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April 7, 2021

Representative Pugh, Chair
Representative Wood, Vice Chair
Representative McFaun, Ranking Member
Representative Noyes, Clerk
Representative Brumsted
Representative Gregoire
Representative Pajala
Representative Redmond
Representative Rosenquist
Representative Small
Representative Whitman

RE: CLF Testimony in Support of Senate Bill 20: An Act Relating to Restrictions on Perfluoroalkyl and Polyfluoroalkyl Substances and Other Chemicals of Concern in Consumer Products

Dear Chair Pugh, Vice Chair Wood, and Members of the House Committee on Human Services:

Thank you for the opportunity to provide testimony in support of Senate Bill No. 20. My name is Jen Duggan, and I am Vice President and Director of Conservation Law Foundation (CLF) Vermont. CLF is a nonprofit, member-supported, environmental organization working to conserve natural resources, protect public health, and build healthy communities in Vermont and throughout the New England region. CLF has been a leading advocate in Vermont and throughout New England working to address the threat of emerging contaminants like per- and polyfluoroalkyl substances (PFAS). CLF strongly supports Senate Bill No. 20.

Senate Bill No. 20 builds on Vermont's long history of successfully banning toxic chemicals in consumer products. The Legislature has banned phthalates, lead, BPA, mercury, and flame retardants in various commercial products. These laws have protected Vermonters from toxic chemicals, saved taxpayers money, and helped move markets to safer alternatives.

It is clear that Vermont must act once again to protect public health. The U.S. Environmental Protection Agency and the Food & Drug Administration have failed to protect the public from PFAS and the dangerous chemicals that are covered under S. 20 for decades and there is no reason to expect that the new administration will take meaningful action on the timeline and scale that is necessary to protect public health. The reality is that our federal chemical safety laws are fundamentally broken and regulate chemicals one-by-one as chemical manufacturers stay one step ahead. We need state action to address these dangerous chemicals as a class, and Vermont has fallen behind our neighbors and other states across the U.S. It is time for Vermont to catch up with our neighbors and states across the U.S. With S. 20, Vermont would join New York, Maine, New Hampshire, California, Washington, Minnesota, Colorado, and more in taking common sense steps towards getting PFAS out of products, out of our drinking water, and out of our bodies.

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Part I of this testimony provides background on the history and use of PFAS in consumer products, since this class of harmful chemicals is a core focus of S.20. This part also describes the harmful human health impacts resulting from PFAS exposure. Part II discusses the various pathways of human exposure to PFAS, ranging from food packaging, drinking water, and in the case of firefighters, contact with firefighting foam and personal protective equipment. Part III gives an overview of why CLF supports S.20 as an effective upstream solution to "turn off the tap" of these and other harmful chemicals entering Vermont. I discuss each of the products included in the bill, including safe alternatives and actions that other states and industries have already taken to eliminate these chemicals in commercial products.

I. PFAS are Harmful to Human Health

PFAS are extremely persistent; tend to be highly mobile in the environment; can bioaccumulate; can be toxic in small quantities; are used in hundreds of commercial and manufacturing processes; found in thousands of consumer products; and there are over 9,000 different kinds of these dangerous chemicals. 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.[1]

PFAS that have been studied so far have been shown to be toxic in concentrations as small as parts per trillion.[2] These chemicals are associated with cancer 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.[3] PFAS have been linked to increases in testicular and kidney cancer in human adults.[4]

Developing fetuses and newborn babies are particularly sensitive to PFAS chemicals.[5]

> The impacts of PFAS exposure on fetal development and the young have been studied in both humans and animals. These studies find similar and profound adverse health effects.
>
> Since infants and children consume more water per body weight than adults, their exposures may be higher than adults in communities with PFAS in drinking water. In addition, the young may also be more sensitive to the effects of PFAS due to their immature developing

[1] *See Per- and Polyfluoroalkyl Substances (PFAS) and Your Health*, AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, https://www.atsdr.cdc.gov/pfas/overview.html.
[2] U.S. Dep't of Health & Human Serv., Agency for Toxic Substances and Disease Registry, TOXICOLOGICAL PROFILE FOR PERFLUOROALKYLS, AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, at 5–6, https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf.
[3] *Id.*
[4] *Id.* at 6.
[5] *See* DRINKING WATER HEALTH ADVISORY FOR PERFLUOROOCTANOIC ACID (PFOA) at 9.

> immune system, and rapid body growth during development. Exposure to PFAS before birth or in early childhood may result in decreased birth weight, decreased immune responses, and hormonal effects later in life.[6]

As described in a recent study, PFAS exposure occurs *in utero* as a result of placental transfer of PFAS, and there is also a significant, additive PFAS exposure that occurs in infants through breast-feeding.[7]

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 both immune system hypersensitivity and autoimmune disorders like asthma and ulcerative colitis.[8] On top of these serious health threats, a former Director of the National Institute of Environmental Health Sciences recently warned that exposure to even small amounts of PFAS may make people more vulnerable to COVID-19.[9]

While a great deal of public attention has recently been paid to PFOA, PFOS, and other long-chain PFAS, 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.[10] For example, all PFAS share a strong carbon-fluorine bond and "degrade very slowly, if at all, under environmental conditions."[11] Although we have less information about these newer compounds, the information we do have suggests that they are not safe and some may even be more harmful.[12] While some newer fluorinated alternatives seem to be less bioaccumulative, they are still as environmentally persistent as long-chain substances or have persistent degradation products.[13] For example, "[a] recent hazard assessment based on the internal dose of Gen X[, a short-chain PFAS,]

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[6] Anna Reade et al., NRDC, Scientific and Policy Assessment for Addressing Per- and Polyfluorinated Substances (PFAS) in Drinking Water 23 (2019), https://www.nrdc.org/sites/default/files/assessment-for-addressing-pfas-chemicals-in-michigan-drinking-water.pdf.

[7] Helen M. Goeden et al., *A transgenerational toxicokinetic model and its use in derivation of Minnesota PFOA water guidance*, 29 J. OF EXPOSURE SCI. & ENVTL. EPIDEMIOLOGY 183 (2019), https://www.nature.com/articles/s41370-018-0110-5.pdf (concluding that "early life serum levels are predicted to be approximately 40% higher than adult steady-state levels," and that "[w]hen both placental and breastmilk transfer are taken into account. . . early life serum levels were predicted to be sixfold higher than adult steady-state levels.")

[8] *See* DRINKING WATER HEALTH ADVISORY FOR PERFLUOROOCTANOIC ACID (PFOA) at 39.

[9] Sharon Lerner, *Scientists Pin Blame for Some Coronavirus Deaths on Air Pollution, PFAS, and Other Chemicals*, June 26, 2020, https://theintercept.com/2020/06/26/coronavirus-toxic-chemicals-pfas-bpa/.

[10] *See, e.g.*, NRDC, Technical Comments at 4-6; Kwiatkowski et al., *supra* note 16; Arlene Blum et al., *The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)*, 123 ENVTL. HEALTH PERSPECTIVES A 107 (2015), https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.1509934.

[11] Arlene Blum et al., *The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)*, 123 ENVTL. HEALTH PERSPECTIVES A 107 (2015), https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.1509934.

[12] Kwiatkowski et al., *supra* note 16; Elsie Sunderland et al., *A review of the pathways of human exposure to poly- and perfluoroalkyl substances (PFASs) and present understanding of health effects*, 29 J. OF EXPOSURE SCI. & ENVTL. EPIDEMIOLOGY 131 – 147 (2018), https://www.nature.com/articles/s41370-018-0094-1.

[13] Arlene Blum et al., *The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)*, 123 ENVTL. HEALTH PERSPECTIVES A 107 (2015), https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.1509934.

suggests that it has a higher toxicity than PFOA after accounting for toxicokinetic differences."[14] Because some of the newer PFAS are less effective, larger quantities may be needed to provide the same performance.[15] In addition, these newer PFAS compounds are more mobile in the environment. In conclusion, scientific experts agree that these chemicals should be managed as a class due to extreme environmental persistence, toxicity of the PFAS that have been studied, and the potential toxicity and health risks posed by the entire class due to similarities in chemical structure.[16]

II. Pathways for Human Exposure to PFAS

Human exposure to PFAS occurs through ingestion of contaminated drinking water and food, inhalation of indoor air containing PFAS particles from carpets, furniture, or other indoor sources, and contact with other contaminated media, such as PFAS-coated clothing, dental floss, or food packaging.[17] The relative importance of these different sources and pathway categories varies across demographic groups and populations.

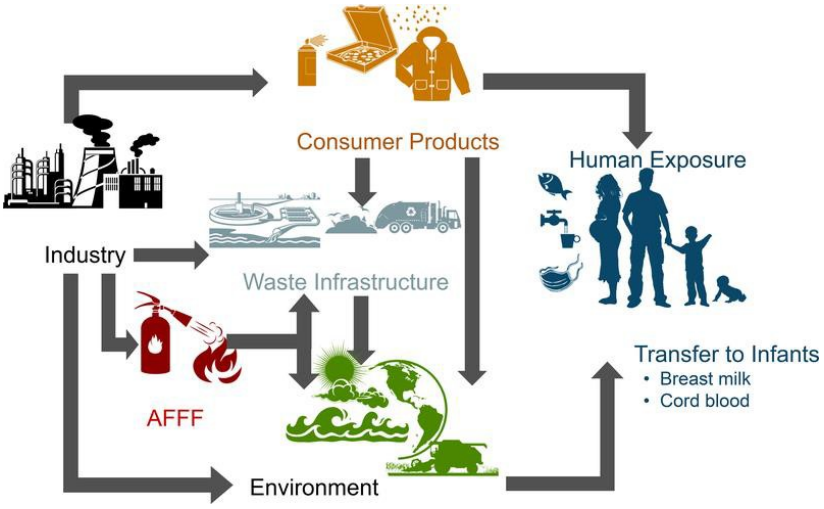

Figure 1. Overview of PFAS exposure pathways for different human populations outside of occupational settings. Sunderland et al. (2019).

[14] Elsie Sunderland et al., *A review of the pathways of human exposure to poly- and perfluoroalkyl substances (PFASs) and present understanding of health effects*, 29 J. of Exposure Sci. & Envtl. Epidemiology 131 – 147 (2018), https://www.nature.com/articles/s41370-018-0094-1.

[15] *Id.*

[16] *See, e.g.*, Technical Comments of Anna Reade, PhD, Natural Resources Defense Council, and Katherine Pelch, PhD, University of North Texas Health Science Center to the Vermont Agency of Natural Resources Re the Advance Notice on the Regulation of Perfluoroalkyl, Polyfluoroalkyl Substances (PFAS) as a Class (Nov. 16, 2020) [hereinafter NRDC, Technical Comments].

[17] Elsie Sunderland et al., *A review of the pathways of human exposure to poly- and perfluoroalkyl substances (PFASs) and present understanding of health effects*, 29 J. OF EXPOSURE SCI. & ENVTL. EPIDEMIOLOGY 131 – 147 (2018).

Food is typically the dominant exposure pathway for humans.[18] Ingestion of PFAS in food can come from contamination of the food directly from packaging containing PFAS, or from absorption and bioaccumulation of PFAS in the food chain.[19] Inhalation of or dermal contact with PFAS is another significant exposure pathway and can occur through contact with PFAS- treated rugs and carpets (e.g., the CDC named carpet as the number one exposure pathway to PFAS for infants and toddlers who spend and lot of time lying, playing and crawling on carpeting),[20] or inhalation of contaminated dust from other indoor PFAS-treated products.[21]

Another major exposure pathway to PFAS is through the waste stream. Many PFAS used in products or in industry enter the waste stream and are channeled to wastewater treatment facilities (WWTFs) which do not remove PFAS from the wastewater. WWTFs are thus point sources for PFAS pollution to our environment. Indeed, sampling conducted in late 2019 and early 2020 by the Vermont Agency of Natural Resources (ANR) and industry consultants detected PFAS in landfill leachate—the garbage juice that seeps out of the landfill after rain or snowmelt—at all four tested landfills, including the State's only active landfill in Coventry.[22] The leachate from the Coventry landfill is trucked to Montpelier's WWTF, among several others, where there is no treatment process for removing PFAS.[23] This explains why every influent and effluent sample collected from the Montpelier WWTF contained PFAS, as did all the samples taken at nearly 20 other WWTFs in Vermont.[24] PFAS were also detected in all of the sampled WWTFs' sludge specimens.[25] Sludge is a biproduct from the wastewater treatment process that is routinely spread on agricultural fields in Vermont as fertilizer – serving as yet another human exposure pathway if food is grown in those fields.

Moreover, when "certified-compostable" PFAS-coated food packaging is discarded as compost waste, research shows PFAS can leach into the finished compost product.[26] This is problematic in two ways: first, if the compost is applied to crops, the plants could absorb the PFAS, and

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[18] *Id.*
[19] *Id.*
[20] Tasha Stoiber, Ph.D., *In a First, California Moves to Protect People from Toxic PFAS in Carpets,* ENVIRONMENTAL WORKING GROUP (Mar. 16, 2018), available at https://www.ewg.org/news-and- analysis/2018/03/first-california-moves-protect-people-toxic-pfas-chemicals-carpets-0.
[21] Elsie Sunderland et al., *A review of the pathways of human exposure to poly- and perfluoroalkyl substances (PFASs) and present understanding of health effects*, 29 J. OF EXPOSURE SCI. & ENVTL. EPIDEMIOLOGY 131 – 147 (2018).

[22] ANR Handout for Senate Natural Resources Committee (Feb. 14, 2020), at 7-25.
[23] *See, e.g.,* John Dillon, *Vt. Landfill Case Highlights 'Garbage Juice' Chemicals In Drinking Water*, VPR (stating that Kurt Motyka, Montpelier assistant public works director, said the Montpelier WWTF is not designed to treat PFAS), available at https://www.vpr.org/post/vt-landfill-case-highlights-garbage-juice-chemicals-drinking- water#stream/0.
[24] ANR Handout for Senate Natural Resources Committee, *supra* note 32, at 7-25.
[25] *Id.*
[26] Youn Jeong Choi, Rooney Kim Lazcano, Peyman Yousefi, Heather Trim, Linda S. Lee. Perfluoroalkyl Acid Characterization in U.S. Municipal Organic Solid Waste Composts**.** *Environmental Science & Technology Letters*, 2019, available at https://www.sciencedaily.com/releases/2019/05/190529084838.htm.

humans could be exposed by ingesting the chemicals in the food;[27] second, shorter-chain PFAS molecules are very soluble and can move from soils into groundwater and rivers, thus threatening drinking water supplies.[28] In Vermont, nearly 100 public drinking water supplies have tested positive for at least one PFAS compound.[29]

Finally, occupational exposure to PFAS is particularly concerning for those working in industries that either manufacture PFAS or rely on PFAS-contaminated products or personal protection equipment (PPE), such as firefighters who use synthetic PFAS-containing foams designed for flammable liquid fires, also called Class B fires, and who wear PPE coated in PFAS.

III. S.20 is an Effective Upstream Solution to "Turn Off the Tap" of Harmful PFAS and other Chemicals Entering Vermont

CLF supports S.20 as a commonsense, cost-effective, up-stream solution to protect Vermonters from further toxic exposure. PFAS have been found at unsafe levels in the environment throughout Vermont, including drinking water, groundwater, surface waters, and soils. While the State of Vermont is making good progress cleaning up existing PFAS contamination, remediation is extremely costly in terms of clean-up and in terms of redressing the health impacts of exposed Vermonters. In some cases, remediation is impossible.[30] Accordingly, in addition to remediation efforts, the State must also pursue "upstream solutions" to turn off the tap of these harmful chemicals entering our environment in the first instance. S.20 accomplishes this objective by restricting the addition of these harmful chemicals in products manufactured and distributed in Vermont.

1. S.20 appropriately regulates PFAS and other chemicals *as a class*, as opposed to one-by-one.

While a great deal of public attention has recently been paid to PFOA, PFOS, and other long- chain PFAS substances, the U.S. Environmental Protection Agency (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.[31] For example, all PFAS share a strong

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[27] *See* Colin O'Neil and David Andrews, *FDA Tests Confirm Suspicions about PFAS chemicals in food*, ENVIRONMENTAL WORKING GROUP, (June 3, 2019), https://www.ewg.org/news-and-analysis/2019/06/fda-tests- confirm-suspicions-about-pfas-chemicals-food; Blaine et al., *Perfluoroalkyl Acid Distribution in Various Plant Compartments of Edible Crops Grown in Biosolids-Amended soils*, ENVIRON. SCI. TECHNOL. 2014, 48, 14, 7858- 7865.

[28] Ernie Kelley & Eamon Twohig, *VT Dep't of Envtl. Conservation Residual Waste & Emerging Contaminants Program, Wastewater Treatment Sludge and Septage Management in Vermont* 41 (2018), https://dec.vermont.gov/sites/dec/files/wmp/residual/RMSWhitePaper20180507.pdf.

[29] ANR Handout for Senate Natural Resources Committee, *supra* note 32, at 4.

[30] Carol F. Kwiatkowski et al., *Scientific Basis for Managing PFAS as a Chemical Class* ENVIRONMENTAL SCIENCE & TECHNOLOGY LETTERS (June 12, 2020) at F, available at: https://dx.doi.org/10.1021/acs.estlett.0c00255.

[31] *See, e.g.*, Consent Order, *In the matter of: Dupont Company,* (Nos. P-08-508 and P-08-509, U.S. E.P.A. Office of Pollution Prevention and Toxics, April 9, 2009), at vii (stating that, with respect to "GenX" compounds (chemical

carbon-flourine bond and "degrade very slowly, if at all, under environmental conditions."[32] Although we have less information about these newer compounds, the information we do have suggests that they are not safe. In fact, the information we do have suggests the opposite: these compounds pose just as great of a health risk as longer-chain PFAS.[33] While some newer fluorinated alternatives seem to be less bioaccumulative, they are still as environmentally persistent as long-chain substances or have persistent degradation products.[34] For example, "[a] recent hazard assessment based on the internal dose of Gen X[, a short-chain PFAS,] suggests that it has a higher toxicity than PFOA after accounting for toxicokinetic differences."[35] Because some of the newer PFAS are less effective, larger quantities may be needed to provide the same performance.[36] In addition, these newer PFAS compounds are more mobile in their environment.[37] In conclusion, "the extreme environmental persistence, bioaccumulation, and potential toxicity of the entire class of PFAS has led some researchers to question the use of any highly fluorinated chemicals and to call for a class approach in managing them."[38]

While a class-based approach to chemical management is different from the traditional paradigm of individual chemical risk assessment, the extreme persistence and potential for harm from thousands of PFAS demand a more efficient and effective approach. A recently published article in the journal Environmental Science and Technology Letters, titled *Scientific Basis for Managing PFAS as a Chemical Class*, asserts that "[i]t is not possible to thoroughly assess every individual PFAS chemical, or combination of PFAS chemicals, for their full range of effects in a reasonable time frame."[39] Without effective risk management action around the *entire class* of PFAS, these chemicals will continue to accumulate and cause harm to human health and ecosystems for generations to come.

The approach of regulating chemicals as a class has already been successfully adopted in other cases where substances have common chemical characteristics, including the regulation of organophosphate pesticides, organochlorine pesticides, and organohalogen flame retardants.[40]

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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.") available at https://assets.documentcloud.org/documents/2746607/Sanitized-Consent-Order-P08-0508-and-P08-0509.pdf; Arlene Blum et al., *The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)*, 123 ENVTL. HEALTH PERSPECTIVES A 107, A 107 (2015), https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.1509934.

[32] Arlene Blum et al., *The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)*, 123 ENVTL. HEALTH PERSPECTIVES A 107, A 107 (2015), https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.1509934.

[33] Sunderland, *supra* note 19, at 29.

[34] Blum, *supra* note 34, at A 107.

[35] Sunderland, *supra* note 19.

[36] *Id.*

[37] *See* Stephen Brendel et al., *Short-Chain Perfluoroalkyl Acids: Environmental Concerns and a Regulatory Strategy under REACH,* 30 ENVTL. SCI. EUR. 9, at 4 (2018) available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5834591/pdf/12302_2018_Article_134.pdf.

[38] Sunderland, *supra* note 19.

[39] Carol F. Kwiatkowski et al., *Scientific Basis for Managing PFAS as a Chemical Class*, ENVIRONMENTAL SCIENCE AND TECHNOLOGY LETTERS (June 12, 2020) (a copy of this article is being submitted along with this written testimony).

[40] *Id.*

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Further, this approach is supported by scientists familiar with the wide array of PFAS compounds. In the 2015 "Madrid Statement," more than 200 scientists advocated for a class-based management approach for PFAS by limiting the production and use of the entire class of PFAS, including polymers, to essential uses.[41] According to over a dozen scientists who authored the journal article referenced above stating the scientific basis for managing PFAS as a class, "managing PFAS as a class is scientifically sound, will provide business innovation opportunities, and will help protect our health and environment now and in the future."[42]

Governments are also increasingly using or advocating for broader management approaches to control PFAS exposure. For example, Maine and Washington banned all PFAS in food contact materials, several states have enacted bans against all PFAS in firefighting foam, and California has proposed to regulate any PFAS used in carpets and rugs (all these bans are discussed further

below). The Vermont ANR recently advocated for a class-based management approach in comments submitted to EPA related to the addition of certain PFAS substances to the Community Right-to-Know Act toxic chemical release reporting requirements. ANR suggested that EPA require reporting of *all PFAS*, "not just those substances currently active in commerce," and recommended adding certain PFAS chemicals to the reporting list as individual listings, and all other PFAS to the list *as a "chemical category."* [43]

Retailers and manufacturers are headed in this direction as well. For instance, home retailer IKEA committed to a complete phase-out of all PFAS in its textile products and reported achieving this goal as of 2016.[44] Similarly, Target, Nike, Levi Strauss & Co., H&M, and other well-known companies either already have or are working towards phasing out all PFAS in their products.[45]

For the reasons stated above, it is important that S.20 bans the use of the *entire class* of PFAS, phthalates, and bisphenol chemicals. We know the failures that come from banning chemicals one at a time—such as with BPA—which this body banned from certain products back in 2010. In its place, the industry started using other bisphenol chemicals like BPS that turned out to also have similar negative health impacts, acting as endocrine disruptors.

Similarly, when this body banned certain flame retardant chemicals, the industry simply started using other similar chemicals, which proved harmful. The Legislature then had to come back and ban these other chemicals. Now states are starting to ban the entire class of organohalogen flame retardants, to avoid this ineffective, whack-a-mole approach. Vermonters deserve a better approach

[41] The Madrid Statement (May 2015), available at https://greensciencepolicy.org/madrid-statement/.
[42] Carol F. Kwiatkowski et al., *supra* at 41.
[43] Comments of The Vermont Agency Of Natural Resources and the Vermont Department Of Public Safety on the Addition of Certain Per- and Polyfluoroalkyl Substances to Community Right-to-Know Toxic Chemical Release Reporting (Feb. 2, 2020) (emphasis added).
[44] Ikea. IKEA FAQ: Highly fluorinated chemicals. https://www.ikea.com/ms/en_US/pdf/reports-downloads/product_safety/IKEA_FAQ_highly_fluorinated_chemicals.pdf.
[45] The Business Case for Eliminating PFAS Chemicals from Consumer Products, American Sustainable Business Council, available at https://www.asbcouncil.org/sites/main/files/file-attachments/asbc-elimpfaschemicals-ff_0.pdf.

to protect their health by addressing classes of chemicals—this is the approach other states and corporations are taking, and CLF supports our Legislature taking a similar route with this bill.

2. S.20 follows the lead of other states and industries in banning some of the most toxic, widely used products on the market.

S.20 targets five different kinds products that may contain PFAS: (i) food packaging; (ii) firefighting foam; (iii) carpets and rugs, (iv) children's products, and (v) ski wax. The consumer products covered by this bill are some of the most toxic and dangerous products due to their high PFAS content and the human exposure pathways associated with their use. As described in more detail below, there are market-available, cost-effective, equally functional versions of each of these products that do not contain PFAS. Additionally, Vermont would be following the lead of other states and industry giants that have already taken action to ban harmful PFAS from these products.

i. Firefighting Foam

Language of the bill: The first two sections of S.20 restrict the manufacture, sale, or distribution of class B firefighting foam to which PFAS have been intentionally added, and requires disclosure of the manufacture, sale, or distribution of personal protective equipment (PPE) containing PFAS.

Why is firefighting foam included?

Class B firefighting foam is widely used in the U.S. to fight gas fires. PFAS are added to firefighting foam because of their surfactant qualities. PFAS from foam are dispersed into the environment through inhalation or absorption. Fire fighters working with materials containing PFAS, such as class B firefighting foam, are at high risk of absorbing or ingesting PFAS. Statistics from a National Institute for Occupational Safety and Health report show that firefighters are more likely than the general public to be diagnosed with cancer and even more likely to die from cancer.[46] The International Association of Fire Fighters reported last year that since 2002, 61 percent of firefighter deaths in the line of duty were caused by cancer, and in 2016, 70 percent of firefighter deaths were as a result of cancer.[47] By restricting the use of PFAS foam, firefighters will be exposed to fewer toxic chemicals.

To be clear, S.20 would restrict the actions of *manufacturers* of the firefighting foam and PPE containing PFAS, not the actions of firefighters or local departments. Local firefighting departments would not be required to cease the use of their firefighting foam and equipment containing PFAS; they would just be unable to purchase foam containing PFAS in the future and would be made aware when equipment contains PFAS.

[46] Testimony of Bradley Reed, President of the Professional Firefighters of Vermont, before Senate Committee on Health & Welfare, Feb. 21, 2020, available at: https://legislature.vermont.gov/Documents/2020/WorkGroups/Senate%20Health%20and%20Welfare/Bills/S.20/Written%20Testimony/S.20~Bradley%20Reed~Testimony~2-21-2020.pdf.
[47] *Id*.

Are there viable PFAS-free alternatives?

Yes, the fluorine-free firefighting foam market is well-established, cost-competitive, and supported by firefighters. According to Bradley Reed, President of the Professional Firefighters of VT, "[t]here are alternative products on the market that perform in a manner consistent with the needs of firefighters combating class B fuel spills and flammable liquid fires, and recent actions by the federal government support efforts to transition away from [PFAS foam] to non-fluoridated foams if they so choose."[48] According to a 2018 report released by the International Pollutants Elimination Network (IPEN), "[o]perational use in incidents in the real world and due diligence during the procurement process have proved beyond all reasonable doubt that fluorine-free foams (F3s) perform equally well compared to [PFAS foams] under many conditions and continue to improve."[49] Captain Kurt Plunkett of the Seattle, Washington firefighting department noted how switching to PFAS-free foam actually had associated cost savings:

"We did head-to-head live fire testing of foams and chose our fluorine-free foam because it was effective for multi-class fires, and it had the benefit that it didn't have deleterious effects on fish and it was biodegradable. We have never seen a fish kill from use or accidental discharge of this product. It has been a very effective product for firefighting and it is less costly. Even though some of these new foams cost more per gallon, it's a quarter to a third cheaper when it's diluted for use. We saw a big cost savings and we're ahead environmentally."[50]

Have other states or industry banned PFAS in firefighting foam?

Yes, the language in this bill is modeled on legislation enacted in 2018 in Washington State, and enacted in 2019 in New Hampshire and Colorado, as well as a similar law signed by Governor Cuomo in New York earlier this year. Minnesota, Kentucky, and Michigan have also followed suit. Additionally, the federal government has already banned or is moving in the direction of banning PFAS-containing firefighting foams. The National Defense Authorization Act for Fiscal Year 2020 bans use of firefighting foam containing PFAS after October 1, 2024, with limited exceptions. And use of such foam for training and any purpose other than putting out fires is banned immediately.[51]

If the Legislature enacted S.20, Vermont would be in line with what many other states have already done and would ensure our firefighters and residents are better protected against PFAS in firefighting foam and PPE.

ii. Food Packaging

Language of the bill: S.20 bans PFAS, in addition to toxic phthalates and bisphenals (if certain circumstances are met) from our food packaging.

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[48] *Id*.
[49] International Pollutants Elimination Network (IPEN) titled *Flourine-free Firefighting Foams (3F) Viable Alternatives to Flourinated Aqueous Film-Forming Foams* (2018).
[50] *What Experts Are Saying About Fluorine-Free Foam*, Toxic Free Future, Firefighter Testimonials.
[51] Testimony of Bradley Reed, *supra* note 56.

Why is food packaging included?

Paper products used to make food packaging are often treated with PFAS for water and grease resistance. In testing, deli-sandwich wrappers, French-fry boxes, popcorn bags, bakery bags, and to-go containers have all been found to contain PFAS.[52] When PFAS are used in food packing, they can migrate into our food.[53] For a typical adult, dietary exposure is likely to be the single largest exposure pathway of PFAS.[54] Further, after the food packaging is used, it is then thrown away or composted, which as described in Part II above, puts our drinking water and surface waters at risk for contamination.

Are there viable PFAS-free/phthalate-free alternatives?

Yes, manufactures have successfully produced price-competitive alternatives.[55] Not only do these alternatives already exist, but a lot of food packaging is not made with PFAS to begin with. A recent study published by the Center for Environmental Health found that 43 percent of paper food packaging tested did not test positive for PFAS.[56] The Environmental Health Strategy Center in Maine developed a helpful handout detailing alternative food packaging options for phthalates, which we submitted as part of our testimony delivered on June 24, 2020.[57]

Additionally, major grocery chains like Hannaford's have already moved to ban PFAS, phthalates, and BPA (bisphenol-A) from its products.[58] Trader Joe's and Whole Foods also announced action to restrict PFAS in their food packaging.[59] Restaurant chains like Taco Bell are also proactively banning these harmful chemicals from the food packaging they sell.[60] These cases demonstrate the availability of safer, cost-comparable alternatives, as well as the market pressure already underway to provide safer alternatives.

Have other states or industry banned PFAS/phthalates/bisphenols in in food packaging?

Yes. Washington banned PFAS from food packaging in 2018, then Maine banned both PFAS and phthalates in 2019.[61] S.20 builds on this work, and bans PFAS, phthalates, and bisphenols from

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[52] *Avoiding Hidden Hazards: A Purchaser's Guide to Safer Foodware* ("Avoiding Hidden Hazards"), CENTER FOR ENVIRONMENTAL HEALTH, available at www.ceh.org/disposablefoodware.
[53] Jane Muncke et al., *Impacts of food contact chemicals on human health: a consensus statement*, ENVIRONMENTAL HEALTH (2020) (submitted with prior testimony of Elena Mihaly on June 24, 2020).
[54] Sunderland, *supra* note 21.
[55] *Avoiding Hidden Hazards*, *supra* note 60.
[56] *Id.* at 3.
[57] *Phthalates Alternatives*, ENVIRONMENTAL HEALTH STRATEGY CENTER (submitted with prior testimony of Elena Mihaly on June 24, 2020).
[58] *Hannaford to Restrict Toxic Chemicals in Food Packaging and Beauty Products* (Sept. 19, 2019), Environmental Health Strategy Center, available at https://www.ourhealthyfuture.org/media/hannaford-restrict-toxic-chemicals-food-packaging-and-beauty-products.
[59] *Id.*
[60] *Taco Bell to phase out toxic chemicals in food packaging* (Jan. 10, 2020), SAFER CHEMICALS HEALTHY FAMILIES, https://saferchemicals.org/2020/01/10/taco-bell-to-phase-out-toxic-chemicals-in-food-packaging/.
[61] Washington SB6428 and HB2658; Maine LD 412 and LD 1433.

food packaging. This harmonizes with other states, while also acknowledging the harm from bisphenols, which this body has already acted on when it banned BPA from certain products a decade ago, and when Vermont added four bisphenol chemicals to the list of chemicals of high concern to children - BPA, BPS, BPF, and TBBPA. Vermont also banned certain phthalates from children's products more than a decade ago, and fourteen phthalates are on our Vermont list of chemicals of high concern to children.

iii. Rugs and Carpeting

Language of the bill: S.20 also bans PFAS from residential carpets and rugs.

Why are carpets and rugs included?

PFAS are often used to make rugs and carpets stain- and water-resistant. Carpets made with PFAS become "PFAS factories," releasing the chemicals over time into our air and dust. As mentioned above, the CDC named carpets as the number one exposure pathway to PFAS for infants and toddlers who spend and lot of time lying, playing, and crawling on carpeting.[62] Later, these textiles also release their toxins into landfills, and subsequently into landfill leachate and waterways. Sampling data from the Casella Waste Systems-operated NEWSVT landfill in Coventry, VT showed that textiles were among the highest load of PFAS coming into the landfill, which likely explains why Casella testified in support of this bill in the Senate.[63]

Are there viable alternatives?

Yes, for most uses. The Danish Ministry of the Environment conducted a survey in 2015 to identify non-PFAS alternatives available for surface treatment and impregnation of textiles including waterproofing spray for private use.[64] While no alternatives matched the PFAS-based repellents on all technical parameters, alternatives existed for several common applications.[65]

[62] Tasha Stoiber, Ph.D., *In a First, California Moves to Protect People from Toxic PFAS in Carpets,* ENVIRONMENTAL WORKING GROUP (Mar. 16, 2018), available at https://www.ewg.org/news-and-analysis/2018/03/first-california-moves-protect-people-toxic-pfas-chemicals-carpets-0.

[63] Testimony of Sam Nicolai, VP of Engineering and Compliance for Casella Waste Systems (Feb. 28, 2020) ("[W]e support the efforts in S.20 to restrict the manufacture, sale, and distribution of PFAS-containing product."), available at: https://legislature.vermont.gov/Documents/2020/WorkGroups/Senate%20Health%20and%20Welfare/Bills/S.20/Written%20Testimony/S.20~Samuel%20Nicolai~Testimony~2-28-2020.pdf.

[64] *Alternatives to perfluoroalkyl and polyfluoro-alkyl substances (PFAS) in textiles,* DANISH MINISTRY OF THE ENVIRONMENT (2015).

[65] *Id*. at 7.

Have other states or industry banned PFAS/phthalates/bisphenols in in food packaging?

Yes. Other states are starting to address PFAS in carpets and carpet treatments, including Washington State, which is beginning a regulatory process to restrict their use,[66] and California identified carpets and rugs containing PFAS chemicals as a priority product that they are working to address under their state's Safer Consumer Products program.[67] Additionally, Home Depot (the world's largest home improvement retailer) and Lowe's (the nation's second-largest home improvement retailer) announced in fall of 2019 that they were proactively banning residential rugs and carpets with PFAS chemicals from being sold in their stores, starting early 2020.[68] This demonstrates the largest retailers in the country know there are cost-competitive alternatives available on the market, and enough supply and opportunity for people to buy carpets and rugs without the unnecessary addition of these toxic PFAS chemicals.

iv. Chemicals of High Concern to Children

Language of the bill: Finally, this bill adds PFAS chemicals to the Act 188 list of chemicals of high concern to children. Addition to this list will simply require reporting the use of these chemicals by manufacturers if they are being used in children's products sold in Vermont.

Have other states or industry acted to add PFAS to their list of chemicals of high concern to children?

Yes. Vermont's Act 188 was modeled closely on Washington state's program, and last year Washington passed legislation to enable their Commissioner to add classes of chemicals to their list of chemicals of high concern to children.[69] New York State recently enacted legislation that also allows classes of chemicals to be added to their list of chemicals of concern to children.[70]

This class-based approach is the direction that states with similar programs are headed. Knowing the potential harm these products cause from exposure when contaminated children's products are in use—plus the problems these chemicals create after disposal—Vermont should start by adding PFAS to our list of chemicals of concern to better understand where and how these PFAS chemicals are being used in our children's products, so we can better address those problems in the future.

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[66] *Washington State Targets PFAS in Carpet and Other Toxics in Products Under New Groundbreaking Law* (Sept. 19, 2019), Toxic-Free Future, available at https://toxicfreefuture.org/washington-state-targets-pfas-in-carpet-and-other-toxics-in-products-under-new-groundbreaking-law/.

[67] *In a First, California Moves to Protect People from Toxic PFAS Chemicals in Carpets* (Mar. 13, 2018), SAFE CHEMICALS, HEALTHY FAMILIES, available at https://www.ewg.org/news-and-analysis/2018/03/first-california-moves-protect-people-toxic-pfas-chemicals-carpets-0.

[68] *The Home Depot bans toxic PFAS in carpets and rugs it sells* (Sept. 17, 2019), SAFE CHEMICALS, HEALTHY FAMILIES, available at https://saferchemicals.org/2019/09/17/the-home-depot-bans-toxic-pfas-in-carpets-and-rugs-it-sells/#:~:text=(WASHINGTON%2C%20D.C.)%20%E2%80%93%20Today,by%20the%20end%20of%202019.

[69] Washington HB 1194 / SB 5135.

[70] New York A6296 / S501.

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Conclusion

CLF supports S.20 as a commonsense, cost-effective, up-stream solution to protect Vermonters from further toxic exposure. PFAS have been found at unsafe levels in the environment throughout Vermont, including drinking water, groundwater, surface waters, and soils. It is time to address this toxic exposure problem—especially in light of the current coronavirus pandemic and the concerning impacts toxics can have on human's immune systems—by going upstream and turning off the tap of these harmful chemicals entering our environment in the first place. S.20 accomplishes this objective by restricting the addition of these harmful chemicals in products manufactured and distributed in Vermont.

Thank you for the opportunity to submit testimony.

Respectfully Submitted,

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