to come here, get sick, and die.

30. We've waited for years for this rule requiring Denka and other facilities to reduce emissions. I understand that Denka is now suing EPA to try to weaken the rule and to challenge the 90-day deadline to comply. It is not acceptable for Denka to not be required to comply with this rule until a full

two years from now. If Denka succeeds and EPA weakens the rule and delays the deadline to comply, I will be extremely worried about my own health, my family's health, and the health of my community, especially our children who go to school right next to Denka. I support Concerned Citizens of St. John intervening in this lawsuit to defend the rule because we need this rule to protect the air we breathe and to survive.

I declare under penalty of perjury that the foregoing is true and correct.

Dated: June 9, 2024

Robert Taylor