May 20, 2020

Howard Zucker, M.D., J.D., Commissioner
New York State Department of Health
Corning Tower
Empire State Plaza
Albany, NY 12237

Re: Moving forward on the proposed Maximum Contaminant Levels for perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), and 1,4-dioxane

cc: Governor Andrew Cuomo
Basil Seggos, Commissioner, Department of Environmental Conservation
Paul Francis, Deputy Secretary for Health
Kimberly Harriman, Acting Deputy Secretary for Energy & Environment
Roger Sokol, Department of Health
Katherine Ceroalo, Department of Health

Dear Commissioner Zucker:

On behalf of the undersigned organizations, we thank you for the work you are doing to navigate New York State through the deadly COVID-19 pandemic. At a time when strong leadership is sorely needed to steer us through this crisis, we are grateful for the role that Governor Cuomo, you, and your team at the Department of Health are playing in leading the state, the country and the world on our COVID-19 response.

Though we appreciate that much of your attention is rightly diverted to the pandemic, we know that many New Yorkers are also depending on your strong leadership to address the issue of drinking water contaminated by PFAS chemicals and 1,4-dioxane. The Public Health and Health Planning Council was set to vote on the Department's proposed Maximum Contaminant Level (MCL) regulations for these chemicals at an April meeting, but this meeting was postponed due to the COVID-19 crisis. **We ask that the June 4th meeting of the Council move forward as planned, perhaps in the virtual meeting environment that we all have found ourselves in, in order to finalize the MCL rulemaking process.**

We continue to urge you to adopt the most health-protective MCLs for PFOA, PFOS, other PFAS, and 1,4-dioxane that will protect New Yorkers from contaminated drinking water, without the deferral provision introduced earlier this year. Please find attached our comments from March 9th.

During this COVID-19 crisis, we would like to underscore how important clean water continues to be for all New Yorkers, not only for safe drinking water but also for handwashing and good hygiene. Moving forward on the MCLs for these toxic chemicals will safeguard public health and ensure that our most vulnerable populations have the clean water they need to stay safe and healthy.

We thank you for your leadership on COVID-19 and also in your efforts to ensure clean water for all New Yorkers.

Sincerely,

Alok Disa
Earthjustice

Maureen Cunningham & Rob Hayes
Environmental Advocates of New York

Eric Weltman
Food & Water Action

Yvonne Taylor
Gas Free Seneca

Manna Jo Greene
Hudson River Sloop Clearwater, Inc.

Ophra Wolf
Newburgh Clean Water Project

Elizabeth Moran
NYPIRG

Michele Baker
New York Water Project

Peter Smith
Quassaick Creek Watershed Alliance

Loreen Hackett
PfoaProjectNY

Victoria Leung
Riverkeeper, Inc.

Joseph Campbell
Seneca Lake Guardian, A Waterkeeper Affiliate

March 9, 2020

Howard Zucker, M.D., J.D., Commissioner
New York State Department of Health
Corning Tower
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Albany, NY 12237

Re: Proposed Maximum Contaminant Levels for perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), and 1,4-dioxane

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Basil Seggos, Commissioner, Department of Environmental Conservation
Paul Francis, Deputy Secretary for Health
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Roger Sokol, Department of Health
Katherine Ceroalo, Department of Health

Dear Commissioner Zucker:

On behalf of the undersigned organizations, we thank you for the opportunity to submit comments on the New York State Department of Health's proposed Amendments to Subpart 5-1 of Title 10 NYCRR to establish Maximum Contaminant Levels (MCLs) for perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), and 1,4-dioxane.

In December 2018, the New York State Drinking Water Quality Council issued MCL recommendations of 10 parts per trillion (ppt) for PFOA, 10 ppt for PFOS, and 1 part per billion (ppb) for 1,4-dioxane. On July 24, 2019, the NYS Department of Health published Amendments to Subpart 5-1 of Title 10 NYCRR, marking the start of a 60-day public comment period and proposing the 2018 NYS Water Quality Council recommendations as MCLs. On January 22, 2020, the NYS Department of Health revised Subpart 5-1 of Title 10 NYCRR to include a new subdivision (p) to Section 5-1.51, which outlines a new program in which systems "may request that the State defer actions for determining MCL violations" for up to 24 months past the effective date of the MCLs, with an additional twelve months "if the system establishes to the satisfaction of the State that it is taking all practical steps to meet the corrective action plan on which the initial deferral was conditioned."

As stated on the Department of Health's website, the mission of the Department is to "protect, improve and promote the health, productivity and well being of all New Yorkers." With public health as the utmost priority, we urge the Department to adopt final drinking water standards for PFOA, PFOS, and 1,4-dioxane that will be most protective of the health, productivity and well-being of New Yorkers by utilizing all available scientific research and knowledge at your disposal and moving forward with the strongest regulations possible. We urge the Department to focus wholly on your stated mission of public health when finalizing the rulemaking.

Our organizations believe that *the first and only priority in establishing Maximum Contaminant Levels is to protect human health from contaminants in drinking water.* The Department of Health must do everything in its power to ensure that all New Yorkers, including the most vulnerable residents of the state, can rely on and trust the safety of their public water supplies. There is, therefore, the greatest urgency to establish stringent MCLs for PFOA, PFOS, and 1,4-dioxane to align with the most protective health science. Over a year has passed since the NYS Drinking Water Quality Council first proposed its recommended MCLs, and science has emerged in that time that indicates that there is likely no safe level of these contaminants in drinking water. We urge the Department to continue to strengthen, not weaken, these drinking water standards through the existing rulemaking process.

Specifically, our organizations are calling for the following:

- **Rescind the deferral provision proposed in the revised rulemaking on January 22, 2020.** A deferral system risks slowing the installation of treatment technology, potentially exposing New Yorkers to toxic drinking water for longer. Water suppliers may be granted years to install granulated activated carbon (GAC) filtration for PFOA or PFOS contamination, even though GAC filtration is readily available and can be quickly installed. The proposed regulations do not specify any criteria for the Department to use when judging whether a water supplier should receive a deferral, increasing the risk that unnecessary deferrals may be granted. The proposed deferral system also requires less frequent and less robust public notification of health risks posed by contamination found in the state's drinking water supplies. After a water supplier detects PFOA, PFOS, or 1,4-dioxane in exceedance of the MCL, the Department of Health's proposal allows the supplier, after an initial public notification, to issue public notices only once a year. This new scheme bypasses the standard notification protocol for exceedances of other regulated organic chemicals, which ensures public notification every three months. Moreover, the proposed revision fails to specify the content of these public notifications, leaving open the possibility that specific testing results, like the actual contaminant level, could be kept from the public. Under current Department of Health regulations, such information and more must be included in public notification when there is a violation or "a situation posing a risk to public health."[1] Since the deferral system avoids a formal MCL violation, robust public notification would only be triggered when contamination is "posing a risk to public health" - a determination that can only be made by the Department or the impacted water supplier. Under this scheme, the public could potentially be left in the dark about potential health risks posed by their drinking water supplies. *We call on the Department to rescind these new provisions developed exclusively for these three chemicals. We believe the new provisions call into question the transparency and accountability of the process.*

- **Establish a combined MCL of 2 ppt for PFOA and PFOS.** A 2019 study published by the Natural Resources Defense Council (NRDC) found that there is likely no safe level of exposure

[1] New York Codes, Rules, and Regulations, Section 5-1.78(b)1.

to PFAS chemicals.[2] Additionally, a leading expert in this field has stated that the safety threshold for PFOA in water should be as low as 0.1 ppt, which is 700 times lower than the US Environmental Protection Agency's (EPA) current advisory level.[3] Treatment technology is currently capable of treating PFOA and PFOS as low as 2 ppt. *As technology becomes more advanced, the Department of Health needs to respond with lower MCLs to minimize New Yorkers' exposure to these toxic chemicals.*

- **Establish an MCL of 0.3 ppb for 1,4-dioxane.** The EPA conducted a cancer risk assessment for 1,4-dioxane, which indicated a concentration of 0.35 ppb in drinking water elevates the risk for cancer.[4] Based on this assessment and their own analysis, Massachusetts has a similar drinking water guidance level of 0.3 ppb. *Massachusetts' level was set at stringent levels to "err on the side of protecting public health."[5] New York should do the same.*

- **Establish MCL(s) for additional PFAS chemicals.** It is widely suspected that all per- and polyfluoroalkyl (PFAS) substances are likely to have similar negative health impacts as PFOA and PFOS. According to the Natural Resources Defense Council (NRDC), "our review suggests a combined MCL of 2 ppt is feasible for PFOA, PFOS, PFNA, and PFHxS, with a separate MCL of 5 ppt for GenX. Laboratory methods support a reporting limit of 2 ppt with EPA Method 537.1 (5 ppt for GenX), and therefore all water testing should be required to achieve this limit for the PFAS chemicals detectable with this method."[6] We agree with NRDC's recommendation and *urge the Department of Health to establish a combined MCL of 2 ppt for not only PFOA and PFOS, but also PFNA and PFHxS, and a separate MCL of 5 ppt for GenX, until technology allows for these levels to be lowered even further.*

- **Reject the phased-in testing schedule outlined in the Notice of Proposed Rulemaking.** Testing for PFOA, PFOS, and 1,4-dioxane is not new. Water systems in New York serving 10,000 or more residents tested for these three contaminants under the EPA's Third Unregulated Contaminant Monitoring Rule (UCMR-3) in the period from 2013 to 2015. To ensure that the public is not exposed to unsafe levels of these contaminants further, it is critical to begin testing as soon as possible. However, the Department of Health has proposed that small systems do not have to begin testing until six months after adoption. *All systems, regardless of size, should begin testing within 60 days of adoption of the final MCLs.*

- **Previous tests for PFOA, PFOS, and 1,4-dioxane should not satisfy initial testing requirements.** The Department of Health has indicated that it will consider requests from

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[2] Anna Reade, Ph.D., "Scientific and Policy Assessment for Addressing Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water," April 2019, https://www.nrdc.org/resources/michigan-pfas-2019-scientific-and-policy-assessment-addressing-pfas-chemicals-drinking

[3] Sharon Lerner, "TEFLON TOXIN SAFETY LEVEL SHOULD BE 700 TIMES LOWER THAN CURRENT EPA GUIDELINE," The Intercept, June 18, 2019, https://theintercept.com/2019/06/18/pfoa-pfas-teflon-epa-limit/

[4] EPA, "Technical Fact Sheet – 1,4-Dioxane," November 2017, https://www.epa.gov/sites/production/files/2014-03/documents/ffrro_factsheet_contaminant_14-dioxane_january2014_final.pdf

[5] Massachusetts Department of Environmental Protection, "FAQ's: 1,4-Dioxane," Accessed August 2, 2019, https://www.mass.gov/service-details/faqs-14-dioxane

[6] Anna Reade, Ph.D., "Scientific and Policy Assessment for Addressing Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water," April 2019, https://www.nrdc.org/resources/michigan-pfas-2019-scientific-and-policy-assessment-addressing-pfas-chemicals-drinking

drinking water suppliers to use prior testing to "satisfy some or all of the initial monitoring requirements."[7] Initial monitoring requirements, which for most public water supplies require quarterly sampling per entry point for the first year following adoption of the regulation, should be mandatory for all water suppliers. While these contaminants may not have been detected in a community under previous testing, testing methods may have changed, and there is always the possibility of pollution migration. *It is important for all water systems to test following the adoption of MCLs in order to establish a baseline of data across the state.*

In closing, we wish to underscore this incredible opportunity for New York State to lead the nation, by establishing the most health-protective MCLs for PFOA, PFOS, other PFAS chemicals, and 1,4-dioxane that will protect New Yorkers from contaminated drinking water and restore a greater accountability and transparency in the Department of Health to protect public health. We urge the Department of Health to err on the side of caution and recent science and help restore the public trust in the state to protect New Yorkers from contaminated drinking water.

Attached to this letter, you will also find the comments our organizations submitted on September 23, 2019 to further detail our positions.

We thank you for your consideration of our comments and your ongoing efforts to protect public health.

Sincerely,

Maureen Cunningham & Rob Hayes
Environmental Advocates of New York

Eric Weltman
Food & Water Action

Alok Disa
Earthjustice

Elizabeth Moran
NYPIRG

Victoria Leung
Riverkeeper, Inc.

Joseph Campbell
Seneca Lake Guardian, A Waterkeeper Alliance Affiliate

Yvonne Taylor
Gas Free Seneca

[7] New York State Department of Health, Regulatory Impact Statement at 33, https://regs.health.ny.gov/sites/default/files/proposed-regulations/Maximum%20Contaminant%20Levels%20%28MCLs%29_0.pdf

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New York Water Project

Jill Jedlicka
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Loreen Hackett
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Manna Jo Greene
Hudson River Sloop Clearwater

Patty Katz
Reach Out America

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Karen Blumer
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Larry Federman
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September 23, 2019

Howard Zucker, M.D., J.D., Commissioner
New York State Department of Health
Corning Tower
Empire State Plaza
Albany, NY 12237

Re: Proposed Maximum Contaminant Levels for perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), and 1,4-dioxane

cc: Governor Andrew Cuomo
Basil Seggos, Commissioner, Department of Environmental Conservation
Paul Francis, Deputy Secretary for Health
Dale Bryk, Deputy Secretary for Energy & Environment
Roger Sokol, Department of Health
Lloyd Wilson, Department of Health
Katherine Ceroalo, Department of Health

Dear Commissioner Zucker:

On behalf of Environmental Advocates of New York, Food & Water Watch, and the New York Public Interest Research Group (NYPIRG) with the support of the undersigned organizations and elected officials, we thank you for the opportunity to submit comments on the New York State Department of Health's proposed Amendments to Subpart 5-1 of Title 10 NYCRR to establish Maximum Contaminant Levels (MCLs) for perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), and 1,4-dioxane.

In December 2018, the New York State Drinking Water Quality Council issued MCL recommendations of 10 parts per trillion (ppt) for PFOA, 10 ppt for PFOS, and 1 part per billion (ppb) for 1,4-dioxane. On July 24, 2019, the NYS Department of Health published Amendments to Subpart 5-1 of Title 10 NYCRR, marking the start of a 60-day public comment period and proposing these NYS Water Quality Council recommendations as MCLs.

I. Overview of Recommendations

As noted on the NYS Department of Health website, your mission is to "protect, improve and promote the health, productivity and well being of all New Yorkers." We write to urge the Department of Health to adopt final drinking water standards for PFOA, PFOS, and 1,4-dioxane that will be most protective of the health, productivity and well-being of New Yorkers by utilizing all available scientific research and knowledge at your disposal, including new data that has emerged in 2019 after the last Drinking Water Quality Council meeting in December 2018. Our organizations believe that the purpose of establishing Maximum Contaminant Levels is to protect human health from contaminants in drinking water. The Department of Health must do everything in its power to ensure that all New Yorkers, including the most vulnerable residents of the state, can rely on and trust the safety of their public water supplies. There is, therefore, the greatest urgency to establish the strongest possible MCLs for PFOA, PFOS, and 1,4-dioxane, which are all dangerous chemicals that have already contaminated known drinking water supplies across the state and have potentially contaminated many more.

Specifically, our organizations are calling for the following, which we detail in subsequent sections:

- **Establish a combined MCL of 2 ppt for PFOA and PFOS.** A recent study published by the Natural Resources Defense Council (NRDC) found that there is likely no safe level of exposure to PFAS chemicals.[8] Additionally, the nation's top toxicologist has stated that the safety threshold for PFOA in water should be as low as 0.1 ppt, which is 700 times lower than the US Environmental Protection Agency's (EPA) current advisory level.[9] Treatment technology is currently capable of treating PFOA and PFOS as low as 2 ppt. *As technology becomes more advanced, the Department of Health should respond with lower MCLs to minimize New Yorkers' exposure to these toxic chemicals.*

- **Establish an MCL of 0.3 ppb for 1,4-dioxane.** The EPA conducted a cancer risk assessment for 1,4-dioxane, which indicated a concentration of 0.35 ppb in drinking water elevates the risk for cancer.[10] Based on this assessment and their own analysis, Massachusetts has a similar drinking water guidance level of 0.3 ppb. *Massachusetts' level was set at stringent levels to "err on the side of protecting public health."*[11] *New York should do the same.*

- **Establish MCL(s) for additional PFAS chemicals.** It is widely suspected that all per- and polyfluoroalkyl (PFAS) substances are likely to have similar negative health impacts as PFOA and PFOS. According to the Natural Resources Defense Council (NRDC), "our review suggests a combined MCL of 2 ppt is feasible for PFOA, PFOS, PFNA, and PFHxS, with a separate MCL of 5 ppt for GenX. Laboratory methods support a reporting limit of 2 ppt with EPA Method 537.1 (5 ppt for GenX), and therefore all water testing should be required to achieve this limit for the

[8] Anna Reade, Ph.D., "Scientific and Policy Assessment for Addressing Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water," April 2019, https://www.nrdc.org/resources/michigan-pfas-2019-scientific-and-policy-assessment-addressing-pfas-chemicals-drinking
[9] Sharon Lerner, "TEFLON TOXIN SAFETY LEVEL SHOULD BE 700 TIMES LOWER THAN CURRENT EPA GUIDELINE," The Intercept, June 18, 2019, https://theintercept.com/2019/06/18/pfoa-pfas-teflon-epa-limit/
[10] EPA, "Technical Fact Sheet – 1,4-Dioxane," November 2017, https://www.epa.gov/sites/production/files/2014-03/documents/ffrro_factsheet_contaminant_14-dioxane_january2014_final.pdf
[11] Massachusetts Department of Environmental Protection, "FAQ's: 1,4-Dioxane," Accessed August 2, 2019, https://www.mass.gov/service-details/faqs-14-dioxane

PFAS chemicals detectable with this method."[12] We agree with NRDC's recommendation and *urge the Department of Health to establish a combined MCL of 2 ppt for not only PFOA and PFOS, but also PFNA and PFHxS, and a separate MCL of 5 ppt for GenX, until technology allows for these levels to be lowered even further.*

- **Reject the phased-in testing schedule outlined in the Notice of Proposed Rulemaking.** Testing for PFOA, PFOS, and 1,4-dioxane is not new. Water systems in New York serving 10,000 or more residents tested for these three contaminants under the EPA's Third Unregulated Contaminant Monitoring Rule (UCMR-3) in the period from 2013 to 2015. To ensure that the public is not exposed to unsafe levels of these contaminants further, it is critical to begin testing as soon as possible. However, the Department of Health has proposed that small systems do not have to begin testing until six months after adoption. *All systems, regardless of size, should begin testing within 60 days of adoption of the final MCLs.*

- **Previous tests for PFOA, PFOS, and 1,4-dioxane should not satisfy initial testing requirements.** While these contaminants may not have been detected in a community previously, there is always the possibility of pollution migration. *It is important for all water systems to test following the adoption of MCLs in order to establish a baseline of data across the state.*

- **Require 24-hour public notification of MCL violations and exceedances for any health advisory levels, Maximum Contaminant Level Goals (MCLG), and any other regulatory guidance.** Under the Department of Health's current drinking water program public notification requirements, there are three tiers for public notification. Tier 1 notification requires notification to the Department of Health and the public no later than 24 hours after the system learns of a public health hazard.[13] Tier 1 requirements should be applied to all water supply operators, county governments, and any contractors and consultants, across the board for regulated contaminants, and should also be applied to any contaminants with state or federal health advisory levels, MCLGs, or other guidance levels. *The public deserves prompt notification regarding contaminants in their drinking water so they can make informed decisions to protect their health and safety.*

II. Scope of PFOA, PFOS, and 1,4-Dioxane Contamination across the United States and in New York State

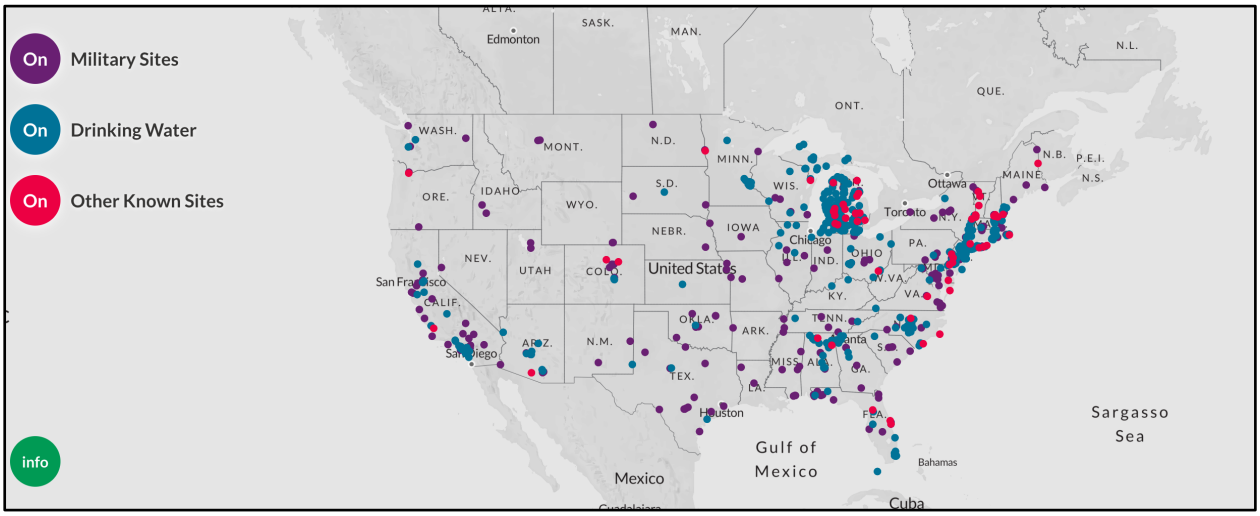
PFOA and PFOS and the 3,300-5,000 other chemicals in the PFAS class are known as "forever chemicals" because of specific properties such as not breaking down easily and persisting in the human body and the environment for long periods of time. Added to that is their widespread use by industry and in many common consumer, household and food products. It is estimated that most people in the United States have one or more PFAS chemicals in their blood, most commonly PFOA or PFOS.[14] PFAS

[12] Anna Reade, Ph.D., "Scientific and Policy Assessment for Addressing Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water," April 2019, https://www.nrdc.org/resources/michigan-pfas-2019-scientific-and-policy-assessment-addressing-pfas-chemicals-drinking
[13] "Public Notification Requirements," NYS Department of Health, https://www.health.ny.gov/environmental/water/drinking/pnr.htm
[14] PFAS Blood Testing, Agency for Toxic Substances and Disease Registry, January 2018, https://www.atsdr.cdc.gov/pfas/pfas-blood-testing.html.

chemicals can also be found in human urine[15] and breastmilk[16] as well as in dairy products.[17] These chemicals persist in the human body for two to four years for PFOA and five to six years for PFOS.[18]

Drinking water is only one source of PFAS contamination in our environment and potential source for human exposure. These chemicals can also be found in soil, rivers, lakes and other waterways as well as in air and dust, carpeting, food, and food packaging. A few predictors of the presence of these chemicals in public water supplies include the number of industrial sites that manufacture or use these chemicals, the number of military fire training areas, and the number of wastewater treatment plants.[19] In fact, each additional military site within a HUC-8 watershed is linked to a 10 percent increase in PFOA and a 35 percent increase in PFOS.[20]

As of July 2019, the Environmental Working Group reports that there are at least 712 sites in 49 states that are known to be contaminated, with 38 sites in New York State. This includes military sites, drinking water supplies, and other sites with known contamination.[21] The following map depicts these sites, and shows the extent of known contamination in the United States, with new sites being added over time:



Source: Environmental Working Group and Northeastern University SSEHR, PFAS Contamination in the US, August 2019, https://www.ewg.org/interactive-maps/2019_pfas_contamination/map/

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[15] Hartmann et al, Perfluoroalkylated substances in human urine:
results of a biomonitoring pilot study, Biomonitoring 2017; 4: 1–10, https://www.degruyter.com/downloadpdf/j/bimo.2017.4.issue-1/bimo-2017-0001/bimo-2017-0001.pdf.

[16] Goeden et al, A transgenerational toxicokinetic model and its use in derivation of Minnesota PFOA water guidance, Journal of Exposure Science & Environmental Epidemiologyvolume 29, pp 183–195 (2019), https://www.nature.com/articles/s41370-018-0110-5.

[17] FDA Issues Statement, Posts New Data on PFAS, Confirming Safety of Dairy Products, June 2019, International Dairy Foods Association, https://www.idfa.org/news-views/headline-news/article/2019/06/12/fda-issues-statement-posts-new-data-on-pfas-confirming-safety-of-dairy-products

[18] An Overview of Perfluoroalkyl and Polyfluoroalkyl Substances and Interim Guidance for Clinicians Responding to Patient Exposure Concerns, Agency for Toxic Substances and Disease Registry, June 2017,
https://www.atsdr.cdc.gov/pfc/docs/pfas_clinician_fact_sheet_508.pdf.

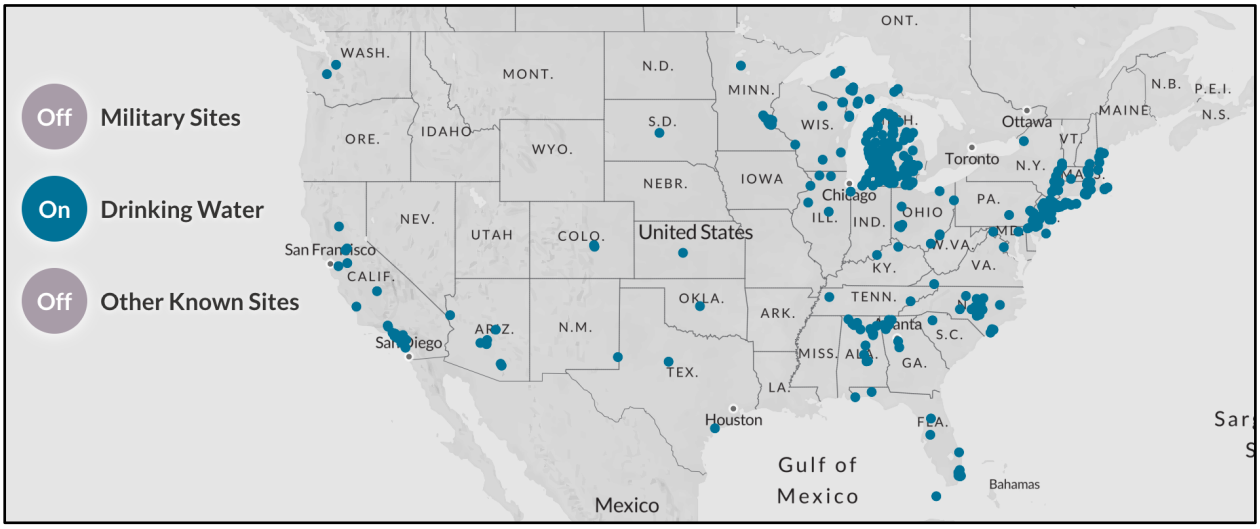
[19] Xindi C. Hu et al., Detection of Poly- and Perfluoroalkyl Substances (PFASs) in U.S. Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants, Environmental Science and Technology Letters 344-350 (2016),
https://pubs.acs.org/doi/10.1021/acs.estlett.6b00260.

[20] Ibid, p. 344.

[21] PFAS Map Update: New Data Show Scope of Known Contamination Still Growing, https://www.ewg.org/release/pfas-map-update-new-data-show-712-contamination-sites-49-states

Under the EPA's Third Unregulated Contaminant Monitoring Rule (UCMR-3), the EPA collected data from public water systems serving over 10,000 people for chemicals that are suspected contaminants in drinking water, including in particular, 1,4-dioxane and six PFAS chemicals: perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), perfluorobutanesulfonic acid (PFBS).[22] The results showed that 1,077 of 4,915 public water systems with results, or 22 percent, tested above the minimum reporting level of 0.07 parts per billion for 1,4-dioxane and 341 public water systems, or seven percent, tested above the reference concentration of 0.35 parts per billion. The results showed that 375 public water systems of 4,920 public water systems with results, or eight percent, tested above the minimum reporting level for at least one of the six PFAS chemicals (minimum reporting levels: PFOS - 40 ppt, PFOA - 20 ppt, PFNA - 20 ppt, PFHxS - 30 ppt, PFHpA - 10 ppt, PFBS - 90 ppt) in addition to 46 public water systems above the reference concentration of 70 ppt for PFOS and 13 above the reference concentration of 70 ppt for PFOA.[23] In New York, the UCMR-3 testing showed 11 percent of the water systems tested in New York had 1,4-dioxane levels above one part per billion and 18 percent over 0.35 parts per billion.[24]

According to the Environmental Working Group, drinking water systems serving an estimated 19 million people are known to be contaminated with PFAS chemicals.[25] The extent of this drinking water contamination is depicted in the following map:



Source: Environmental Working Group and Northeastern University SSEHR, PFAS Contamination in the US, August 2019, https://www.ewg.org/interactive-maps/2019_pfas_contamination/map/

In New York State, we do not know the full extent of PFAS and 1,4-dioxane contamination of drinking water, since testing under the UCMR-3 was only for public water systems serving over 10,000 people. Only 196 water systems in New York conducted testing under UCMR-3. Of the systems that conducted

[22] Third Unregulated Contaminant Rule, US EPA, https://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule.
[23] The Third Unregulated Contaminant Monitoring Rule (UCMR 3): Data Summary, January 2017, US EPA, https://www.epa.gov/sites/production/files/2017-02/documents/ucmr3-data-summary-january-2017.pdf.
[24] Amendment of Subpart 5-1 of Title 10 NYCRR (Maximum Contaminant Levels (MCLs)),
[25] PFAS Chemicals Must Be Regulated as a Class, Not One by One, Environmental Working Group, May 6, 2019, https://www.ewg.org/release/mapping-pfas-contamination-crisis-new-data-show-610-sites-43-states

testing, an analysis conducted by NYPIRG found that drinking water for over 2.8 million New Yorkers have levels of 1,4-dioxane in their drinking water supplies above 0.3 parts per billion (the health guidance level in Massachusetts) , and drinking water for more than 1.4 million New Yorkers contained levels of PFOA/PFOS above the most stringent levels recommended in 2018.[26] Under the Department of Health's proposed MCLs, millions of New Yorkers would still be exposed to levels exceeding the most health protective levels.

The following represents the populations impacted by PFOA, PFOS, and 1,4-dioxane in New York State:

	1,4 dioxane health risk limit (ppb)	Population affected by 1,4-dioxane	PFOA/PFOS health risk limit	Population affected by PFOA/PFOS
Environmental groups' recommended limit[27]	.3 parts per billion	2,840,646	4-10 parts per trillion	1,450,000
U.S. EPA findings	.35 parts per billion[28]	2,793,492	.07 parts per billion[29]	1,170,500

Source: *What's In My Water? Emerging Contaminants in New York's Drinking Water Systems,* New York Public Interest Research Group, May 2019.

We note that in the NYS Department of Health's regulatory impact statement for the MCL rulemaking process, of the 278 medium (serving 3,300 to 10,000 persons) and small (serving fewer than 3,300 persons) community water systems and non-transient noncommunity systems sampled between 2015 and 2018, 93 systems, a third of the sample, detected levels of PFOA between 2 ppt and 10 ppt, and 76 systems, over a quarter of the sample, detected levels of PFOS between 2 ppt and 10 ppt.[27] Under the Department of Health's proposed MCLs, these public systems would not be required to remove these harmful chemicals from their drinking water because their levels fall under the proposed MCL of 10 ppt. *Further, it is not known at this time whether these systems or the public they serve have been notified of these results, nor do we have further information about which systems these represent. If they have not already done so, we urge the Department of Health to notify these 278 public water systems of these results, who should then notify the public, in the interest of transparency and public safety.*

1,4-dioxane is especially prevalent on Long Island, with dozens of drinking water sources detecting the chemical at levels that far exceed EPA's lifetime cancer risk guideline of 0.35 ppb. Nassau and Suffolk water suppliers have reported the highest levels of 1,4-dioxane contamination in the nation, according to the Citizens Campaign for the Environment.[28] There are an estimated 185 drinking water wells on Long Island contaminated with 1,4-dioxane, which will cost an estimated $840 million to clean up.[29]

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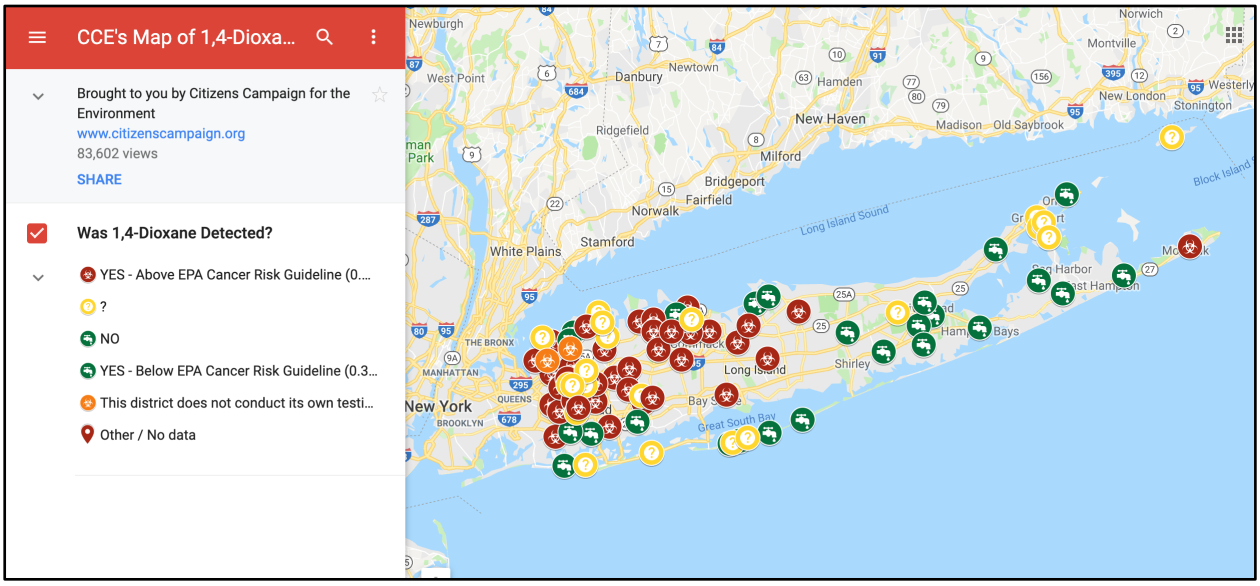
[26] During 2018, advocates recommended a combined MCL of 4 ppt. With additional science, discussed further in our comments, advocates now recommend a lower level of 2 ppt.
[27] New York State Department of Health, Amendment of Subpart 5-1 of Title 10 NYCRR (Maximum Contaminant Levels (MCLs), https://regs.health.ny.gov/sites/default/files/proposed-regulations/Maximum%20Contaminant%20Levels%20%28MCLs%29.pdf
[28] Protect Drinking Water from 1,4-dioxane, 2019, Citizens Campaign for the Environment, https://www.citizenscampaign.org/14dioxane
[29] Water providers put cost for 1,4-dioxane treatment systems at $840M, February 14, 2019, Newsday, https://www.newsday.com/long-island/1-4-dioxane-cleanup-costs-1.27268149

Citizens Campaign for the Environment has mapped the sites with 1,4-dioxane on Long Island, which is depicted here:



Source: Citizens Campaign for the Environment, https://www.citizenscampaign.org/14dioxane (accessed in September 2019).

Without MCLs and without comprehensive testing of these emerging contaminants in New York State, any public water systems serving fewer than 10,000 people, in addition to people served by private wells, do not know whether or not their drinking water has been contaminated with PFOA, PFOS, or 1,4-dioxane. There were 2,075 water systems that did not have any UCMR-3 testing, leaving 2,373,089 New Yorkers, plus approximately 4 million residents relying on private wells, unclear whether their drinking water contains 1,4-dioxane, PFOA, PFOS, and other contaminants.

The Village of Hoosick Falls, NY is a case in point: With a population of 3,399, the village was not required under UCMR-3 to test for PFOA in its water due to its small size, and did not find out about the contamination of its water supply until a local resident had the water tested. In the time since PFAS chemicals were found in Hoosick Falls, other municipalities and regions in the state have discovered contamination of drinking water supplies: Petersburgh, Newburgh, New Windsor, and several sites on Long Island. Most recently, drinking water in Watkins Glen, Montour Falls and Seneca County has been found to contain elevated levels PFAS chemicals when a grassroots group had the water tested independently, after failed attempts to request the data from the state.[30]

[30] Water questions arise after group's test. September 10, 2019. Observer-Review.com, http://www.observer-review.com/water-questions-arise-after-groups-test-cms-6546.

The bottom line is that New Yorkers deserve to know what's in their water, but the public will not know the extent of drinking water contamination until health-based MCLs are set and comprehensive testing is carried out throughout the state.

III. Review of MCLs Under Consideration by Other States

In 2009, the US Environmental Protection Agency (EPA) established provisional health advisories for PFOA at 400 parts per trillion (ppt) and for PFOS at 200 ppt based on science that was available on these chemicals at this time. In May 2016, the EPA released revised health advisories for PFOA and PFOS at 70 ppt because of new science that had emerged.[31] There are currently no federal health advisories for PFNA (perfluoroonanoic acid), PFHxS (perfluorohexanesulfonic acid), PFHpA (perfluoroheptanoic acid), PFBS (perfluorobutanesulfonic acid), GenX or any other PFAS chemicals. As science has continually emerged since 2016 on PFOA and PFOS, in addition to many other PFAS compounds in this class of 3,300-5,000 chemicals, the EPA has failed to keep up. As of now, there are no federal enforceable standards, or Maximum Contaminant Levels or MCLs, for any PFAS chemical.

In light of the toxicity of these chemicals and without strong leadership at the federal level, several states have begun to take action to regulate these chemicals in drinking water. The following represent some of the many actions that states have begun to take to set drinking water standards for PFAS chemicals:

> **California:** In 2018, California established notification levels at concentrations of 13 parts per trillion for PFOS and 14 parts per trillion for PFOA, while maintaining a response level of 70 ppt combined for PFOA and PFOS.[32]
>
> **Connecticut:** The state set a drinking water action for private wells in 2016 for PFOA and PFOS that is the same as the EPA health advisory of 70 ppt, but has since added three additional chemicals - PFNA, PFHxS and PFHpA - to the group. The sum of this group of five PFAS chemicals must be below the target concentration of 70 ppt.[33]
>
> **Massachusetts:** In January 2019, Massachusetts announced its intent to begin to establish MCLs for the sum of PFOA, PFOS, PFNA, PFHxS, PFHpA, PFDA at 20 ppt. The state has proposed groundwater cleanup standards for six PFAS compounds.[34]
>
> **Michigan:** In June 2019, a state scientific advisory panel recommended the following MCLs: PFNA at 6 ppt, PFOA at 8 ppt, PFOS at 16 ppt, PFHxS at 51 ppt, GenX at 370 ppt, PFBS at 420

[31] Drinking Water Health Advisories for PFOA and PFOS, US EPA, June 2016, www.epa.gov/sites/production/files/2016-06/documents/drinkingwaterhealthadvisories_pfoa_pfos_updated_5.31.16.pdf.
[32] Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS), California State Water Resources Control Council, July 2019, https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/PFOA_PFOS.html.
[33] Perfluoroalkyl Substances (PFAS) in Drinking Water: Health Concerns, October 2017, Connecticut Department of Public Health, https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/environmental_health/eoha/Toxicology_Risk_Assessment/2018-uploads/Perfluoroalkyl-Substances-PFASs-in-DWHealth-Concerns.pdf?la=en
[34] Massachusetts Proposes Cleanup Standards for PFAS, April 2019, National Law Review, https://www.natlawreview.com/article/massachusetts-proposes-cleanup-standards-pfas

ppt, and PFHxA at 400,000 ppt. Final MCLs are expected later in 2019.[35] If approved, the MCL for PFOA at 8 ppt would be the lowest to date in the nation.

Minnesota: In April 2019, the state issued new health-based values for two chemicals associated with groundwater contamination after reviewing the latest scientific data on the two chemicals. The new PFOS value of 15 parts per trillion (ppt) replaces the previous value of 27 ppt. The new health-based value for PFHxS is 47 ppt. Until now, the state had used the 27 ppt PFOS health-based value as a "surrogate" for PFHxS due to a lack of available data specific to PFHxS.[36]

New Hampshire: In June 2019, New Hampshire filed a final rulemaking proposal to establish Maximum Contaminant Levels (MCLs) and Ambient Groundwater Quality Standards (AGQS) for four PFAS chemicals: 12 ppt for PFOA, 15 ppt for PFOS, 18 ppt for PFHxS, and 11 ppt for PFNA.[37]

New Jersey: In 2018, New Jersey adopted an MCL and amended the Ground Water Quality Standard for PFNA to 13 parts per trillion. In 2017, the New Jersey Department of Environmental Protection (NJDEP) accepted a recommended MCL for PFOA of 14 ppt. In June 2018, the NJDEP accepted a recommended MCL for PFOS of 13 ppt.[38] The proposed rulemaking for PFOA and PFOS to establish these MCLs began on April 1, 2019 with a public hearing in May and public comments through May 31, 2019.[39]

North Carolina: In 2018, the state set a non-regulatory, non-enforceable health goal of 140 parts per trillion for GenX in drinking water, following extensive contamination by GenX in the Cape Fear River.[40]

Vermont: Vermont's health advisory level for the sum of five PFAS is set at 20 ppt in drinking water. The five PFAS chemicals are: PFOA, PFOS, PFHxS (perfluorohexane sulfonic acid), PFHpA (perfluoroheptanoic acid), PFNA (perfluorononanoic acid).[41] In May 2019, the Governor signed a law requiring all public water systems to test for these chemicals to ensure they do not exceed these levels and treat systems that do, in addition to requiring the state's Secretary for Natural Resources to issue a final proposed rule establishing an MCL for the five chemicals.[42]

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[35] Michigan eyes toughest limits for some PFAS in drinking water, Updated July 2019, Michigan Live, https://www.mlive.com/news/2019/06/michigan-eyes-toughest-limits-for-some-pfas-in-drinking-water.html.
[36] Perfluoroalkyl Substances (PFAS), Minnesota Department of Health, https://www.health.state.mn.us/communities/environment/hazardous/topics/pfcs.html#guidancerelease
[37] Press Release: NHDES Proposes New PFAS Drinking Water Standards, Final Rulemaking Proposal for PFOA, PFOS, PFHxS and PFNA, June 2019, New Hampshire Department of Environmental Services, https://www.des.nh.gov/media/pr/2019/20190628-pfas-standards.htm.
[38] Contaminants of Emerging Concern, New Jersey Department of Environmental Protection, https://www.nj.gov/dep/srp/emerging-contaminants/.
[39] NJDEP Proposed Rulemaking: MCLs, GWQS, and Related Rules for PFOA and PFOS, April 1, 2019, New Jersey Department of Environmental Protection, https://www.nj.gov/dep/srp/srra/listserv_archives/2019/20190401_srra.html
[40] GenX Health Information, 2017, North Carolina Department of Environmental Quality, https://files.nc.gov/ncdeq/GenX/GenX%20factsheet%20FINAL%2013Sep2017.pdf
[41] Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) in Drinking Water, Vermont Department of Health, https://www.healthvermont.gov/environment/drinking-water/perfluoroalkyl-and-polyfluoroalkyl-substances-pfas-drinking-water
[42] Vermont Governor Signs Law Setting Strict PFAS Limits, May 2019, National Law Review, https://www.natlawreview.com/article/vermont-governor-signs-law-setting-strict-pfas-limits.

From the above efforts by states to establish drinking water standards, there are some obvious conclusions to draw: First, scientific data has changed over time, increasingly demonstrating a need for stricter drinking water standards for these chemicals and oftentimes causing agencies to rethink their established levels to be more protective of human health. A better approach is a precautionary one, starting at the most protective levels based on all available science. Second, there is a growing list of PFAS chemicals, which can be substituted for PFAS chemicals that are phased out by industry, so any future regulations need to encompass a combined MCL that includes as many PFAS chemicals as possible. Third, with a lack of federal leadership, individual states are taking varying piecemeal approaches to try to regulate these dangerous chemicals in drinking water, resulting in inequitable protections across the United States. While there is a need for New York to take a strong leadership position and serve as a model in regulating the PFAS class of chemicals, this does not eliminate the need for even stronger leadership by the federal government to control a growing, nationwide drinking water crisis.

IV. Our Recommendations

Based on the above information, we have the following recommendations:

- **We urge the Department of Health to establish a combined MCL of 2 ppt for PFOA and PFOS.**

In December 2018, the New York State Drinking Water Quality Council recommended an MCL of 10 ppt for PFOA and an MCL of 10 ppt for PFOS. However, since that time, newly-released scientific evidence and modeling has expanded our understanding of the human health risks of extremely low levels of PFOA and PFOS exposure. The science is clearer than ever that there is likely no safe level of PFOA or PFOS in drinking water. The Department of Health must therefore revise and lower the Drinking Water Quality Council's recommendations in its final rulemaking decision.

A combined MCL must be in line with the most recent science and be set at the lowest level that is detectable and treatable. Developing an MCL is a complex process. First, a 'most sensitive endpoint,' the health effect that occurs at the lowest level of exposure, is identified. Second, 'uncertainty factors' are applied to account for database gaps and potential differences between animal and human exposure results. Third, exposure assumptions are made, such as drinking water intake rate, body weight and relative source contribution from drinking water (versus from food, consumer products, etc.). Finally, adjustments are made to take into consideration whether existing technology can detect and treat the contaminant at the desired level.

With each step in the MCL development process, critical assumptions are made that determine how health-protective the resulting standard is. In this section, we detail how recent science supports parameters that produce an MCL at the lowest level detectable and treatable for PFOA and PFOS.

In March 2019, the Natural Resources Defense Council (NRDC) produced a landmark report examining the latest science on PFAS chemicals. This report included detailed assessments of the human health impacts of PFOA and PFOS and extrapolated the necessary drinking water standards to protect the most

vulnerable populations.[43] This report has been provided to regulators in Michigan and New Jersey along with localized data for each state.[44] We strongly support many of the scientific conclusions in NRDC's report:

- *We urge the Department of Health to use delayed mammary gland development as the most sensitive endpoint for PFOA.* Delayed mammary gland development can result in difficulty in breastfeeding and an increase in susceptibility to breast cancer.[45] Both animal and human studies have linked PFOA exposure to delayed mammary gland development.[46] [47] New Jersey's Drinking Water Quality Institute has acknowledged that delayed mammary gland development is an adverse health effect associated with PFOA.[48] Though the Institute developed a PFOA reference dose using delayed mammary gland development as the most sensitive endpoint, they did not use it to calculate their MCL for PFOA. According to NRDC, "if New Jersey's reference dose for mammary gland development had been used, New Jersey's MCLG for PFOA would be less than one ppt."[49] PFOA's effects on mammary gland development confirms that there is likely no safe level of PFOA in drinking water.

  We are concerned that the Department of Health's Notice of Proposed Rulemaking did not mention delayed mammary gland development as an adverse health effect of PFOA. We urge the Department of Health to rectify this in the final rulemaking decision. A lack of precedent for using delayed mammary gland development as a most sensitive endpoint in the MCL development process should not deter the Department of Health from following the large body of scientific evidence confirming the deleterious health effects of extremely low levels of PFOA exposure.

- *We urge the Department of Health to use immune system toxicity as the most sensitive endpoint for PFOS.* The National Toxicology Program conducted a systematic review to evaluate immunotoxicity data on PFOA and PFOS in 2016, associating exposure with decreased antibody response to vaccines in humans, decreased host resistance to viruses, and suppressed immune response to antigens in animals.[50] New Jersey and Michigan both used immunotoxicity as the most sensitive endpoint for PFOS when developing their MCL proposals.

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[43] Anna Reade, et al. Scientific and Policy Assessment for Addressing Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water. Natural Resources Defense Council, March 15, 2019.
[44] Kimberly Ong. Re: Proposed Maximum Contaminant Level for Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS), DEP Dkt. No. 02-19-03. Natural Resources Defense Council, May 31, 2019.
[45] Ruthann Rudel, et al., Environmental Exposures and Mammary Gland Development: State of the Science, Public Health Implications, and Research Recommendations, 119 ENVIRON. HEALTH PERSPECT. 1053 (2011).
[46] Macon MB, et al., 2011. Prenatal perfluoroocyanoic acid exposure in CD-1 mice: low dose developmental effects and internal dosimetry. Toxicol Sci 122(1):131-145; White SS, et al., 2011. Gestational and chronic low-dose PFOA exposures and mammary gland growth and differentiation in three generations of CD-1 mice. Environ Health Perspect 119(8):1070-1076; Tucker DK, et al., 2015. The mammary gland is a sensitive pubertal target in CD-1 and C57Bl/6 mice following perinatal perfluorooctanoic acid (PFOA) exposure. Reprod Toxicol 54:26-36;
[47] Chunyuan Fei, et al., Maternal Concentrations of Perfluorooctanesulfonate (PFOS) and Perfluorooctanoate (PFOA) and Duration of Breastfeeding, 36 SCAND. J. WORK ENVIRON. HEALTH 413 (2010); M. E. Romano, et al., Maternal Serum Perfluoroalkyl Substances During Pregnancy and Duration of Breastfeeding, 149 ENVIRON. RES. 239 (2016); C. A. Timmermann, et al., Shorter Duration of Breastfeeding at Elevated Exposures to Perfluoroalkyl Substances, 68 REPROD. TOXICOL.164 (2017).
[48] New Jersey Drinking Water Quality Institute, "Maximum Contaminant Level Recommendation for Perfluorooctanoic Acid in Drinking Water: Basis and Background," March 15, 2017.
[49] Kimberly Ong. Re: Proposed Maximum Contaminant Level for Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS), DEP Dkt. No. 02-19-03. Natural Resources Defense Council, May 31, 2019.
[50] U.S. Department of Health and Human Services, National Toxicology Program, Monograph on

- *We urge the Department of Health to use a relative source contribution (RSC) no greater than 20 percent for PFOA and PFOS.* The RSC is the percentage of a person's total exposure to PFOA or PFOS through drinking water. A low RSC is needed due to the wide variety of products containing PFOA and PFOS and the multiple sources of exposure present in our environment. PFOA and PFOS have been found in food packaging,[51] carpets,[52] dental floss,[53] and eels off the coast of Long Island.[54] The FDA has detected PFAS chemicals in fish, dairy, meat, produce, and chocolate cake.[55]

- *We urge the Department of Health to use infant-specific exposure parameters for both PFOA and PFOS.* Minnesota has developed a toxicokinetic model for infant exposure to PFOA and PFOS, peer-reviewed and published in the *Journal of Exposure Science & Environmental Epidemiology* on January 10, 2019.[56] Infants are one of the most sensitive population to chemical exposure due to their developing organs. Children exposed to PFOA or PFOS in utero have a greater blood serum concentrations than the general population upon birth due to prior placental transfer from the mother.[57] [58] [59] This risk compounds for breast-fed infants, since PFOA and PFOS becomes concentrated in the breast milk at higher levels than in drinking water.[60] [61] [62] Crucially, the study found that, "peak breastfed infant serum levels were 4.4-fold higher than in formula-fed infants, with both of these scenarios producing serum levels in excess of the adult steady-state level."[63]

  Now that new data has come to light on the high risk to infants from these chemicals, several states have responded by adjusting their regulatory thresholds for PFOA and PFOS. The New Hampshire Department of Environmental Services specifically cited the Minnesota study in its

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Immunotoxicity Associated with Exposure to Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) (2016), https://ntp.niehs.nih.gov/ntp/ohat/pfoa_pfos/pfoa_pfosmonograph_508.pdf.

[51] Laurel Schraider, et al. Fluorinated Compounds in U.S. Fast Food Packaging. Environ Sci Technol Lett. 2017; 4(3): 105–111.

[52] Courtney Columbus, PFAS detected in carpets from several U.S. manufacturers. E&E News. https://www.eenews.net/stories/1060109571. Accessed September 2, 2019.

[53] Boronow, K.E., J.G. Brody, L.A. Schaider, G.F. Peaslee, L. Havas, B.A. Cohn. 2019. "Serum concentrations of PFASs and exposure-related behaviors in African American and non-Hispanic white women." Journal of Exposure Science & Environmental Epidemiology. DOI: 10.1038/s41370-018-0109-y

[54] Joan Gralla. Warning on eating eels caught in Suffolk from health department. Newsday. https://www.newsday.com/news/health/eels-suffolk-contaminated-carcinogen-1.33679849. Accessed September 2, 2019.

[55] Food and Drug Administration. Analytical Results of Testing for PFAS in Foods. https://www.fda.gov/food/chemicals/and-polyfluoroalkyl-substances-pfas. Accessed September 2, 2019.

[56] Helen M. Goeden, et al., A Transgenerational Toxicokinetic Model and its Use in Derivation of Minnesota PFOA Water Guidance, 29 JOURNAL OF EXPOSURE SCIENCE & ENVIRONMENTAL EPIDEMIOLOGY 183 (2019), https://www.nature.com/articles/s41370-018-0110-5.

[57] Midasch O, Drexler H, Hart N, Beckmann MW, Angerer J. Transplacental exposure of neonates to perfluorooctanesulfonate and perfluorooctanoate: a pilot study. Int Arch Occup Environ Health. 2007;80:643–8.

[58] Beesoon S, Webster GM, Shoeib M, Harner T, Benskin JP, Martin JW. Isomer profiles of perfluorochemicals in matched maternal, cord, and house dust samples: manufacturing sources and transplacental transfer. Environ Health Perspect. 2011;119:1659–64.

[59] Lee Y, Kim M-K, Bae J, Yang J-H. Concentrations of perfluoroalkyl compounds in maternal and umbilical cord sera and birth outcomes in Korea. Chemosphere. 2013;90:1603–9.

[60] Cariou R, Veyrand B, Yamada A, Berrebi A, Zalko D, Durand S, et al. Perfluoroalkyl acid (PFAA) levels and profiles in breast milk, maternal and chord serum of French women and their newborns. Environ Int. 2015;84:71–81.

[61] Fromme H, Mosch C, Morovitz M, Alba-Alejandre I, Boehmer S, Kiranoglu M, et al. Pre- and postnatal exposure to perfluorinated compounds (PFCs). Environ Sci Technol. 2010;44:7123–9.

[62] Liu J, Li J, Liu Y, Chan HM, Zhao Y, Cai Z, et al. Comparison on gestation and lactation exposure of perfluorinated compounds for newborns. Environ Int. 2011;37:1206–12.

[63] Helen M. Goeden, et al., A Transgenerational Toxicokinetic Model and its Use in Derivation of Minnesota PFOA Water Guidance, 29 JOURNAL OF EXPOSURE SCIENCE & ENVIRONMENTAL EPIDEMIOLOGY 183 (2019), https://www.nature.com/articles/s41370-018-0110-5.

rationale for lowering its MCL recommendations to 12 ppt for PFOA and 15 ppt for PFOS in June 2019.[64] One month later, a joint legislative committee approved NH DES's revised MCLs.

In addition, the Minnesota study was used by the Michigan Science Advisory Workgroup to generate its MCL recommendations of 8 ppt for PFOA and 16 ppt for PFOS.[65] The PFOA MCL would be the lowest in the nation if adopted. The workgroup stated, "The traditional risk assessment approach using simple equations based on body weight, water intake rate and RSC [relative source contribution] to calculate drinking water HBVs [health-based values] is not adequate to address the bioaccumulative nature and known or presumed developmental toxicity of PFAS. These traditional equations do not consider the PFAS body-burden at birth or any transfer of maternal PFAS through breastmilk."[66]

However, Michigan's proposed and New Hampshire's adopted MCL regulations still do not go far enough to fully protect public health. Both states refused to use delayed mammary gland development as the most sensitive endpoint for PFOA, and utilized a high relative source contribution of 50 percent for both PFOA and PFOS.[67] [68] *NRDC states that if MCLs for PFOA and PFOS were based on the most sensitive endpoints, with infant specific exposure rates and an uncertainty factor to protect fetuses, infants and children, the MCL for PFOA would be 0.01 ppt and the MCL for PFOS would be 0.2 ppt.*[69] The most recent scientific evidence therefore again confirms that the Department of Health must set its own MCLs for PFOA and PFOS at the lowest levels detectable and treatable, at 2 ppt.

We further urge the Department of Health to consider recent data that links PFOA in drinking water to pancreatic cancer in rats. The data was presented in June 2019 by Dr. Linda Birnbaum, of the National Toxicology Program, at the 2019 National PFAS Conference at Northeastern University. According to Dr. Birnbaum, "If you use the pancreatic tumors in the rats in the NTP study to calculate what would really be a virtually safe dose, you're getting down at about .1 ppt. Well, that's really low. And that's only for one PFAS."[70] Furthermore, the study provides more evidence that PFAS exposure affected breast development, including impacts on the growth of the mammary gland and problems with lactation. This lends additional weight to the use of delayed mammary gland development as the most sensitive endpoint for PFOA, in addition to further confirmation that there is likely no safe level of PFAS in drinking water.

Dr. Birnbaum's study reinforces a key point when attempting to regulate emerging contaminants. The science on PFOA, PFOS, and many of the other 3,300-5,000 PFAS chemicals is constantly emerging. The more that we learn about the health effects of these chemicals, the more dangerous we realize they are, as

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[64] Annie Ropeik. N.H. Sharply Lowers Proposed PFAS Water Limits, Now Among Nation's Strictest. New Hampshire Public Radio, June 28, 2019.
[65] Jamie Dewitt, et al. Health-Based Drinking Water Value Recommendations for PFAS in Michigan. Michigan Science Advisory Workgroup, June 27, 2019.
[66] Ibid.
[67] Ibid.
[68] New Hampshire Department of Environmental Services. Summary of the Technical Background Report for the Proposed Maximum Contaminant Levels and Ambient Groundwater Quality Standards for PFOA, PFOS, PFNA and PFHxS. June 9, 2019.
[69] Kimberly Ong. Re: Proposed Maximum Contaminant Level for Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS), DEP Dkt. No. 02-19-03. Natural Resources Defense Council, May 31, 2019.
[70] Sharon Lerner, Teflon Toxin Safety Level Should Be 700 Times Lower Than Current EPA Guideline. The Intercept. June 18, 2019. https://theintercept.com/2019/06/18/pfoa-pfas-teflon-epa-limit/. Accessed September 2, 2019.

the recent link to pancreatic cancer demonstrates. It is therefore imperative that the Department of Health take a precautionary approach when setting MCLs for PFOA and PFOS.

Finally, we urge the Department of Health to take the full costs to human health of PFOA and PFOS exposure into the rulemaking calculus. While water systems will indeed face costs to install and maintain complex treatment systems, the economic and social costs that come with setting MCLs too high, including increased number of hospital visits, increased number of early deaths, and increased number of stigmatized contaminated communities, which often lose businesses, home values and residents, are both of greater importance and greater in magnitude. And as climate change affects the availability of freshwater resources worldwide, cleaning up our water supplies and protecting them from harmful chemicals is an important economic investment New York needs to make. The Department of Health's stated mission is the health of all New Yorkers, and that should be the highest priority in setting MCLs.

A 2018 study examined the economic costs of low birth weight (LBW) caused by PFOA exposure across the nation. The study found that the total cost of PFOA-attributable LBW for 2003 through 2014 was estimated at $13.7 billion.[71] It is important to keep in mind that this staggering figure represents merely one of the negative health outcomes of PFOA exposure. Untallied are the costs of testicular and kidney cancer, immunotoxicity, thyroid disease, and so many other illnesses.

The Nordic Council of Ministers recently expanded the scope of costs of PFAS exposure, looking at three distinct exposure scenarios and the value of life lost in each. The total annual health-related costs, for three different levels of exposure, was found to be at least EUR 2.8 to EUR 4.6 billion in the Nordic countries and EUR 52 to EUR 84 billion in the European Economic Area countries.[72]

[71] Julia Malits. Perfluorooctanoic acid and low birth weight: Estimates of US attributable burden and economic costs from 2003 through 2014. International Journal of Hygiene and Environmental Health
Volume 221, Issue 2, March 2018, Pages 269-275.
[72] Gretta Goldenman, et al. The Cost of Inaction: A socioeconomic analysis of environmental and health impacts linked to exposure to PFAS. Nordic Council of Ministers. 2019. http://norden.diva-portal.org/smash/get/diva2:1295959/FULLTEXT01.pdf. Accessed September 2, 2019.

A table detailing the Council's methodology, estimating annual health impact-related costs of exposure to PFAS, is found below:

Exposure level	"Exposed" population and source	Health endpoint	Nordic countries		All EEA countries	
			Population at risk	Annual costs	Population at risk	Annual costs
Occupational (high)	Workers at chemical production plants or manufacturing sites	Kidney cancer	n.a.	n.a.	84,000–273,000	EUR 12.7–41.4 million
Elevated (medium)	Communities near chemical plants, etc. with PFAS in drinking water	All-cause mortality	621,000	EUR 2.1– 2.4 billion	12.5 million	EUR 41–49 billion
		Low birth weight	8,843 births	136 births of low weight	156,344 births	3,354 births of low weight
		Infection	45,000 children	84,000 additional days of fever	785,000 children	1,500,000 additional days of fever
Background (low)	Adults in general population (exposed via consumer products, background levels)	Hypertension	10.3 million	EUR 0.7– 2.2 billion	207.8 million	EUR 10.7–35 billion
Totals			*Nordic countries*	*EUR 2.8–4.6 billion*	*All EEA countries*	*EUR 52–84 billion*

Source: Gretta Goldenman, et al. The Cost of Inaction: A socioeconomic analysis of environmental and health
impacts linked to exposure to PFAS. Nordic Council of Ministers. 2019. http://norden.diva-portal.org/smash/get/diva2:1295959/FULLTEXT01.pdf. Accessed September 2, 2019.

- **We urge the Department of Health to establish an MCL of 0.3 ppb for 1,4-dioxane.**

The EPA has classified 1,4-dioxane as "likely to be carcinogenic to humans" by all routes of exposure.[73] Studies have shown increased incidences of nasal cavity, liver and gall bladder tumors after exposure to 1,4-dioxane.[74] [75] [76] Recent science has linked high levels of 1,4-dioxane exposure to kidney damage in mice.[77] Massachusetts has a health advisory level for 1,4-dioxane of 0.3 ppb, and the Department of Health should adopt this level as an MCL to fully protect human health. Given the emerging science on this chemical, a precautionary approach must be taken when regulating 1,4-dioxane.

[73] Technical Factsheet - 1,4-dioxane. U.S. EPA. November 2017. https://www.epa.gov/sites/production/files/2014-03/documents/ffrro_factsheet_contaminant_14-dioxane_january2014_final.pdf. Accessed September 2, 2019.
[74] EPA. Integrated Risk Information System (IRIS). 2013. "1,4-Dioxane (CASRN 123-91-1)." cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?su bstance_nmbr=326
[75] Agency for Toxic Substances and Disease Registry (ATSDR). 2012. "Toxicological Profile for 1,4-Dioxane." www.atsdr.cdc.gov/toxprofiles/TP.asp?id=955&tid=199
[76] U.S. Department of Health and Human Services (DHHS). 2014. "Report on Carcinogens, Twelfth Edition." Public Health Service, National Toxicology Program. 13th Edition. ntp.niehs.nih.gov/ntp/roc/content/profiles/dioxane. pdf
[77] Jingfan Qiu, et al. 1,4-Dioxane exposure induces kidney damage in mice by perturbing specific renal metabolic pathways: An integrated omics insight into the underlying mechanisms. Chemosphere
Volume 228, August 2019, Pages 149-158.

- **We urge the Department of Health to establish MCL(s) for additional PFAS chemicals.**

While establishing strong MCLs for PFOA, PFOS, and 1,4-dioxane is an important step, there are thousands of chemicals in the PFAS class that need to be better understood, monitored, and regulated in order to fully protect our drinking water and human health. In existence since the mid-20th century, some PFAS chemicals such as PFOS and PFOA were phased out in the United States beginning in the early 2000s, but have been replaced by shorter chain PFAS chemicals.[78] PFOA and PFOS are, in fact, no longer manufactured in or imported into the United States.[79] Shorter chain PFAS chemicals pose similar health risks, however, with the chemicals most studied being PFOA, PFOS, PFNA, and PFHxS.[80]

The Agency for Toxic Substances and Disease Registry (ATSDR) published a draft *Toxicological Profile for Perfluoroalkyls* in June 2018, which included fourteen perfluoroalkyl compounds that appeared in previous serum samples and monitoring studies. These fourteen chemicals include: perfluorobutyric acid (PFBA), perfluorohexanoic acid (PFHxA), perfluoroheptanoic acid (PFHpA), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA),perfluorodecanoic acid (PFDeA), perfluoroundecanoic acid (PFUA), perfluorobutane sulfonic acid (PFBuS), perfluorohexane sulfonic acid (PFHxS), perfluorooctane sulfonic acid (PFOS), perfluorododecanoic acid (PFDoA), perfluorooctane sulfonamide (PFOSA), 2-(N-Methyl-perfluorooctane sulfonamide) acetic acid (Me-PFOSA-AcOH), and 2-(N-Ethyl-perfluorooctane sulfonamide) acetic acid (Et-PFOSA-AcOH). This assessment concluded that there is an association with certain health effects and exposure to these fourteen PFAS chemicals, and that the data supports establishing minimum risk levels for PFOA, PFOS, PFNA, and PFHxS.[81]

The EPA's UCMR-3 monitored for six PFAS chemicals in public drinking water systems: perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), perfluorobutanesulfonic acid (PFBS). Individual states are also beginning to regulate these six chemicals, in addition to others such as GenX (North Carolina, Michigan) and PFDA (Massachusetts). States, in some cases, have addressed multiple PFAS chemicals with their drinking water standards: four (New Hampshire), five (Vermont, Connecticut), six (Massachusetts), and seven (Michigan).

As mentioned previously, the 2019 NRDC report suggests that a combined MCL of 2 ppt is feasible for PFOA, PFOS, PFNA, and PFHxS.[82] Based on all available science, we do not believe regulating just two PFAS chemicals in New York goes far enough, when the dangers of the larger class of these chemicals is quite clear.

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[78] History and Use of Per- and Polyfluoroalkyl Substances (PFAS), 2017, Interstate Technology Regulatory Council, https://pfas-1.itrcweb.org/wp-content/uploads/2017/11/pfas_fact_sheet_history_and_use_11_13_17.pdf

[79] *Toxicological Profile for Perfluoroalkyls: Draft for Public Comment*, June 2018, ATSDR, https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf

[80] NRDC Michigan report

[81] *Toxicological Profile for Perfluoroalkyls: Draft for Public Comment*, June 2018, ATSDR, https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf

[82] Anna Reade, Ph.D., "Scientific and Policy Assessment for Addressing Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water," April 2019, https://www.nrdc.org/resources/michigan-pfas-2019-scientific-and-policy-assessment-addressing-pfas-chemicals-drinking

- **We urge the Department of Health to reject the phased-in testing schedule outlined in the Notice of Proposed Rulemaking.**

In the Notice of Proposed Rulemaking, "the start of initial sampling is proposed to be staggered, requiring large systems to test first (within 60 days of adoption) and providing more time for smaller systems such that water systems serving between 3,300 to 10,000 persons should sample within 90 days of adoption and water systems serving less than 3,300 persons must begin sampling within 6 months of adoption."[83] There is simply no reason to delay testing for PFOA, PFOS, or 1,4-dioxane any longer. Large systems in New York have already conducted this testing under UCMR-3, so the testing is not new. Additionally, it has now been more than three years since the water crisis in Hoosick Falls came to light, and yet New Yorkers served by small water systems still do not know if elevated levels of these chemicals are impacting their drinking water.

Testing is especially urgent given the Department of Health's own sampling data showing 127 water systems exceeding 2 ppt of PFOA in its source water, 100 systems exceeding 2 ppt of PFOS, and 31 systems exceeding 0.35 ppb for 1,4-dioxane.[84] We know that contamination is present across the state. We do not believe New Yorkers should be exposed to contaminated water for another six months, especially in light of the extreme health risks of low levels of exposure detailed in this letter.

Furthermore, water systems have known for years that they would eventually be required to test for PFOA and PFOS. The Emerging Contaminant Monitoring Act passed by the New York State Legislature and signed into law by Governor Cuomo in 2017 specifically listed PFOA, PFOS, and 1,4-dioxane as contaminants that must be tested for by water systems of all sizes across the state. With several years to prepare, all water systems should be ready to conduct this testing within 60 days.

- **We urge the Department of Health not to use previous tests for PFOA, PFOS, and 1,4-dioxane for initial baseline testing requirements.**

It will be important for all water systems to test following the adoption of MCLs in order to establish a baseline of data across the state. Additionally, while these contaminants may not have been detected in a community previously, there is always the possibility of pollution migration. PFOA, PFOS, and 1,4-dioxane are particularly dangerous because they are persistent in the environment and do not readily biodegrade. Additionally, previous results for PFOA, PFOS, and 1,4-dioxane may have been established up to seven years ago, as early as 2012, when UCMR-3 testing began. Old results may no longer be relevant.

Given the widespread use of these contaminants, their ease in migrating in water, and the need for statewide data, all systems should begin testing to establish a baseline result, and repeat testing once MCLs are established.

[83] New York State Department of Health, Amendment of Subpart 5-1 of Title 10 NYCRR (Maximum Contaminant Levels (MCLs), https://regs.health.ny.gov/sites/default/files/proposed-regulations/Maximum%20Contaminant%20Levels%20%28MCLs%29.pdf
[84] Ibid.

V. Conclusion

The EPA has not established a drinking water standard for any contaminant in decades and does not appear likely to do so with PFAS chemicals or 1,4-dioxane, despite evidence showing a growing water crisis across the country. In the meantime, the piecemeal approach being taken up at the state level is the best defense we have against these toxic chemicals in our drinking water. This is a moment when New York State clearly needs to step up to protect public health, ensure clean drinking water for all of its residents, and lead the way decisively for other states to follow.

In closing, we wish to underscore the importance of New York State establishing stringent MCLs for PFOA, PFOS, other PFAS chemicals, and 1,4-dioxane. Millions of New Yorkers have already been exposed to these contaminants, and other New Yorkers are still exposed and may not even know it. In the interest of public health and safety and to establish a foundation of trust in our public water supplies, we urge the state to adopt a precautionary approach in finalizing the rulemaking for these MCLs. New York State must err on the side of caution and adopt standards that reflect the most recent science, which indicates that there is likely no safe level of exposure to these chemicals in drinking water.

We thank you for your consideration of our comments, and for your time and attention to ensuring clean drinking water for all New Yorkers.

Sincerely,

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