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conservation law foundation

For a thriving New England

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October 25, 2018

The Honorable Martin Suuberg
Commissioner
Massachusetts Department of Environmental Protection
One Winter Street, 2nd Floor
Boston, MA 02108

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

Dear Commissioner Suuberg:

Conservation Law Foundation (CLF) and Toxics Action Center hereby petition the Massachusetts Department of Environmental Protection (MassDEP) 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 MassDEP 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.[2] At a bare minimum, if MassDEP does not promulgate a treatment technique standard, MassDEP should adopt an MCL for the PFAS class or MCLs for each PFAS chemical that poses a risk to public water systems in Massachusetts. As an interim step to protect public health, MassDEP 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.[3]

PFAS have been found in drinking water sources across Massachusetts and numerous studies have linked PFAS to significant health risks, including cancer. Although the Commonwealth of

[1] Pursuant to Massachusetts' Administrative Procedure Act, codified at Mass. Gen. Laws Ch. 30A, § 4, "[a]ny interested person may petition an agency requesting the adoption, amendment or repeal of any regulation, and may accompany his petition with such data, views and arguments as he [or she] thinks pertinent." MassDEP has prescribed the procedure for such a petition in 310 Mass. Code Regs. 2.00-2.09.

[2] We are aware that MassDEP is considering setting MCLs for some PFAS but still recommend the approach outlined in this petition.

[3] 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.

Massachusetts has taken preliminary steps to limit exposure to this dangerous class of chemicals, MassDEP must take additional affirmative steps to protect Massachusetts 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, 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 in Massachusetts and 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**

MassDEP must immediately adopt a drinking water standard that protects the residents of Massachusetts 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 Massachusetts, as well as in ground- and surface waters. Drinking water contaminated with PFAS is a significant source of exposure.[4] Without a drinking water standard, public water systems in Massachusetts are not required to regularly monitor for PFAS compounds or to treat water with unsafe levels of PFAS.

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.[7]

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[4] *See* Mass. Dep't of Envtl Prot., *Office of Research and Standards Final Recommendation for Interim Toxicity and Drinking Water Guidance Values for Perfluorinated Alkyl Substances Included in the Unregulated Chemical Monitoring Rule 3*, June 8, 2018, https://www.mass.gov/files/documents/2018/06/11/pfas-ors-ucmr3-recs_0.pdf (noting that "All of the UCMR 3 PFAS have been detected in one or more MA water supplies, as well as in some groundwater and surface water samples.").

[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.*

[7] *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.[8] Ultimately, DuPont was fined $16.5 million dollars in 2005 for failing to disclose information about toxicity and health risks cause by PFOA.[9] Although PFOA and perfluoro-octane sulfonic acid (PFOS) have now been phased out of production in the U.S.,[10] 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.[11] 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.[12] 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.[13] 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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[8] *Id.*

[9] 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.

[10] 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.

[11] *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.

[12] *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).

[13] 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 been proposed to date, and even this limited action will take years.[14]

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, including release from federal facilities in Massachusetts.

Massachusetts 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 MassDEP has broad authority to promulgate rules that limit additional exposure to unsafe levels of PFAS in drinking water.[15] 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 these reasons, MassDEP should stop putting public health at risk and adopt a treatment technique drinking water standard that will protect Massachusetts residents from the class of PFAS. As an interim step, MassDEP should immediately adopt Vermont's PFAS Health Advisory as a drinking water standard for public water systems.

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[14] *The Federal Role in the Toxic PFAS Chemical Crisis, Hearing on SD-342 Before the Subcommittee 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.

[15] *See* Mass. Gen. Laws ch. 111, § 160 ("[MassDEP] may make rules and regulations and issue such orders as in its opinion may be necessary to prevent the pollution and to secure the sanitary protection of all such waters used as sources of water supply and to ensure the delivery of a fit and pure water supply to all consumers."); *see also* 310 Mass. Code Regs. 22.03 (stating that in the event MassDEP "finds on the basis of a health assessment . . . that the level of any contaminant found in water collected within a Distribution System and/or at a Sampling Point at the entry to a Distribution System, poses an unacceptable health risk to consumers . . . the Supplier of Water shall take appropriate actions to reduce the level of contaminant concentrations to levels [MassDEP] deems safe or remove the source of supply from service by the deadline specified by [MassDEP].").

## 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.[16] These chemicals are extremely strong and highly resistant to degradation.[17]

PFAS are toxic to humans in very small concentrations—in the *parts per trillion*.[18] PFAS are suspected carcinogens and have been linked to growth, learning and behavioral problems in infants and children; fertility and pregnancy problems, including pre-eclampsia; interference with natural human hormones; increased cholesterol; immune system problems; and interference with liver, thyroid, and pancreatic function.[19] PFAS have been linked to increases in testicular and kidney cancer in human adults.[20] The developing fetus and newborn babies are particularly sensitive to some PFAS.[21]

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[16] Seth Kerschner and 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.

[17] 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.

[18] 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.

[19] *Id.*

[20] *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://www.ncbi.nlm.nih.gov/pmc/articles/PMC3855514/pdf/ehp.1306615.pdf.

[21] U.S. Envtl. Prot. Agency, *Drinking Water Health Advisory for Perfluorooctane 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).[22] There are no medical interventions that will remove PFAS from the body.[23]

PFAS are very resistant to breakdown, bioaccumulate, and easily migrate. "As a result, they may be found throughout the environment in groundwater, surface water, soil, and air, as well as in food, breast milk, and human blood serums."[24] 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.[25] PFOA and PFOS were found in up to 99 percent of the U.S. general population between 1999 and 2012.[26] PFAS are found in human breast milk and umbilical cord blood.[27]

While a great deal of public attention has recently been paid to PFOA and PFOS, and MassDEP recently issued Office of Research and Standards Guidelines (ORSGs) of 70ppt for five PFAS compounds (PFOA, PFOS, perfluoroheptanoic acid (PFHpA), PFNA, PFHxS), when all or some of these occur together in drinking water,[28] 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.[29] For example, all PFAS share a strong carbon-flourine bond and

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[22] *Id.* at 39.
[23] Vermont Dep't of Health, *Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) in Drinking Water*, July 9, 2018, http://www.healthvermont.gov/sites/default/files/documents/pdf/ENV_DW_PFAS.pdf.
[24] Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls*, *supra* note 18, at 2.
[25] Ctr. for Disease Control and Prevention, *Per- and Polyfluorinated Substances (PFAS) Factsheet* (Apr. 7, 2017), https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html.
[26] 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.
[27] Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls*, *supra* note 18, at 3.
[28] MassDEP, Office of Research and Standards Guideline for Per- and Polyfluoroalkyl Substances (PFAS), including the US EPA UCMR3 analytes, June 8, 2018, https://www.mass.gov/files/documents/2018/06/11/orsg-pfas-20180608.pdf.
[29] *See, e.g.*, U.S. Envtl. Prot. Agency, *supra* note 11 (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."[30] 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. 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 Massachusetts drinking water, groundwater, and surface waters.

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 surface water, and have been found in waters throughout Massachusetts.

#### 1. Drinking Water

Groundwater in Barnstable, Massachusetts has been particularly susceptible to the spread of PFAS because of the town's location in an outwash plain with permeable soil.[33] In addition, there have been multiple sources of PFAS entering the system, including fire training areas, airports, and landfills, which have led to an ongoing threat to the sole source aquifer that provides drinking water for all Cape Cod residents.[34]

A 2009 sampling of 20 wells and two distribution systems that supply drinking water on Cape Cod found that 75 percent of test sites had detectable levels of chemicals, including PFOA and PFOS.[35] PFOS was one of the top two most frequently detected, and the levels detected were among the highest reported in U.S. drinking water.[36] PFOS and PFOA were found at high levels in Hyannis Water System wells downgradient of the Barnstable Municipal Airport. At the time the 2009 study was completed EPA's Provisional Health Advisory for PFOA and PFOS was

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[30] 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.
[31] *Id.*
[32] *Id.*
[33] Sources, Transport, Exposure & Effects of PFASs, Cape Cod, THE UNIV. OF RHODE ISLAND, https://web.uri.edu/steep/communities/cape-cod/.
[34] *Id.*
[35] *Tests find new contaminants in Cape Cod's drinking water supply, septic systems are likely the main source of pollution*, SILENT SPRING INSTITUTE (May 10, 2010), https://silentspring.org/research-update/tests-find-new-contaminants-cape-cod's-drinking-water-supply-septic-systems-are
[36] *Id.*

higher[37] than the Drinking Water Health Advisory (EPA Health Advisory) levels for PFAS eventually set in 2016. Lowered safety levels for the PFAS contaminants place a number of the wells above EPA's new guidelines.

PFAS contamination of public drinking water supplies in Massachusetts is by no means limited to Cape Cod. For example, drinking water supplied to the Town of Ayer from the Grove Pond Water Treatment Plant exceeded 70 ppt (combined) for five PFAS compounds until one of the three Grove Pond wells was closed in 2018. Drinking water from the Grove Pond Plant still exceeds 20 ppt.

### 2. Groundwater

In Cape Cod, groundwater contamination from PFAS has been linked to several sources, including fire training areas, airports, military bases, landfills, municipal wastewater, and septic systems.[38] In July of 2015, Barnstable Airport conducted investigations of PFAS in six monitoring wells and PFAS compounds were detected in all of them.[39] PFAS concentrations were above the EPA Health Advisory limits in two of the six wells.[40]

Additional groundwater investigations conducted in response to the Barnstable Airport findings speculated that the source of the PFAS contamination was the Airport Rescue and Fire Fighting Building, a fire fighting training deployment area. The resulting investigation found that there was heavy use of aqueous film forming foam (AFFF) at the fire training academy.

Also, in Weymouth, Massachusetts, PFAS has been detected in groundwater near the site of the former Naval Air Station.[41] Operational closure of the airfield was effected in September of 1996, however the area was used as a location for fire-fighting training exercises from 1950 until 1990.[42] Likely due to the heavy use of AFFF, a 2010 investigation determined widespread PFAS

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[37] U.S. Envtl Prot. Agency, *Provisional Health Advisories for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS)*, January 8, 2009, https://www.epa.gov/sites/production/files/2015-09/documents/pfoa-pfos-provisional.pdf.

[38] *Sources, Transport, Exposure & Effects of PFASs*, *supra* note 35.

[39] Immediate Response Action Plan Status Report 3: Barnstable Municipal Airport, prepared by Horsley Witten Group, Inc. (April 18, 2017), http://eeaonline.eea.state.ma.us/EEA/fileviewer/Default.aspx?formdataid=0&documentid=445359 (Responding to a Notice of Responsibility issued by MassDEP, tasking Barnstable Airport with investigating for PFAS previously detected in groundwater at the airport, and at a monitoring well downgradient of the Airport on the Maher wellfield property).

[40] *Id.*

[41] U.S. Envtl Prot. Agency, *South Weymouth Naval Air Station: Cleanup Activities*, https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=0101826

[42] *Id.*

contamination in soils, groundwater, and surface water.[43] The investigation revealed the presence of PFAS in groundwater at concentrations exceeding the EPA Health Advisory.[44]

#### 3. Surface Water

A study of the Joint Base in Bourne, Massachusetts includes surface water reports showing PFAS contamination above the EPA Health Advisory level.[45] Contamination was again linked to heavy use of AFFFs.[46] Specifically, contaminated surface water was detected in Ashumet and John's Pond and led to findings of affected residential water wells including those in the Lakeside Estates Community and Mashpee Village.[47]

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

In the absence of federal safeguards, Massachusetts must act to protect drinking water and limit Massachusetts 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]

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[43] *Id.*
[44] Tetra Tech, *Signed Explanation of Significant Differences Re: Area of Concern Hangar 1, Former Naval Air Station South Weymouth*, December 15, 2011, https://www3.epa.gov/region1/superfund/sites/sweymouth/497699.pdf
[45] Mass. Dept. of Envtl. Prot., *supra* note 12.
[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.*

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 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, Massachusetts should adopt a treatment technique drinking water standard that protects Massachusetts residents from exposure to unsafe levels of all chemicals in the PFAS class.

### B. The current ORSG for PFAS does not protect Massachusetts residents.

Massachusetts's current ORSG for PFAS does not protect the Massachusetts residents from exposure to unsafe PFAS levels in public water systems. Even though Massachusetts has issued these ORSGs, public water systems in Massachusetts 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. In June of 2018, the MassDEP's Office of Research and Standards issued the guideline for five PFAS compounds (PFOA, PFOS, PFHpA, PFNA, PFHxS).[53] MassDEP also adopted an interim guidance on sampling and analysis for PFAS at disposal sites regulated under the Massachusetts Contingency Plan.[54] However, MassDEP has yet to adopt an MCL or establish an alternative drinking water standard for PFAS, which means that public water

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[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.
[51] 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.
[52] Zhanyun Wang et al., *supra* note 50.
[53] Mass. Dept. of Envtl Prot., *supra* note 4.
[54] Mass. Dept. of Envtl Prot., *Interim Guidance on Sampling and Analysis for PFAS at Disposal Sites Regulated under the Massachusetts Contingency Plan*, June 19, 2018, https://www.mass.gov/files/documents/2018/06/19/2018-06-19%20-%20MassDEP%20BWSC%20PFAS%20Sampling%20Guidance.pdf.

systems in Massachusetts are not required to monitor for or treat unsafe concentrations of PFAS. Even if the ORSG for PFAS were adopted as an MCL, it 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.

MassDEP has broad authority to regulate unsafe chemicals in drinking water.[55] 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 MassDEP to delay the promulgation of a drinking water standard for the PFAS class to address this public health crisis "perfect storm."

#### 1. MassDEP has the authority to adopt a treatment technique drinking water standard.

MassDEP has authority to adopt a treatment technique drinking water standard for PFAS. Pursuant to Mass. Gen. Laws ch. 111, § 310, MassDEP "may make rules and regulations and issue such orders as in its opinion may be necessary to prevent the pollution and to secure the sanitary protection of all such waters used as sources of water supply and to ensure the delivery of a fit and pure water supply to all consumers."[56] The Massachusetts Drinking Water Regulations do not expressly provide for how MassDEP should establish water standards but it recognizes MassDEP's authority, after it has made a finding that a level of a contaminant poses an unacceptable health risk, to require a public water system to take actions to "reduce the level of contaminant concentrations to levels [MassDEP] deems safe or remove the source of supply from service." 310 CMR 22(8). MassDEP made such a finding for at least five PFAS compounds (PFOA, PFOS, PFHpA, PFNA, PFHxS) when it issued the ORSG for PFAS.

"A treatment technique is an enforceable procedure or level of technological performance which public water systems must follow to ensure control of a contaminant."[57] 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."[58] EPA has adopted

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[55] Mass. Gen. Laws Ch. 111, § 160; 310 Mass. Code Regs. 22.03.
[56] Mass. Gen. Laws Ch. 111, § 310. The Commonwealth of Massachusetts has primacy for the Safe Drinking Water Act in Massachusetts and has adopted the authority of the Safe Drinking Water Act via rulemaking. Mass. Dep't of Envtl. Protection, *Massachusetts Drinking Water Regulations*, 310 CMR 22.
[57] U.S. Envtl. Prot. Agency, *How EPA Regulates Drinking Water Contaminants*, https://www.epa.gov/dwregdev/how-epa-regulates-drinking-water-contaminants.
[58] 42 U.S.C. § 300g-1(b)(7)(A).

several treatment technique drinking water standards in lieu of an MCL where EPA has determined that it is "not om technologically feasible to ascertain the level of [a] contaminant."[59] For example, the Lead and Copper Rule requires the use of a treatment technique.[60] 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.[61] 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.[62] 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. MassDEP has the authority to develop a procedure that would require installation of specific drinking water treatment technologies under certain circumstances. MassDEP has multiple options to protect Massachusetts residents from exposure to the PFAS class. For example, MassDEP 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.[63] Non-targeted analysis allows "researchers [to] rapidly characterize thousands of never studied chemical compounds in a wide variety of environmental, residential, and biological media.[64] 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. MassDEP 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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[59] *Id.*
[60] U.S. Envtl. Prot. Agency, *How EPA Regulates Drinking Water Contaminants, supra* note 57.
[61] U.S. Envtl. Prot. Agency, *Lead and Copper Rule*, https://www.epa.gov/dwreginfo/lead-and-copper-rule.
[62] U.S. Envtl. Prot. Agency, *Surface Water Treatment Rules, https://www.epa.gov/dwreginfo/surface-water-treatment-rules*.
[63] 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.
[64] *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 MassDEP were to adopt the current ORSG (or a lower ppt value) as an MCL, a combined limit for five PFAS would not protect Massachusetts residents from the 3,000 or more other PFAS.[65]

First, in addition to PFOA, PFOS, PFHxS, PFHpA, and PFNA, other PFAS have been found or are being investigated in Massachusetts, including, for example, PFBS.[66] There are likely many other PFAS in Massachusetts that the Commonwealth is simply not aware of yet given the speed and secrecy with which chemical manufacturers have introduced these dangerous chemicals into commerce.[67]

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."[68] 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.[69] 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.[70] In light of the unique challenges associated with regulation of these chemicals, EPA promulgated a group MCL even in the absence of complete information about each individual haloacetic acid in order to better protect public health.[71] For all these reasons, it is appropriate to regulate PFAS chemicals as a class.

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[65] KEMI Swedish Chemicals Agency, *supra* note 51, at 6.
[66] Massachusetts Dept. of Envtl Prot., *supra* note 4.
[67] Environmental Working Group Comments on the Agency for Toxic Substances and Disease Registry (ATSDR) Draft Toxicological Profile for Perfluoroalkyls, ENVTL WORKING GROUP (August 20, 2018), https://cdn.ewg.org/sites/default/files/testimony/EWG%20Comments%20for%20ATSDR_Aug20..pdf?_ga=2.236461961.949885036.1539136763-1789323056.1527870942.
[68] Blum, *supra* note 31.
[69] *Drinking Water Guidance, Grouping Process for Drinking Water Health Advisories*, *supra* note 87.
[70] 63 Fed. Reg. 69390, 69409 (Dec. 16, 1998), https://www.gpo.gov/fdsys/pkg/FR-1998-12-16/pdf/98-32887.pdf#page=1.
[71] *Id.*

### 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.[72] EPA has only developed targeted test methods for 14 PFAS chemicals out of more than 3,000 compounds.[73] 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 Massachusetts residents.

As MassDEP 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 Massachusetts 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 standards and serve as the benchmark of practicality and effectiveness for other treatment technologies."[74]

While new adsorption technologies like organically modified silica adsorbents show promise,[75] GAC has long been used for adsorption of chemical pollutants, consistently removes PFOS with an efficiency of more than 90 percent, and is the treatment technique specified in Safe Drinking Water Act (SDWA) for the control of synthetic organic chemicals:

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[72] KEMI Swedish Chemicals Agency, *supra* note 51.
[73] Mass. Dept. of Envtl Prot., *supra* note 60, at 10-12.
[74] J. Horst et al., *Water Treatment Technologies for PFAS: The Next Generation, 38,* Groundwater Monitoring & Remediation (Spring 2018), at 15.
[75] *Id.* at 15–16.

> 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.[76]

Separation technologies, including reverse osmosis, microfiltration, ultrafiltration and nanofiltration, are highly effective for PFAS removal and can remove PFAS at more than 99% effectiveness.[77] "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."[78] 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.[79]

Finally, novel destructive treatment technologies for PFAS are becoming available. Destructive technologies include sonochemical decomposition, chemical/advanced photochemical oxidation, and AECOM's DE-FLUOROTM technology.

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)).[80] 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.[81]

For all these reasons, CLF and Toxics Action Center urge MassDEP to initiate a rulemaking for a treatment technique drinking water standard for the PFAS class.

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[76] 42 U.S.C. § 300g-1(b)(4)(D).
[77] Kucharzyk et al, *supra* note 103, at 759–60; Horst, supra note 101.
[78] 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.
[79] Horst et al., at 17.
[80] U.S. Envtl. Prot. Agency, *Welcome to the Drinking Water Treatability Database, Granular Activated Carbon*, https://oaspub.epa.gov/tdb/pages/treatment/treatmentContaminant.do.
[81] *Id.*

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

MassDEP must take action to establish drinking water standards for PFAS in the absence of federal safeguards even if MassDEP does not establish a treatment technique standard. As discussed in Section II.C, MassDEP has the authority to regulate PFAS as a class or on a chemical-by-chemical basis. PFAS are present in Massachusetts waters and are known to cause adverse health effects. Thus, at a bare minimum, MassDEP 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 will need to be modified.

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

In the interim and until MassDEP establishes a treatment technique drinking water standard for PFAS, MassDEP 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 and Toxics Action Center petition MassDEP to establish a drinking water standard for PFAS that is protective of public health. Specifically, MassDEP should adopt a treatment technique drinking water standard for the PFAS class. In the alternative, MassDEP should establish an MCL for the PFAS class or individual MCLs for each PFAS chemical that poses a risk to public water systems in Massachusetts. As an interim step, MassDEP 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 Massachusetts drinking water, groundwater, and surface waters. The dangers this class of chemicals pose to Massachusetts 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:

The Honorable Monica Bharel, MD, MPH
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Massachusetts Department of Public Health

Maura Healey
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