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For a thriving New England

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Raul Pino, M.D., M.P.H, Commissioner
Connecticut Department of Public Health
410 Capitol Avenue, MS #11EOH
Hartford, Connecticut 06106

Subject: Petition for Rulemaking to Establish a Treatment Technique Drinking Water Standard for Per- and Polyfluoroalkyl Substances

Dear Commissioner Pino:

Conservation Law Foundation (CLF) and Toxics Action Center hereby petition the State of Connecticut's Department of Public Health (DPH) to establish a drinking water standard for Per- and Polyfluoroalkyl Substances (PFAS) that is protective of public health.[1] Specifically, CLF and Toxics Action Center petition the DPH to adopt a treatment technique drinking water standard for the PFAS class of chemicals in lieu of setting a maximum contaminant level (MCL) for specific PFAS. At a bare minimum, if the DPH does not promulgate a treatment technique standard, the DPH should adopt an MCL for the PFAS class or MCLs for each PFAS chemical that poses a risk to public water systems in Connecticut. As an interim step to protect public health, the DPH should immediately adopt the Vermont Department of Public Health's Health Advisory for PFAS (PFAS Health Advisory) of 20 parts per trillion (ppt) for the PFAS Class as an MCL.[2]

PFAS have been found in drinking water sources across Connecticut and numerous studies have linked PFAS to significant health risks, including cancer. Although the State of Connecticut has taken preliminary steps to limit exposure to this dangerous class of chemicals, the DPH must take additional affirmative steps to protect Connecticut residents from PFAS.

CLF protects New England's environment for the benefit of all people. Founded in 1966, CLF is a non-profit, member-supported organization with offices located in Massachusetts, Vermont,

[1] Pursuant to Connecticut's Uniform Administrative Procedure Act "[a]ny interested person may petition an agency requesting the adoption, amendment or repeal of any regulation." Conn. Gen. Stat. Ann. § 4-174. The DPH has prescribed the procedure for such a petition in Conn. Agencies Regs. 19a-9-13.
[2] Although this petition has prioritized a drinking water standard for the PFAS class, there is also an urgent need to develop comprehensive standards for PFAS compounds, including but not limited to, surface water quality standards, pre-treatment standards for industrial users, and limits for land application of sludges.

Rhode Island, Maine, and New Hampshire. CLF uses the law, science, and the market to create solutions that protect public health, preserve natural resources, build healthy communities, and sustain a vibrant economy. CLF has been a leading advocate for clean water and safe drinking water throughout New England, and is engaged in numerous efforts to address the threat of emerging contaminants like PFAS throughout New England.

Founded in 1987, Toxics Action Center works side-by-side with communities across New England to clean up and prevent pollution at the local level.

Introduction

The DPH must immediately adopt a drinking water standard that protects the residents of Connecticut from exposure to all PFAS compounds. PFAS are persistent in the environment; bioaccumulative; highly mobile in water; found in hundreds of different products; and are toxic in very small concentrations. PFAS have been found at unsafe levels in drinking water in Connecticut, as well as in groundwater. Drinking water contaminated with PFAS is a significant source of exposure.[3] Without a drinking water standard, public water systems in Connecticut are not required to regularly monitor for PFAS compounds or to treat water with unsafe levels of PFAS.[4]

DuPont, 3M, and other chemical manufacturers recklessly produced these dangerous chemicals for decades despite being aware of the significant health risks associated with PFAS. Furthermore, in 1981, 3M and DuPont were aware that ingestion of perfluorooctanoic acid (PFOA) caused birth defects in rats.[5] After receiving this information, DuPont tested seven children of pregnant workers: two had birth defects.[6] DuPont was also aware that at least one facility had contaminated local drinking water supplies with unsafe levels of PFOA by 1987, but failed to warn anyone.

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[3] *See* Connecticut Department of Health, Perfluoroalkyl Substances (PFAS) in Drinking Water: Health Concerns (October 2017), https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/environmental_health/private_wells/2018-Downloads/032818-PFASs-in-DWHealth-Concerns-New-Phone.pdf.

[4] Connecticut Dept. of Public Health, *Drinking Water Section Update for Public Water Systems regarding Per- and Polyfluoroalkyl Substances (PFAS)*, September 27, 2018, https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/drinking_water/pdf/DWS-Circular-Letter-2018-19-PFAS-UPDATE.pdf, (We are aware that the DPH's Drinking Water Section is "recommending actions based upon the DPH DWAL using the Commissioners authority granted under Connecticut General Statutes section 22a-471," however this recommendation is limited to a case-by-case enforcement and voluntary sampling and does not properly protect Connecticut residents from the dangers posed by the presence of PFAS in drinking water sources).

[5] Nathaniel Rich, *The Lawyer Who Became DuPont's Worst Nightmare*, N.Y. TIMES, Jan. 6, 2016, https://www.nytimes.com/2016/01/10/magazine/the-lawyer-who-became-duponts-worst-nightmare.html.

[6] *Id.*

DuPont hid this vital health information from the public and the U.S. Environmental Protection Agency (EPA) while making billions of dollars in profits from continued production of PFOA.[7] Ultimately, DuPont was fined $16.5 million dollars in 2005 for failing to disclose information about toxicity and health risks cause by PFOA.[8] Although PFOA and perfluoro-octane sulfonic acid (PFOS) have now been phased out of production in the U.S.,[9] these compounds will remain in our drinking water, ground- and surface waters, as well as our bodies, for decades. In addition, manufacturers have rushed to produce thousands of alternative PFAS that are likely to pose similar health risks given the similarities in chemical structure.[10] There are now over 3,000 different kinds of PFAS.

To make matters worse, EPA has failed to take meaningful action to protect the public from exposure to PFAS in drinking water. After becoming aware of contamination of drinking water supplies and the significant health risks posed by these dangerous chemicals, EPA gave manufacturers almost a decade to phase out production and use of PFOA and PFOS through a voluntary program.[11] Despite learning in 2015 that millions of Americans were, and continue to be, exposed to PFAS contaminated drinking water, EPA has not taken steps toward requiring public water systems to regularly monitor for PFAS and to treat unsafe water.[12] EPA even suppressed a scientific study suggesting that EPA's current health advisory for PFOA and PFOS does not protect public health. After

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[7] *Id.*

[8] Memorandum from Grant Y. Nakayama, Assistant Administrator, to Environmental Appeals Board Re Consent Agreement and Final Order to Resolve DuPont's Alleged Failure to Submit Substantial Risk Information Under the Toxic Substances Control Act (TSCA) and Failure to Submit Data Requested Under the Resource Conservation and Recovery Act (RCRA) 3 (Dec. 14, 2005), https://www.epa.gov/sites/production/files/2013-08/documents/eabmemodupontpfoasettlement121405.pdf.

[9] U.S. Envtl. Prot. Agency, *Assessing and Managing Chemicals Under TSCA, Fact Sheet: 2010/2015 PFOA Stewardship Program*, https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/fact-sheet-20102015-pfoa-stewardship-program#what.

[10] *See, e.g.*, Stephen Brendel et al., *Short-Chain Perfluoroalkyl Acids: Environmental Concerns and a Regulatory Strategy under REACH* 30 ENVTL. SCI. EUR. 9, (2018), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5834591/pdf/12302_2018_Article_134.pdf.

[11] *See, e.g.*, U.S. Env't Prot. Agency, *In the matter of: Premanufacture Notice Numbers: Dupont Company* (April 9, 2009), https://assets.documentcloud.org/documents/2746607/Sanitized-Consent-Order-P08-0508-and-P08-0509.pdf.; Premanufacture Notification Exemption for Polymers; Amendment of Polymer Exemption Rule to Exclude Certain Perfluorinated Polymers, 75 Fed. Reg. 4295, 4296 (Jan. 27, 2010).

[12] David Andrews, *Report: Up to 110 Million Americans Could Have PFAS-Contaminated Drinking Water*, ENVTL WORKING GROUP, May 22, 2018, https://www.ewg.org/research/report-110-million-americans-could-have-pfas-contaminated-drinking-water#.W6_7a2hKg2w.

widespread public outcry, EPA announced the possibility of setting drinking water standards for just two out of more than 3,000 PFAS, but no enforceable regulatory standard has even been proposed to date, and even this limited action will take years.[13]

In addition, the federal government's capacity to set a standard protective health has been compromised by the staggering liabilities of the United States for releases of PFAS at federal facilities nationwide.

Connecticut can—and must—take the lead in the absence of federal safeguards. We will never be able to reverse the damage caused by chemical manufacturers and EPA's inaction, but the DPH has broad authority to promulgate rules that limit additional exposure to unsafe levels of PFAS in drinking water.[14] In the absence of such rules, the public will remain at risk, and the most vulnerable among us – nursing infants and children generally, who consume higher volumes of water for their body weight and have greater developmental susceptibility – will be at the greatest risk.

Moreover, in the absence of such rules, homeowners on well-water and municipalities and other drinking water system operators will be stymied in their efforts to recover the costs of adopting filtration and other safeguards from responsible polluters.

For all of these reasons, DPH should stop putting public health at risk and adopt a treatment technique drinking water standard that will protect Connecticut residents from the class of PFAS. As an interim step, the DPH should immediately adopt Vermont's PFAS Health Advisory as a drinking water standard for public water systems.

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[13] *The Federal Role in the Toxic PFAS Chemical Crisis, Hearing on SD-342 Before the Subcomm. on Homeland Security & Governmental Affairs*, 115th Cong. (2018) (statement of Chairman Rand Paul and Ranking Member Gary C. Peters), https://www.hsgac.senate.gov/hearings/the-federal-role-in-the-toxic-pfas-chemical-crisis.

[14] *See* Conn. Gen. Stat. Ann. § 25-32(a). ("The [DPH] shall have jurisdiction over all matters concerning the purity and adequacy of any water supply source used by any municipality, public institution or water company for obtaining water, the safety of any distributing plant and system for public health purposes, the adequacy of methods used to assure water purity, and such other matters relating to the construction and operation of such distributing plant and system as may affect public health."). *See also* Conn. Gen. Stat. Ann. § 25-32(h). ("The [DPH] commissioner shall adopt and from time to time may amend . . . (1) Physical, chemical, radiological and microbiological standards for the quality of public drinking water; (2) minimum treatment methods . . . required for all sources of drinking water . . .; (3) minimum standards to assure the long-term purity and adequacy of the public drinking water supply to all residents of this state; and (4) classifications of water treatment plants and water distribution systems which treat or supply water used or intended for use by the public.").

I. BACKGROUND

A. PFAS are harmful to human health.

PFAS are a public health crisis "perfect storm" because PFAS compounds are extremely persistent in the environment, highly mobile in water, bioaccumulative, toxic in very small quantities, and found in hundreds of products. PFAS compounds are man-made substances that do not occur naturally, and they have been used in non-stick cookware, water-repellent clothing, stain resistant fabrics and carpets, cosmetics, firefighting foams, and other products that resist grease, water, and oil.[15] These chemicals are extremely strong and highly resistant to degradation.[16]

PFAS are toxic to humans in very small concentrations—in the *parts per trillion*.[17] PFAS are suspected carcinogens and have been linked to growth, learning and behavioral problems in infants and children; fertility and pregnancy problems, including pre-eclamsia; interference with natural human hormones; increased cholesterol; immune system problems; and interference with liver, thyroid, and pancreatic function.[18] PFAS have been linked to increases in testicular and kidney cancer in human adults.[19] The developing fetus and newborn babies are particularly sensitive to some PFAS.[20]

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[15] Seth Kerschner & Zachary Griefen, *Next Round of Water Contamination Suits May Involve CWA*, LAW 360, October 5, 2017, https://www.law360.com/articles/970995/next-round-of-water-contamination-suits-may-involve-cwa.

[16] New Jersey Dep't of Envtl. Prot., Division of Science, Research, and Envtl Health, *Investigation of Levels of Perfluorinated Compounds in New Jersey Fish, Surface Water, and Sediment*, June 18, 2018, https://www.nj.gov/dep/dsr/publications/Investigation%20of%20Levels%20of%20Perfluorinated%20Compounds%20in%20New%20Jersey%20Fish,%20Surface%20Water,%20and%20Sediment.pdf.

[17] Agency for Toxic Substances and Disease Registry, *Per- and Polyfluoroalkyl Substances (PFAS) and Your Health*, https://www.atsdr.cdc.gov/pfas/health-effects.html; Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls*, https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf, at 5–6.

[18] *Id.*

[19] *Id.* at 6; Vaughn Barry et al., *Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers among Adults Living Near a Chemical Plant*, 121 ENVTL. HEALTH PERSPECTIVES 11-12, 1313-18 (Nov.-Dec. 2013), https://ehp.niehs.nih.gov/wp-content/uploads/121/11-12/ehp.1306615.pdf.

[20] U.S. Envtl. Prot. Agency, *Drinking Water Health Advisory for Perfluorooctanoic Sulfonate (PFOS)*, (May 2016), https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf at 10.

Alarmingly, epidemiological studies identify the immune system as a target of PFAS toxicity. Some studies have found decreased antibody response to vaccines, and associations between blood serum PFAS levels and immune system hypersensitivity (asthma) and autoimmune disorders (ulcerative colitis).[21] There are no medical interventions that will remove PFAS from the body.[22]

PFAS are very resistant to breakdown, bioaccumulate, and easily migrate. Therefore PFAS "are extremely persistent in both the environment, especially in water, and the human body."[23] A study by the Centers for Disease Control and Prevention (CDC) found four PFAS (PFOS, PFOA, perfluorohexane sulfonic acid (PFHxS), and perfluorononanoic acid (PFNA)) in the serum of nearly all of the people tested, indicating widespread exposure in the U.S. population.[24] PFOA and PFOS were found in up to 99 percent of the U.S. general population between 1999 and 2012.[25] PFAS are found in human breast milk and umbilical cord blood.[26]

While a great deal of public attention has recently been paid to PFOA and PFOS, and the DPH has set a Drinking Water Action Level (DWAL) of 70 parts per trillion (ppt) for five PFAS compounds (PFOA, PFOS, perfluoroheptanoic acid (PFHpA), PFNA, PFHxS), when all or some of these occur together in drinking water,[27] EPA and other scientists have raised concerns that other chemicals in the PFAS class of compounds are similar in chemical structure and are likely to pose similar health risks.[28] For example, all PFAS share a strong carbon-flourine bond and

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[21] *Id.*, at 39.
[22] Vermont Dep't of Health, *Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) in Drinking Water*, http://www.healthvermont.gov/sites/default/files/documents/pdf/ENV_DW_PFAS.pdf.
[23] Connecticut Dept. of Public Health, *Per- and Polyfluoroalkyl Substances*, https://portal.ct.gov/DPH/Drinking-Water/DWS/Per--and-Polyfluoroalkyl-Substances
[24] Ctr. for Disease Control and Prevention, *Per- and Polyfluorinated Substances (PFAS) Factsheet* (Apr. 7, 2017), https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html.
[25] U.S. Envtl. Prot. Agency, *Drinking Water Health Advisory for Perflourooctanoic Acid (PFOA)* (May 2016) at 9, https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf.
[26] Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls*, *supra* note 17, at 3.
[27] Connecticut Dept. of Public Health, *Drinking Water Action Level for Perfluorinated Alkyl Substances (PFAS)*, December 12, 2016, https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/environmental_health/eoha/Toxicology_Risk_Assessment/DrinkingWaterActionLevelPerfluorinatedAlkylSubstances-PFAS.pdf?la=en.
[28] *See, e.g.*, U.S. Envtl. Prot. Agency, *supra* note 12 (stating that, with respect to "GenX" compounds (chemical substances intended to replace long-chain (C8) PFAS used in Teflon), "EPA has concerns that these PMN substances will persist in the environment, could bioaccumulate, and be toxic ("PBT") to people, wild mammals, and birds.").

"degrade very slowly, if at all, under environmental conditions."[29] Although some of the long-chain PFASs are being regulated or phased out, the most common replacements are short-chain PFASs with similar structures, or compounds with fluorinated segments joined by ether linkages.[30] While some shorter-chain fluorinated alternatives seem to be less bioaccumulative, they are still as environmentally persistent as long-chain substances or have persistent degradation products.[31] In addition, because some of the shorter-chain PFASs are less effective, larger quantities may be needed to provide the same performance.[32] Thus, drinking water rules must protect the public health from unsafe exposure to all compounds in the PFAS class.

B. PFAS have been found in Connecticut drinking water and groundwater.

Not only are PFAS toxic in very small amounts (in the nanograms per liter or parts per trillion), they are highly mobile in groundwater and drinking water sources, and have been found in waters throughout Connecticut.

1. Drinking Water

During a period from 2013-2015 the DPH participated in EPA's testing program under the Unregulated Contaminant Monitoring Rule (UCMR) to determine the extent of six PFAS compounds in Connecticut water systems.[33] None of the 29 large water systems (tested at 129 locations) showed detectible signs of PFAS contamination.[34] However, the DPH noted that they believe there may still be localized areas of contamination where chemicals would be more prevalent in groundwater, and possibly drinking water.[35]

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[29] Arlene Blum et al., The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs), ENVTL. HEALTH PERSPECTIVES, May 2015, https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.1509934.
[30] *Id. See also,* KEMI Swedish Chemicals Agency, *Occurrence and use of highly fluorinated substances and alternatives; Report from a government assignment,* 6-78, 26 (August 9, 2009), https://www.kemi.se/en/global/rapporter/2015/report-7-15-occurrence-and-use-of-highly-fluorinated-substances-and-alternatives.pdf.
[31] *Id.*
[32] *Id.*
[33] Connecticut Dept. of Public Health, *Perfluoroalkyl Substances (PFAS) in Drinking Water: Health Concerns*, (October 2017), https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/environmental_health/private_wells/2018-Downloads/032818-PFASs-in-DWHealth-Concerns-New-Phone.pdf
[34] *Id.*
[35] *Id.*

In 2016 the DPH set a DWAL equal to the EPA Health Advisory limit[36] for five PFAS compounds including PFNA, PFHxS, and PFHpA.[37] These PFAS must be below the target concentration of 70 ppt.[38]

In February and April of 2018, the New York Department of Heath Drinking Water division shared with the city of Greenwich, Connecticut their results regarding PFAS testing of well water in northwest Greenwich. A Connecticut statute authorizes the New York agency to investigate complaints of polluted public and private drinking wells that border both states. One of the wells tested was found to have PFAS at a level of 70 ppt.[39]

As a result of this PFAS contamination finding a separate study was conducted in April of 2018 in eight private wells throughout Greenwich, Connecticut.[40] Results showed PFAS contamination in two private wells.[41] The levels of PFAS found in these private wells exceeded the DWAL limits.[42] Notably, all contaminated wells in Greenwich were located near the Westchester County Airport, and investigators believe the PFAS contamination was caused by leached soil stemming from the airport property.[43] The Westchester County Airport was formerly home to the Air National Guard unit, who regularly used PFAS compounds in order to extinguish petroleum-based fires.[44]

2. Groundwater

In addition to the private drinking wells that have shown signs of PFAS contamination, there have been reports that the groundwater near the Westchester County Airport has also been affected.[45] Preliminary results from a monitoring well located near the Air National Guard septic field returned findings of PFAS concentrations of an astounding 990 ppt, more than 14 times the

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[36] *Id.*; U.S. Envtl Prot. Agency, Drinking Water Health Advisories for PFOA and PFOS, https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos
[37] Connecticut Dept. of Public Health, *supra* note 29.
[38] *Id.*
[39] Residents Ask Tough Questions on PFAS Contamination of Well Water, supra note 41.
[40] Robert Marchant, *Contaminated water found in Greenwich wells near airport*, GREENWICH TIME April 13, 2018, https://www.greenwichtime.com/local/article/Contaminated-water-found-in-Greenwich-wells-near-12832976.php.
[41] *Id.*
[42] *Residents Ask Tough Questions on PFAS Contamination of Well Water*, supra note 41.
[43] *Id.*
[44] *Id.*
[45] *Id.*; David McKay Wilson, Groundwater contamination found at Westchester County Airport, LOHUD USA TODAY, February 1, 2018, https://www.lohud.com/story/money/personal-finance/taxes/david-mckay-wilson/2018/02/01/groundwater-contamination-found-westchester-county-airport/1070586001/

Health Advisory limit set by the EPA and Connecticut's DWAL.[46] Investigations are still underway to determine whether this contamination is flowing toward the Keniscio Reservoir (which provides drinking water to New York City) or southeast (toward Greenwich public wells).[47]

Lastly, in discussions about PFAS with the Connecticut Department of Energy and Environmental Protection, agency officials have stated that they believe more contaminated sites exist but have yet to be found.

II. The DPH should establish a treatment technique drinking water standard for the PFAS class that is protective of human health.

In the absence of federal safeguards, Connecticut must act to protect drinking water and limit Connecticut residents' exposure to PFAS. As described below, setting MCLs on a chemical-by-chemical basis does not adequately protect the public from PFAS health impacts. Instead, a treatment technique drinking water standard for the class of PFAS is needed. This regulatory approach is authorized by law and technically feasible.

A. The chemical-by-chemical, MCL approach to regulating toxic chemicals is not protective of public health and the environment.

The current chemical-by-chemical regulatory framework for toxic chemicals is so inefficient it puts public health at risk. For example, even after the 2016 amendment to the Toxic Substances Control Act (TSCA), "it could take decades to evaluate the 80,000 chemicals already in commerce that have yet to be tested, let alone the 2,000 new chemicals introduced each year."[48] The EPA "still treats each chemical individually, continuing the saga in which similar, but slightly different, chemicals can be regrettably substituted."[49]

The "whack-a-mole" approach is especially troublesome when it comes to setting drinking water standards for emerging contaminants like PFAS, because it is time consuming and expensive to assess them, it is "technically and financially challenging to identify and reverse environmental and human exposure to PFASs[,]" and both of these issues are exacerbated by the continual introduction of new PFAS compounds.[50] There

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[46] *Id.*
[47] *Id.*
[48] Joseph Allen, *Stop playing whack-a-mole with hazardous chemicals*, WASH. POST, December 15, 2016, https://www.washingtonpost.com/opinions/stop-playing-whack-a-mole-with-hazardous-chemicals/2016/12/15/9a357090-bb36-11e6-91ee-1adddfe36cbestory.html?utm_term=.52a9c9f5b23c
[49] *Id.*
[50] Zhanyun Wang et al., *A Never-Ending story of Per- and Polyfluoroalkyl Substances (PFASs)*?, ENVTL SCIENCE & TECH., February 22, 2017, at 2511, https://pubs.acs.org/doi/pdf/10.1021/acs.est.6b04806.

are at least 3,000 PFAS compounds in use currently[51] and regulators don't know the names of all PFAS compounds, much less where they are located in their state. Recently developed PFAS are regarded as trade secrets and closely-guarded confidential business information, so manufacturers often do not apply for patents or supply regulators with information about molecular structure or usage.[52]

In light of the thousands of PFAS that have been introduced into commerce, and more introduced each year, establishing MCLs for each PFAS compound is simply not sustainable. The regulators fall farther behind every year, putting our citizens in harm's way. Thus, Connecticut should adopt a treatment technique drinking water standard that protects Connecticut residents from exposure to unsafe levels of all chemicals in the PFAS class.

B. The current DWAL for PFAS does not protect Connecticut residents.

Connecticut's current DWAL for PFAS does not protect Connecticut residents from exposure to unsafe PFAS levels in public water systems. Even though Connecticut has issued this DWAL, public water systems in Connecticut are not required to test for and treat unsafe concentrations of PFAS because there is no federal or state drinking water standard for any of the PFAS compounds.[53] In September 2018, the DHS's Drinking Water Section recognized that the 2013-15 data submitted to the EPA under the UCMR3 testing program "was not sufficient to evaluate the safety of [Connecticut's] public drinking water relative to the State's [DWAL]."[54] In response, the DHS's Drinking Water Section has put in place an evaluation process of Connecticut's water sources that will take at least two years to complete, without adopting any temporary MCL or establishing an alternative drinking water standard for PFAS. This means that Connecticut's public water systems will not be required to monitor for or treat unsafe concentrations of PFAS in the foreseeable future.[55] Furthermore, even if the DHS were to adopt

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[51] KEMI Swedish Chemicals Agency, *supra* note 30.
[52] Zhanyun Wang et al., *supra* note 50.
[53] We are aware of Connecticut's Drinking Water Section Circular Letter #2018-20 requiring "all [public water systems] that are required to produce a water supply plan [to] update their evaluation of source water protection measures." However, this initiative does not require public water systems to do PFAS sampling and only recommends public water systems to sample their water sources. *See* Connecticut Dept. of Public Health, *Requirement to Update an Evaluation of Source Water Protection Measures and Request to Sample Drinking Water Sources for Perfluoroalkyl Substances (PFAS)* (September 27, 2018), https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/drinking_water/pdf/DWS-Circular-Letter-2018-20-PFAS-Eval-WSP-Systems.pdf.
[54] *Id.*
[55] Only when developing new sources of public drinking water supply will Public Water Systems and applicants for a Certificate of Public Convenience and Necessity be required to sample for PFAS. *See*

the current DWAL as an MCL, this would not be protective of public health because it does not address the thousands of PFAS chemicals in the PFAS class.

C. A treatment technique drinking water standard is appropriate for PFAS.

The DPH has broad authority to regulate unsafe chemicals in drinking water.[56] In this case, the unique nature of PFAS demands an alternative approach to chemical-by-chemical regulation through MCLs. Regulation of PFAS as a class and through a treatment technique standard is necessary. There are well-established drinking water treatment technologies that public water systems can install to remove unsafe levels of PFAS from drinking water. There is simply no excuse for the DPH to delay the promulgation of a drinking water standard for the PFAS class to address this public health crisis "perfect storm."

1. The DPH has the authority to adopt a treatment technique drinking water standard.

The DPH has authority to adopt a treatment technique drinking water standard for PFAS. Pursuant to Conn. Gen. Laws Stat. Ann. § 25-32(h), the DPH commissioner "shall adopt and from time to time may amend [inter alia] . . . (1) [p]hysical, chemical, radiological and microbiological standards for the quality of public drinking water [and] (2) minimum treatment methods . . . required for all sources of drinking water."[57] Neither the statute nor the Connecticut Standards for Quality of Public Drinking Water expressly provided for how the DPH should establish water standards, but they recognize the DPH's broad authority to adopt "minimum standards to assure the long-term purity and adequacy of the public drinking water supply to all residents of [Connecticut]."[58]

"A treatment technique is an enforceable procedure or level of technological performance which public water systems must follow to ensure control of a contaminant."[59] Where a treatment technique is selected in lieu of an MCL, the treatment technique must "prevent known or anticipated adverse effects on the health of persons to the extent feasible."[60] EPA has adopted several treatment technique drinking water standards in lieu of an MCL where EPA has

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Drinking Water Section Update for Public Water Systems regarding Per- and Polyfluoroalkyl Substances (PFAS), *supra* note 4.

[56] *See* Conn. Gen. Stat. Ann. § 25-32.

[57] *Id.* The State of Connecticut has primacy for the Safe Drinking Water Act in Connecticut and has adopted the authority of the Safe Drinking Water Act via rulemaking. Connecticut Department of Public Health, *Standards for Quality of Public Drinking Water*, Regs. Conn. State Agencies § 19-13-B102.

[58] Conn. Gen. Stat. Ann. § 25-32(h).

[59] U.S. Envtl. Prot. Agency, *How EPA Regulates Drinking Water Contaminants*, https://www.epa.gov/dwregdev/how-epa-regulates-drinking-water-contaminants.

[60] 42 U.S.C. § 300g-1(b)(7)(A).

determined that it is "not economically or technologically feasible to ascertain the level of [a] contaminant."[61] For example, the Lead and Copper Rule requires the use of a treatment technique.[62] This rule requires public water systems to test drinking water in the homes of consumers and undertake additional treatment measures to control lead if 10% of the samples exceed 15 ppb.[63] The Surface Water Treatment Rule also requires the use of a treatment technique. Under this rule, most public water systems that obtain water from surface water or groundwater under the direct influence of surface water must use filters and disinfectants to reduce pathogens.[64] In both cases, EPA had to establish a unique procedure to address the risks posed by a specific contaminant because an MCL would not have been practical or protective of public health due to the unique characteristics of the contaminants.

Similarly, the unique characteristics of the PFAS class pose a public health threat that cannot be adequately addressed with the establishment of an MCL for one or a few PFAS chemicals. The DHP has the authority to develop a procedure that would require installation of specific drinking water treatment technologies under certain circumstances. The DHP has multiple options to protect Connecticut residents from exposure to the PFAS class. For example, the DHP could promulgate a rule that requires public water systems to install appropriate treatment technologies where (1) the sum of all measurable PFAS exceeds a conservative threshold level that is protective of public health and takes into account the cumulative impacts of all PFAS chemicals or (2) the presence of PFAS compounds is detected using "non-targeted" laboratory analysis.[65] Non-targeted analysis allows "researchers [to] rapidly characterize thousands of never studied chemical compounds in a wide variety of environmental, residential, and biological media.[66] An alternative option would be to require: 1) a robust source water assessment for PFAS and 2) treatment where PFAS may be present in the source water. The DPH should determine a specific procedure for the drinking water standard through a robust stakeholder process as part of the rulemaking process.

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[61] *Id.*
[62] U.S. Envtl. Prot. Agency, *How EPA Regulates Drinking Water Contaminants, supra* note 59.
[63] U.S. Envtl. Prot. Agency, *Lead and Copper Rule*, https://www.epa.gov/dwreginfo/lead-and-copper-rule.
[64] U.S. Envtl. Prot. Agency, *Surface Water Treatment Rules, https://www.epa.gov/dwreginfo/surface-water-treatment-rules.*
[65] U.S. Envtl. Prot. Agency, *EPA Researchers Use Innovative Approach to Find PFAS in the Environment*, https://www.epa.gov/sciencematters/epa-researchers-use-innovative-approach-find-pfas-environment.; Karl Leif Bates, *Duke Expert Helps Spearhead State's New Water-Testing Program*, DUKE TODAY, Aug. 8, 2018, https://today.duke.edu/2018/08/duke-expert-helps-spearhead-states-new-water-testing-program.
[66] *Id.*

2. Due to the unique characteristics of the PFAS class of compounds, a treatment technique is necessary to protect public health.

i. Regulation of PFAS chemicals as a class is necessary.

Even if the DPH were to adopt the current DWAL (or a lower ppt value) as an MCL, a combined limit for five PFAS would not protect Connecticut residents from the 3,000 or more other PFAS.[67]

First, while the 2013-15 monitoring for PFAS under EPA's UCMR3 testing program did not find significant levels of the six PFAS (PFOA, PFOS, PFNA, PFHxS, PFHpA, and PFBS), the DPH's Drinking Water Section recognized that "the experiences of other Northeastern states with PFAS contamination in groundwater" calls for a more cautious but swift action to protect drinking water sources in Connecticut. Even though testing did not raise issues with the six PFAS under EPA's UCMR3 testing program, there are likely many other PFAS in Connecticut that the State is simply not aware of yet given the speed and secrecy with which chemical manufacturers have introduced these dangerous chemicals into commerce.[68]

Second, as discussed above, PFAS are similar in chemical structure and some PFAS break down into each other. While long-chain PFAS compounds may be decreasing in the environment due to voluntary phase-outs by manufacturers, "the most common replacements are short-chain PFAS with similar structures."[69] Third, these PFAS chemicals are often found together, and fourth, they are likely to have similar health effects as discussed in Section I.A.

EPA has applied similar concepts to establish an MCL for a group of chemicals.[70] For example, EPA established an MCL for five haloacetic acid disinfection byproducts (HAA5) because it did not have sufficient information regarding (1) the occurrence of individual haloacetic acids; (2) how water quality parameters affect the formation of haloacetic acids; (3) how "treatment technologies control the formation of individual . . . [haloacetic acids]; and (4) toxicity information for some of the individual haloacetic acids.[71] In light of the unique challenges associated with regulation of these chemicals, EPA promulgated a group MCL even in the

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[67] *Occurrence and use of highly fluorinated substances and alternatives; Report from a government assignment*, *supra* note 31, at 6.
[68] Envtl. Working Group, Comments on the Agency for Toxic Substances and Disease Registry (ATSDR) Draft Toxicological Profile for Perfluoroalkyls, August 20, 2018, https://cdn.ewg.org/sites/default/files/testimony/EWG%20Comments%20for%20ATSDR_Aug20..pdf?_ga=2.236461961.949885036.1539136763-1789323056.1527870942.
[69] Blum et al., *supra* note 31.
[70] *Drinking Water Guidance, Grouping Process for Drinking Water Health Advisories*, *supra* note 87.
[71] 63 Fed. Reg. 69390, 69409 (Dec. 16, 1998), https://www.gpo.gov/fdsys/pkg/FR-1998-12-16/pdf/98-32887.pdf#page=1.

absence of complete information about each individual haloacetic acid in order to better protect public health.[72] For all these reasons, it is appropriate to regulate PFAS chemicals as a class.

ii. A treatment technique in lieu of an MCL is necessary.

A treatment technique in lieu of an MCL for specific PFAS chemicals or small groups of PFAS chemicals is necessary. As discussed previously, scientists suspect that PFAS chemicals in the class may have similar adverse health effects as the handful of PFAS compounds that have been studied more extensively.[73] EPA has only developed targeted test methods for 14 PFAS chemicals out of more than 3,000 compounds.[74] Thus, it is simply not economically or technically feasible to ascertain the level of each specific PFAS chemicals in the PFAS class that pose a risk to Connecticut residents.

As the DPH is well aware, establishing an MCL for one compound is resource intensive and time consuming. Adopting a treatment technique drinking water standard for the PFAS class in lieu of establishing MCLs for thousands of PFAS chemicals will require far fewer resources and will provide protection from exposure to unsafe levels of PFAS on a much shorter timeline. For these reasons, a treatment technique drinking water standard is necessary to protect Connecticut residents.

3. Treatment technologies are available to remove long- and short-chain PFAS.

There are both established and novel methods to remove and destroy PFAS. While long- and short-chain PFAS may be difficult to treat with any one traditional technology—some new technologies are in development—, a "treatment train" of several technologies combining adsorption, separation, and destruction in sequence, for example, would be effective in treating drinking water and protecting public health.

Adsorption technologies such as GAC and ion exchange "are currently the most commonly encountered interim response measures to achieve immediate compliance with drinking water

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[72] *Id.*
[73] KEMI Swedish Chemicals Agency, *supra* note 30.
[74] U.S. Envtl. Prot. Agency, *Method 537: Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography /Tandem Mass Spectrometry* 537-2 (EPA/600/R-08/092) (Sep. 2009), *https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NERL&dirEntryId=198984&simpleSearch=1&searchAll=EPA%2F600%2FR-08%2F092+*.

standards and serve as the benchmark of practicality and effectiveness for other treatment technologies."[75]

While new adsorption technologies like organically modified silica adsorbents show promise,[76] GAC has long been used for adsorption of chemical pollutants, consistently removes PFOS with an efficiency of more than 90 percent,[77] and is the treatment technique specified in Safe Drinking Water Act (SDWA) for the control of synthetic organic chemicals:

> granular activated carbon is feasible for the control of synthetic organic chemicals, and any technology, treatment technique, or other means found to be the best available for the control of synthetic organic chemicals must be at least as effective in controlling synthetic organic chemicals as granular activated carbon.[78]

Separation technologies, including reverse osmosis, microfiltration, ultrafiltration and nanofiltration, are highly effective for PFAS removal and can remove PFAS at more than 99% effectiveness.[79] "Membrane filtration has several benefits including: achieving continuous separation, low energy consumption, ease of combination with other existing techniques, easy up-scaling, and low chemical costs."[80] Ozofractionation (a patented process by the company EVOCRA and available commercially as Ozofractionative Catalyzed Reagent Addition (OCRA) (Dickson 2013, 2014)) is a novel separation technology that shows high (>99.99 percent reduction) effectiveness for PFAS.[81]

Finally, novel destructive treatment technologies for PFAS are becoming available. Destructive technologies include sonochemical decomposition,[82] chemical/advanced photochemical oxidation,[83] and AECOM's DE-FLUORO™ technology.[84]

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[75] J. Horst et al., *Water Treatment Technologies for PFAS: The Next Generation, 38* GROUNDWATER MONITORING AND REMEDIATION, No. 2 (Spring 2018), at 15.
[76] *Id.* at 15–16.
[77] K.H. Kucharzyk et al., *Novel treatment technologies for PFAS compounds: a critical review,* 204 JOURNAL OF ENVTL MANAGEMENT (2017), at 759; 42 U.S.C. § 300g-1(b)(4)(D), 759.
[78] 42 U.S.C. § 300g-1(b)(4)(D).
[79] Kucharzyk et al, *supra* note 82, at 759–60; Horst et al, *supra* note 80.
[80] V.A. Arias Espana et al., *Treatment technologies for aqueous perfluorooctanesulfonate (PFOS) and perfluorooctanoate (PFOA): A critical review with an emphasis on field testing,* 4 ENVIRONMENTAL TECHNOLOGY & INNOVATION (2015) 168, 177.
[81] Horst et al, at 17.
[82] Espana et al, *supra* note 85, at 760.
[83] *Id.*, at 178.
[84] AECOM, *AECOM's Promising New PFAS Treatment Technology DE-FLUORO Shows Complete Destruction of PFAS,* https://www.aecom.com/content/wp-content/uploads/2018/04/PFAS-Treatment-Technology-DE-FLUORO_INFO-SHEET.pdf.

This treatment train solution will also confer significant co-benefits for public health, because the same technologies that are effective in PFAS treatment are effective in removing a host of other dangerous chemicals. Granular activated carbon (GAC) adsorption filters alone, for example, are effective in removing dozens of harmful contaminants in addition to PFAS (including, but not limited to: RDX, arsenic, benzene, cryptosporidium, MTBE, mercury, perchlorate, tetrachloroethylene (Perc), and trichloroethylene (TCE)).[85] Other technologies that should be considered as components of the treatment train confer similar co-benefits; for example, membrane separation technologies like reverse osmosis not only treat PFAS but, without limitation, also treat 1,4-dioxane, alachlor, chromium, malathion, and nitrates.[86]

For all these reasons, CLF urges the DPH to initiate a rulemaking for a treatment technique drinking water standard for the PFAS class.

III. In the alternative, the DPH should either adopt an MCL for the PFAS class or for each individual PFAS chemical.

The DPH must take action to establish drinking water standards for PFAS in the absence of federal safeguards even if the DPH does not establish a treatment technique standard. As discussed in Section II, the DPH has the authority to regulate PFAS as a class or on a chemical-by-chemical basis. PFAS are present in Connecticut waters and are known to cause adverse health effects. Thus, at a bare minimum, the DPH should either 1) adopt an MCL for the PFAS class, or 2) set a schedule for the adoption of an MCL for each individual PFAS chemical that has been identified, and begin establishing MCLs immediately. Of course, as new PFAS chemicals are identified the schedule of MCL adoption should be modified.

IV. The DPH should immediately adopt Vermont's PFAS Health Advisory as a maximum contaminant level.

In the interim and until the DPH establishes a treatment technique drinking water standard for PFAS, the DPH should immediately adopt Vermont's PFAS Health Advisory of 20 ppt for the PFAS Class as an MCL.

CONCLUSION

For all the forgoing reasons, CLF petitions the DPH to establish a drinking water standard for PFAS that is protective of public health. Specifically, the DPH should adopt a treatment technique drinking water standard for the PFAS class. In the alternative, the DPH should establish an MCL for the PFAS class or individual MCLs for each PFAS chemical that poses a

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[85] U.S. Envtl. Prot. Agency, *Welcome to the Drinking Water Treatability Database, Granular Activated Carbon*, https://oaspub.epa.gov/tdb/pages/treatment/treatmentContaminant.do.
[86] *Id.*

risk to public water systems in Connecticut. As an interim step, the DPH should immediately adopt Vermont's PFAS Health Advisory of 20 ppt for the PFAS Class as an MCL.

The significant threats posed to human health and the environment by the PFAS class of compounds are clear. These compounds have been found in Connecticut drinking water and groundwater. The dangers this class of chemicals pose to Connecticut residents demand immediate action to limit further exposure. Thank you for your consideration.

Sincerely,

Heather A. Govern, Director
Conservation Law Foundation

Sylvia Broude, Executive Director
Toxics Action Center

CC:

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