



Comments of **DEFEND OUR HEALTH**

on the **2023 Draft Supplement to the 1,4-Dioxane Risk Evaluation**

prepared by the U.S. Environmental Protection Agency (EPA)

pursuant to the requirements of the revised Toxic Substances Control Act (TSCA)

September 8, 2023

**Summary.** Defend Our Health strongly supports the Environmental Protection Agency (EPA) finding that 1,4-dioxane poses an unreasonable risk to the health of workers and of community members exposed from drinking water sources. EPA has properly corrected its failure to consider drinking water and air pathways in its previous risk evaluation for 1,4-dioxane.

Despite these improvements to the 2020 risk assessment, the current draft risk assessment still fails to fully meet the goals and requirements of environmental justice and chemical policies. Thus, the current risk evaluation falls short of establishing the basis for fully protecting at-risk communities.

The polyethylene terephthalate (PET) plastics industry is the largest air emitter of 1,4-dioxane in the United States of any industry. Yet EPA has erred in finding that ambient air exposure to 1,4-dioxane from PET plastic manufacturing does not pose an unreasonable risk to fenceline communities. Air emissions from facilities that produce PET contribute to adverse health outcomes in fenceline communities, which are disproportionately communities of color.

As a result of this draft conclusion, EPA falls short of upholding the environmental justice principles outlined in President Biden's executive order from earlier this year, in which he called

for the meaningful engagement and consideration of the impacts of environmental injustice on communities of color.<sup>1</sup>

The EPA also ignores the requirements of the revised Toxic Substances Control Act (TSCA) by underestimating risks to fence-line communities and other potentially exposed and susceptible subpopulations from aggregate exposure to 1,4-dioxane from multiple conditions of use (COUs) and multiple exposure pathways.<sup>2</sup>

EPA improperly defined a lifetime exposure as 33 years for fence-line communities. The current assumptions around lifetime exposure do not reflect the reality of how people are actually exposed to 1,4-dioxane in the air that they breathe.

EPA must strengthen this draft risk evaluation to establish a more accurate baseline for protecting the health of fence-line communities as required by TSCA and Biden Administration environmental justice policies.

**Introduction.** Defend Our Health, a public health and social justice organization, works to create a world where all people are thriving, with equal access to safe food and drinking water, healthy homes, and products that are toxic-free and climate-friendly. We have nearly 20,000 supporters across the United States. The staff of Defend Our Health work in eight states with a headquarters office located in Portland, Maine.

In 2016, the Frank R. Lautenberg Chemical Safety for the 21st Century Act amended Title I of TSCA and directed the EPA to select chemicals to prioritize for a risk evaluation, the purpose of which was to determine whether or not a chemical posed an “unreasonable risk” to human health throughout the course of its lifecycle. Under TSCA, if a chemical poses an unreasonable risk, the EPA must regulate the chemical “to the extent necessary so that the chemical substance no longer presents such risk.”<sup>3</sup> In December 2020, the EPA finalized its risk evaluation for 1,4-dioxane, which found unreasonable risk to workers from 13 Conditions of Use (COUs). However, this initial risk evaluation did not evaluate exposure to 1,4-dioxane in drinking water and air. In July 2021, the Biden Administration announced plans to consider additional pathways of exposure in a supplemental risk evaluation, which was released in July 2023.

As President Biden stated in Executive Order 14096 earlier this year, “[o]ur Nation must also take ... steps to dismantle racial discrimination and institutional bias that disproportionately affect the health, environment, safety, and resiliency of communities with environmental justice concerns.” The EPA **must** answer this call. They must commit to regulating the most significant

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<sup>1</sup> Executive Order 14096 (88 FR 25251, April 26, 2023)

<sup>2</sup> 15 U.S.C. 2602(12)

<sup>3</sup> 15 U.S.C. § 2605

contributors to 1,4-dioxane discharges and releases, including the PET resin industry, whose facilities are disproportionately located in low income communities and communities of color.

- 1. EPA properly found that 1,4-dioxane releases from the production of PET plastic and related chemicals pose an unreasonable risk to exposed workers and community residents who rely on downstream drinking water sources.**

The EPA has produced a risk evaluation that significantly improves upon the shortcomings of the 2020 assessment. We applaud the agency for examining the additional conditions of use and pathways of exposure that result in exposure of fenceline community residents to 1,4-dioxane. We also applaud the agency for including additional COUs that were absent from the 2020 assessment, including 1,4-dioxane as an industrial byproduct.

EPA has also taken positive steps toward evaluating aggregate exposure by evaluating the impacts of fenceline communities exposed to multiple facilities that are located in close proximity to one another.

This additional analysis has yielded a more robust assessment that more accurately reflects the risks borne by those exposed to 1,4-dioxane. This is an important and crucial step forward in protecting the health and safety of fenceline communities.

***Recommendation:** EPA must stand firm on its conclusion that 1,4-dioxane poses an unreasonable risk to industrial workers and to community members exposed through drinking water sources, with no backsliding in the final risk evaluation.*

- 2. The EPA must also find that releases of 1,4-dioxane to the air pose an unreasonable risk to fenceline community members, and has erred in not doing so in this draft.**

There is an inconsistency between the assessed risk to fenceline communities and the EPA's assessment that ambient air emissions do not contribute to an unreasonable risk for 1,4-dioxane. The assessment clearly states that "[t]he COUs with estimated risks exceeding  $1 \times 10^{-6}$  include manufacturing, processing as an ethoxylation byproduct, processing as a byproduct of polyethylene terephthalate production,"<sup>4</sup> EPA calculated fenceline cancer risks that far exceed 1-in-1,000,000 (including from PET plastic manufacturing) but has still proposed a determination that air releases of 1,4-dioxane do not contribute to unreasonable risk. By making this determination, EPA is abandoning its 1-in-1,000,000 benchmark for general population and fenceline community cancer risks and is instead using a benchmark of 1-in-10,000 to 1-in-1,000,000 risk as a guidepost for "unreasonable risk". EPA has significantly weakened its cancer risk benchmark by a factor of 10- to 100-fold without justification.

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<sup>4</sup> Pg 19, EPA. (2023). 1,4-Dioxane Draft Revised Unreasonable Risk Determination.

This is a troubling conclusion, because it is not supported by past practice or a thorough analysis of the conditions. According to the EPA's own data, ambient air emissions contribute to increased cancer risks in fenceline communities at a rate that should warrant finding that it poses an unreasonable risk. Despite the data pointing in one direction, the final risk evaluation reaches a different conclusion. As mentioned above, these risk evaluations are an essential element of the regulatory process and it is important that they are done correctly and according to the best science and data available, and with the intent of safeguarding human health.

***Recommendation:** EPA must revisit their determination regarding ambient air exposure. Their data does not support their conclusion of no unreasonable risk.*

**3. EPA failed to sufficiently consider aggregate exposures from multiple conditions of use of 1,4-dioxane and from multiple exposure pathways, as required by TSCA.**

EPA must also revisit how it calculated aggregate exposure. Currently, the draft assessment only aggregates across multiple neighboring facilities within the same condition of use. However, it does not aggregate across multiple exposure routes (including air, water, or contaminated soil) or across multiple conditions of use. EPA has made the erroneous assumption that a person living in close proximity to a facility is only exposed to 1,4-dioxane through one exposure pathway. The intention of a TSCA risk assessment is not to simply assess the size of the population at risk but to also define the full extent of those risks in aggregate. The current draft falls short of that requirement. Failing to fully assess the risk from aggregate exposure underestimates the full extent of the health risk to communities that face exposure from air, water, and contamination of soil. These risks are compounded for community members who are also exposed workers. EPA's current approach does not provide a means for impacted people to fully understand their risk.

***Recommendation:** In order to get a full understanding of the risks, the EPA must do a thorough analysis of exposures through multiple routes associated with the living and working conditions of those who live in fenceline communities. A full analysis requires re-examining gaps in how risk is calculated.*

**4. EPA must explicitly assess the risks posed by 1,4-dioxane to people of color who are fenceline community residents, and formally designate them as a “potentially exposed and susceptible subpopulation” as required by TSCA, and consistent with the President’s Executive Orders on environmental justice.**

Earlier this year, President Biden stated in Executive Order 14096 that “[c]ommunities with environmental justice concerns experience disproportionate and adverse human health or environmental burdens. These burdens arise from ... the concentration of pollution, hazardous

waste, and toxic exposures [...] The cumulative impacts of exposure to those types of burdens and other stressors [...] further disadvantage communities with environmental justice concerns. People in these communities suffer from poorer health outcomes and have lower life expectancies than those in other communities in our Nation.”

To address these issues, the President called for an ambitious approach to environmental justice that is **“informed by scientific research, high-quality data, and meaningful Federal engagement with communities with environmental justice concerns and that uses the tools available to the Federal Government, including enforcement of civil rights and environmental laws.”** We believe that this call is going unanswered by EPA in its current draft risk evaluation for 1,4-dioxane.

Further, TSCA requires EPA to evaluate the risk to “Potentially Exposed or Susceptible Subpopulations”<sup>5</sup> (PESS) using “scientific information, technical procedures, measures, methods, protocols, methodologies, or models, employed in a manner consistent with **the best available science.**”<sup>6</sup> As detailed below, communities of color that are in close proximity to PET plastic and chemical manufacturing facilities are disproportionately exposed to 1,4-dioxane. Further, fenceline communities are closely exposed through multiple pathways and for a longer duration of time than the EPA has calculated.

Such exposures justify the designation of these communities of color as a PESS. To provide an accurate risk assessment and ensure full compliance with TSCA, these errors must be corrected.

**The PET plastic industry releases more 1,4-dioxane than any other industry in the United States.** Industry data reported to EPA pursuant to Toxic Release Inventory (TRI) program show that manufacturers of PET plastic and a petrochemical required to produce PET plastic constitute nine of the top 10 dischargers of 1,4-dioxane to surface water and publicly owned treatment works, and four of the top five emitters of 1,4-dioxane to the air. (See Table 1 below).

**Releases of 1,4-dioxane by the PET plastics industry disproportionately impacts low income communities and people of color.** Fenceline communities whose members live adjacent to PET facilities are lower income and consist of a higher proportion of people of color than the general population. TRI reports show that 12 facilities producing chemicals or resins for the PET supply chain reported 1,4-dioxane releases to air or water in the 2021 (Table 1, Figure 1). Six of these facilities have fenceline communities within a 3-mile radius that have a higher percentage of residents who are people of color compared to the national average. Nine of these PET facilities impact fenceline communities with a higher percentage of low income residents than the whole country. Five PET-related plants meet both of these conditions. Of the more than

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<sup>5</sup> 15 U.S.C. § 2605b(1)(A)

<sup>6</sup> 15 U.S.C. § 2625(h)

832,000 people who live within 3 miles of one of these PET plastic or chemical manufacturing plants, 47% are people of color and 45% are low income.

In order to fully assess the risks associated with 1,4-dioxane exposure, EPA must more completely and precisely assess the risks to the fence-line communities located near and downstream of PET facilities. EPA must do a more in-depth demographic analysis, similar to the analyses that have been developed for recent National Emissions Standards for Hazardous Air Pollutants (NESHAPs), such as for the recent Hazardous Organic NESHAP for the synthetic organic chemical manufacturing industry.

In particular, 1,4-dioxane as a byproduct of the PET industry should be more closely investigated for its impacts on low income and communities of color in accordance with the Agency Guidance on Environmental Justice and National Environmental Policy Act, which “includes six principles for environmental justice analyses to determine any disproportionately high and adverse human health or environmental effects to low-income, minority, and tribal populations.”

Given the demographic trends of the populations most severely impacted by 1,4-dioxane emissions, EPA must consider the disproportionate burden borne by these communities. Centering the President’s commitment to environmental justice requires taking these considerations into full account and doing a more thorough risk assessment that evaluates environmental justice impacts.

**Table 1. Releases of 1,4-dioxane from PET plastic and related chemical plants perpetuates environmental injustice in nearby fenceline communities**

Corporate owner	Operator - Location	PET-related chemical that releases 1,4-dioxane <sup>7</sup>	% POC pop. <sup>8</sup>	% low income pop. <sup>9</sup>	1,4-Dioxane releases to WATER <sup>10</sup>		1,4-Dioxane releases to AIR <sup>11</sup>	
					lbs	Rank	lbs	rank
Far Eastern	APG - Apple Grove, WV	PET	2%	<b>38%</b>	36,667	1	716	14
Indorama <sup>12</sup>	IVL - Decatur, AL	PET	<b>54%</b>	<b>30%</b>	15,810	2	8,329	2
Alpek <sup>13</sup>	DAK <sup>14</sup> - Moncks Corner, SC	PET	18%	8%	14,775	3	1,731	8
Indorama	IVL - Asheboro, NC	PET	<b>41%</b>	<b>46%</b>	9,406	4	154	23
Alpek	DAK - Fayetteville, NC	PET	39%	<b>38%</b>	2,611	7	885	11
Dow	Dow - Seadrift, TX	MEG	<b>48%</b>	<b>46%</b>	991	8	4,709	6
Dow	Dow - Taft, LA	MEG	26%	25%	846	9	7,063	4
Formosa	NanYa - Lake City, SC	PET	<b>79%</b>	<b>53%</b>	420	10	1,712	9
Indorama	IVL - Spartansburg, SC	PET	<b>68%</b>	<b>39%</b>	230	11	809	13
Alpek	DAK - Bay St Louis, MS	PET	9%	17%	28	12	1,447	10
Alpek	DAK - Columbia, SC	PET	<b>62%</b>	<b>47%</b>	0	-	7,740	3
Indorama	IVL - Port Neches, TX	MEG	39%	<b>36%</b>	0	-	317	17

Values in **red** denote locations where:

- Percent POC population is greater than the US overall percent POC population in 2021 (41%), and
- Percent low income population is greater than the US overall low income population in 2021 (28%).

<sup>7</sup> PET - Polyethylene terephthalate plastic; MEG - monoethylene glycol, a pre-monomer necessary for PET plastic production. The production of MEG and PET both result in releases of 1,4-dioxane driven by demand for PET plastic, primarily for use in making single-use plastic beverage bottles and polyester clothing. For details see Defend Our Health (2023). *Hidden Hazards: The chemical footprint of a plastic bottle*.

[https://defendourhealth.org/wp-content/uploads/2023/05/FINAL-DOH-PlasticBottles-Report\\_5.20.2023.pdf](https://defendourhealth.org/wp-content/uploads/2023/05/FINAL-DOH-PlasticBottles-Report_5.20.2023.pdf).

<sup>8</sup> Percent People of Color (POC) population within a 3 mile radius from facility location. Data from Environmental Justice Screening and Mapping Tool (EJScreen) <https://ejscreen.epa.gov/mapper/>, US Environmental Protection Agency. Accessed Aug 15, 2023.

<sup>9</sup> Percent low income population within a 3 mile radius from facility location. Data from Environmental Justice Screening and Mapping Tool (EJScreen) <https://ejscreen.epa.gov/mapper/>, US Environmental Protection Agency. Accessed Aug 15, 2023.

<sup>10</sup> Water releases are the sum of surface discharge and POTW transfer. Air releases are the sum of fugitive and stack releases. Data were obtained from:

[https://enviro.epa.gov/triexplorer/release\\_fac?p\\_view=USFA&trilib=TRIQ1&sort=RE\\_TOLBY&sort\\_fmt=2&state=All+states&county=All+counties&zipcode=&epa\\_region=&chemical=0000123911&industry=ALL&YEAR=2021&V\\_NA\\_INDICATOR=&tab\\_rpt=1&FLD=RELLBY&FLD=TSFDSP](https://enviro.epa.gov/triexplorer/release_fac?p_view=USFA&trilib=TRIQ1&sort=RE_TOLBY&sort_fmt=2&state=All+states&county=All+counties&zipcode=&epa_region=&chemical=0000123911&industry=ALL&YEAR=2021&V_NA_INDICATOR=&tab_rpt=1&FLD=RELLBY&FLD=TSFDSP), accessed 8/25/2023;

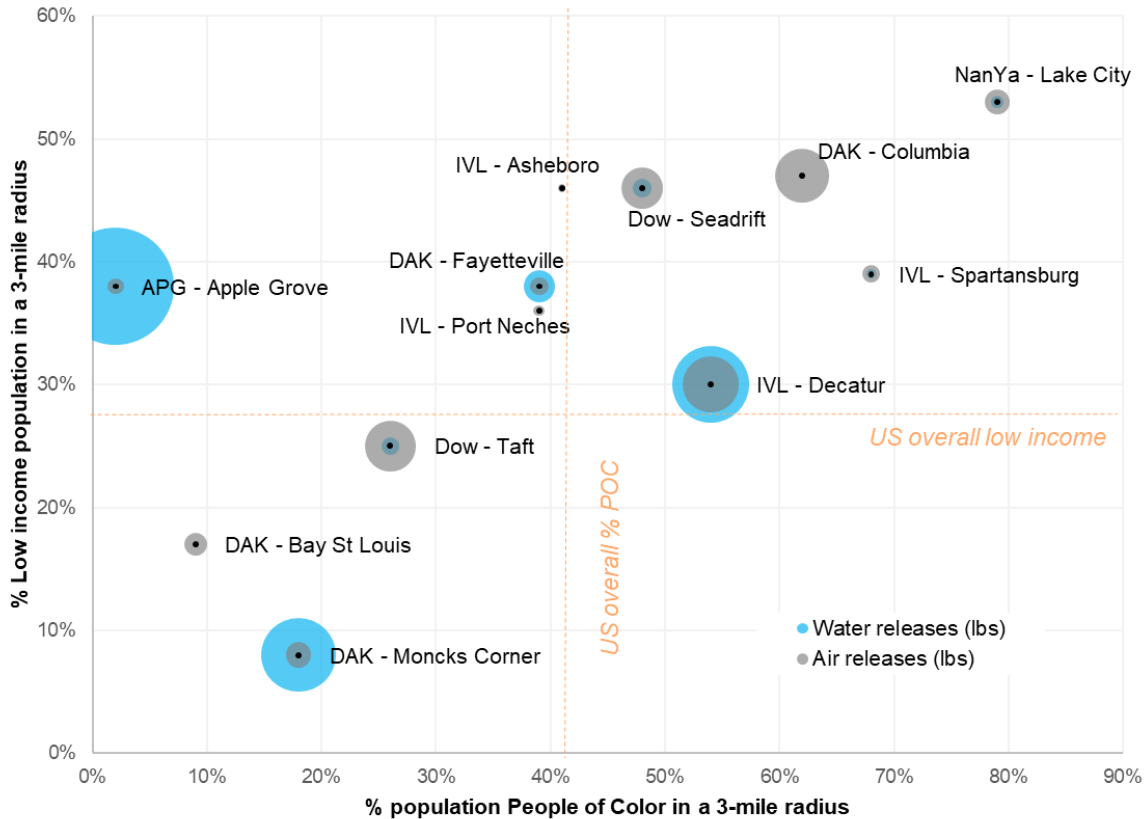
<sup>11</sup> Ibid.

<sup>12</sup> Indorama is Indorama Ventures Ltd. (IVL)

<sup>13</sup> Alpek in turn is owned by Grupo Industrial Alfa (GIA)

<sup>14</sup> DAK is DAK Americas, which is owned by Alpek/Alfa

**Figure 1. People of color and low-income community residents who live near PET plastics and related chemical plants bear a disproportionate burden of 1,4-dioxane releases**



**The EPA must also re-examine their assumption of 33 years of exposure for Lifetime Average Daily Dose.** This is not realistic and does not reflect the reality of geographic mobility in this country. Between 1947 and 2021, the United States Census Bureau tracked more than 2.5 billion moves, 1.6 billion of which occurred within the same county.<sup>15</sup> When people move, they generally do not move very far. In fact, people with lower socioeconomic status backgrounds typically move to neighborhoods similar to the ones in which they initially reside, even if they attain higher income levels.<sup>16</sup> Assuming that a person from a fenceline community is only

<sup>15</sup> U.S. Census Bureau, “CPS Historical Migration/Geographic Mobility Tables, Table A-1: Annual Geographic Mobility Rates by Type of Movement – 1948-2022,” Accessed: September 6, 2023, <https://www.census.gov/data/tables/time-series/demo/geographic-mobility/historic.html>.

<sup>16</sup> Hajat, A., MacLehose, R. F., Rosofsky, A., Walker, K. D., & Clougherty, J. E. (2021). Confounding by Socioeconomic Status in Epidemiological Studies of Air Pollution and Health: Challenges and Opportunities. *Environmental health perspectives*, 129(6), 65001. <https://doi.org/10.1289/EHP7980>



exposed to 1,4-dioxane for 33 years risks results in an underestimate of lifetime exposure and leads to an erroneous understatement of health risks.

***Recommendation:** EPA must center the President's call for environmental justice and honor the Congressional intent of TSCA in their analysis of the risks associated with 1,4-dioxane. They must take into account the unique challenges associated with fenceline communities as they calculate exposure. Failure to understand the communities that they serve will result in an erroneous risk calculation. They must also control emissions at the source and cut down PET production.*

## CONCLUSION

**It's clear that PET plastic poses an unreasonable risk to human health.** That's because the production of PET plastic and its precursor chemical known as MEG results in worker exposure to 1,4-dioxane and community exposure from the discharge of 1,4-dioxane into drinking water sources of downstream communities, each of which EPA rightly concluded pose an unreasonable risk to human health.

Further, EPA has understated the risk to human health from PET production by improperly failing to conclude the air emissions of 1,4-dioxane also pose an unreasonable risk, and by failing to fully evaluate real-world aggregate exposures to 1,4-dioxane from multiple conditions of use and multiple exposure pathways.

Further, EPA has failed to properly assess the risks of 1,4-dioxane to environmental justice communities, and improperly neglected to designate people of color and low-income people as a potential exposed and susceptible subpopulation who must be protected under TSCA. This shortcoming contradicts the clear intent of the environmental justice policies of the Biden Administration.

We strongly urge EPA to correct these deficiencies prior to finalizing the 2023 Draft Supplement to the 1,4-Dioxane Risk Evaluation. Thank you in advance for your consideration of these comments.