May 31, 2018

Ms. Kara Steward
Washington State Department of Ecology
Hazardous Waste & Toxics Reduction Program
300 Desmond Drive SE
Lacey, WA 98503
*Submitted via* http://wt.ecology.commentinput.com/?id=GAaDQ

**RE: Washington State Interim Chemical Action Plan for Per- and Polyfluoroalkyl Substances (PFAS)**

Dear Ms. Steward:

FluoroCouncil appreciates this opportunity to provide comments on Washington's Interim Chemical Action Plan for PFAS ("Interim PFAS CAP"). FluoroCouncil[1] is a global organization representing the world's leading manufacturers of products based on PFAS. FluoroCouncil has a fundamental commitment to product stewardship and rigorous, science-based regulation, and, as part of its mission, addresses science and public policy issues related to PFAS.

We understand the important issues currently facing Washington regarding elevated levels of certain PFAS found in multiple locations in the state. Further, we appreciate the significant efforts the departments of Ecology and Health have put into drafting the Interim PFAS CAP, which can serve as a critical tool in identifying potential actions to address these PFAS contamination issues. It is crucial that Washington takes a science- and risk-based approach grounded in a thorough understanding of the broad family of PFAS in order to develop a set of recommendations that will address these issues in an appropriate and effective manner.

As drafted, however, the Interim PFAS CAP remains technically inaccurate and fails to identify and focus on the true sources of concern that should be addressed under the CAP. The document attempts to characterize the extremely broad and diverse group of chemicals referred to as "PFAS," which is a group that includes products and substances that are not PBTs and are not relevant to the contamination issues in Washington. Furthermore, the Interim PFAS CAP's repeated and unsubstantiated claims that short-chain PFAS are "regrettable substitutes" for long-chain PFAS is contradicted by the substantial body of data on short-chain PFAS. We again recommend that Ecology and Health refine their focus to a more narrow and appropriate scope addressing long-chain PFAS and related salts only.

[1] FluoroCouncil's member companies are Archroma Management LLC, Arkema France, Asahi Glass Co., Ltd., Daikin Industries, Ltd., Solvay Specialty Polymers, The Chemours Company LLC, Dynax (associate), and Tyco Fire Products LP (associate).

Below is a summary of our comments, and attached are FluoroCouncil's specific comments on the Interim PFAS CAP, which are offered to provide technical accuracy and a more appropriate, focused scope that would support actions to address the PFAS-related issues in Washington.

## A. The PFAS CAP should focus on long-chain PFAS.

### 1. Certain long-chain PFAS have been found in Washington at elevated levels.

The PFAS-related environmental contamination issues currently facing Washington are associated with certain long-chain PFAS, namely PFOS. "Long-chain" and "short-chain" is a distinction that applies to certain PFAS[2] and is recognized by regulators globally.[3] Long-chain PFAS include PFOS, PFOA, and their precursors, including long-chain fluorotelomer-based products.

The distinction between long-chain and short-chain PFAS is not based purely on chemical structure, but also on hazard characteristics, with long-chains having greater toxicity and higher bioaccumulation potential. By contrast, and contrary to the Interim PFAS CAP, a substantial body of data demonstrates that short-chain PFAS chemicals are not bioaccumulative, are not carcinogenic, and generally exhibit low toxicity, which supports the conclusion that short-chain PFAS are not "regrettable substitutes"[4] for long-chain PFAS. Numerous non-polymeric, long-chain PFAS, including long-chain perfluorocarboxylic acids (PFCAs) such as PFOA and long-chain perfluoroalkane sulfonic acids (PFSAs) such as PFOS, have been classified as PBT substances by regulators around the world. PFOS and its salts are the only long-chain PFAS listed as PBTs in Washington.

Through regulation, the EPA PFOA Stewardship Program and other voluntary initiatives, major manufacturers in the U.S., Europe, and Japan, including FluoroCouncil member companies, worked to successfully phase out long-chain PFAS (including precursors), virtually eliminating these chemicals from their products and facility emissions globally.[5] While PFOS, PFOA, and other long-chain PFAS are no longer produced in the U.S., their production has not stopped outside of the US, Europe, and Japan. Production, use, and sale of these substances and products containing them continues by companies that have not made similar stewardship commitments. This allows products containing long-chain compounds to enter into Washington from abroad, potentially leading to continued exposure and environmental contamination.

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[2] Only non-polymeric PFAS and fluorotelomer-based products can be described as long-chain or short-chain. This description is irrelevant to other PFAS, including fluoropolymers.

[3] Long-chain PFAS are defined by the Organisation for Economic Co-operation and Development (OECD) as:

- PFCAs with carbon chain lengths C8 and higher, including PFOA;
- PFSAs with carbon chain lengths C6 and higher, including perfluorohexane sulfonic acid (PFHxS) and PFOS; and
- precursors of these substances that may be produced or present in products.

*See* https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/aboutpfass/.

[4] The Interim PFAS CAP defines a "regrettable substitute" as a "replacement [that] is just as harmful or more harmful than the original." P. 4, Interim PFAS CAP.

[5] As a result of this phase-out, levels of long-chain PFCAs and PFSAs have been declining in U.S. blood levels. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, "Fourth National Report on Human Exposure to Environmental Chemicals," Updated January 2017 https://www.cdc.gov/biomonitoring/pdf/FourthReport_UpdatedTables_Volume1_Jan2017.pdf.

Recent environmental monitoring and product testing in Washington shows continued presence of long-chain PFAS. To appropriately address the PFAS-related contamination issues facing Washington, the CAP should focus on recommendations that would target those long-chain PFAS found at elevated levels in the state and their sources, including products containing those substances.

### 2. The CAP process is designed to address PBT substances.

The regulations that establish and govern the CAP program recognize that PBT substances present unique risk concerns that require a focused regulatory response.[6] Thus, the CAP program is specifically intended to address the presence of PBT chemicals in Washington and to mitigate the human health and environmental risks associated with those PBT substances. It is not intended to address non-PBT substances, such as fluoropolymers and short-chain PFAS.

The regulations also contain a list of specific PBT chemicals (including groups of chemicals), that are to be addressed under the CAP program. This list identifies "toxic chemicals that require further action because they remain ("persist") in the environment for long periods of time where they can bioaccumulate to levels that pose threats to human health and environment in Washington."[7]

The regulations specify that Ecology will select chemicals for CAP development from the PBT list and that any additions to the PBT list will be accomplished through rulemaking after public notice and an opportunity to comment.[8] Thus, in order to align the PFAS CAP with the purpose and intent of the governing regulations, Ecology must focus the CAP specifically on those PFAS chemicals that are PBT substances, including PFOS. Indeed, the only PFAS chemical included on the PBT list in the regulations is the group of chemicals referred to as "Perfluorooctane sulfonates," which is defined to consist of PFOS acid and various salts.[9] Under the express terms of the regulations the PFAS CAP must focus on this listed group of chemicals and cannot be expanded to include the entire universe of PFAS.

### 3. It is not appropriate to include other PFAS in the CAP.

In order to achieve the policy objectives of the CAP program, as spelled out in the regulations, Ecology should focus its efforts on substances that are PBTs, such as PFOS and PFOA. Other categories of PFAS, including fluoropolymers and short-chain PFAS, should not be included in the PFAS CAP because they are not PBTs and they are unrelated to the contamination issues facing Washington.

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[6] "Persistent, bioaccumulative toxins (PBTs) are chemicals that pose a unique threat to human health and the environment in Washington State. . . . Because of the unique threat that these PBTs pose, special attention is necessary to identify actions that will reduce and eliminate threats to human health and the environment. . . . The goal of [these CAP regulations] is to reduce and phase-out PBT uses, releases and exposures in Washington." WAC § 173-333-100.
[7] *Id* at § 173-333-300.
[8] *Id*. at §§ 173-333-300 and 173-333-340.
[9] *See* WAC § 173-333-310.

Because fluoropolymers are too large to be bioavailable, they are neither toxic nor bioaccumulative. Their chemical structure and high stability under all types of environmental conditions means they are not precursors to any PFCAs or PFSAs. Therefore, they should be removed from the scope of PFAS included in the CAP. Discussion of fluoropolymers and their uses is not appropriate for the PFAS CAP.

Short-chain PFAS, including short-chain PFCAs, short-chain PFSAs, and their precursors, should also be excluded from the scope of the PFAS CAP. Short-chain PFAS offer similar or superior product performance as long-chain PFAS, but with improved environmental and biological profiles. These short-chain PFAS have been reviewed and approved for use by regulators around the world based on extensive toxicological and environmental testing. The extensive body of research supporting short-chain PFAS shows that, unlike their long-chain counterparts, they are not PBTs, and consequently not "regrettable substitutes." Furthermore, they are not precursors for long-chain PFAS and are not contributing to the long-chain contamination issues in Washington. Therefore, short-chain PFAS should also not be within the scope of the PFAS CAP.

**B. PFAS cannot be addressed as a broad class.**

PFAS includes a wide variety of chemical substances and polymers with very diverse properties. The term "PFAS" simply means that a substance is highly fluorinated. "PFAS" is too general to be useful for communication purposes and is insufficient to describe a regulatory class. Because there is so much variation among the alleged 4,700+ chemicals in the PFAS category,[10] no scientifically sound rationale exists for treating them all the same as a matter of public policy.

PFAS vary significantly in their hazard profiles. As discussed above, certain PFAS have been classified as PBTs. However, not all PFAS and related products are persistent, bioaccumalative, and/or toxic, particularly at concentrations typically present in the environment. While some PFAS remain in the environment for years, other PFAS are short-lived and convert to other substances in a matter of hours or days. Not all PFAS persist in biological tissues. While some long-chain PFAS have half-lives in humans that extend for years, other PFAS compounds, including short-chains, are readily eliminated and do not bioaccumulate.[11] Kinetics studies in animals further demonstrate that the persistence of PFAS compounds decreases with decreasing chain length.[12]

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[10] *See* OECD, Summary Report on Updating the OECD 2007 List of Per- and Polyfluoroalkyl Substances (PFASs), www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV-JM-MONO(2018)7&doclanguage=en.

[11] Chengelis C.P., J.B. Kirkpatrick, N.R. Myers, M. Shinohara, P.L. Stetson, and D.W. Sved. 2009a. Comparison of the toxicokinetic behaviour of perfluorohexanoic acid (PFHxA) and nonafluorobutane-1-sulfonic acid (PFBS) in cynomolgus monkeys and rats. Reprod Toxicol, 27(3-4):342-351. Gannon S.A., T. Johnson, D.L. Nabb, T.L. Serex, R.C. Buck, S.E. Loveless. 2011. Absorption, distribution, metabolism, and excretion of [1-14C]-perfluorohexanoate ([14C]-PFHx) in rats and mice. Toxicology, 283: 55–62. Iwai H. 2011. Toxicokinetics of ammonium perfluorohexanoate. Drug and Chem. Toxicol. 34: 341–346.

[12] Chang S-C, K. Das, D. Ehresman, M.E. Ellefson, G.S. Gorman, J.A. Hart, P.E. Noker, Y-M Tan, P.H. Lieder, C. Lau, G.W. Olsen, and J.L. Butenhoff. 2008. Comparative pharmacokinetics of perfluorobutyrate in rats, mice, monkeys, and humans and relevance to human exposure via drinking water. Tox. Sci. 104: 40-53. Kudo, N., E. Suzuki-Nakajima, A. Mitsumoto, and Y. Kawashima. 2006. Responses of the liver to perfluorinated fatty acids with different carbon chain length in male and female mice: In relation to induction of hepatomegaly, peroxisomal beta-oxidation and microsomal 1-acylglycerophosphocholine acyltransferase. Biol. Pharm. Bull. 29:1952–57. Ohmori, K., N. Kudo, K. Katayama, and Y. Kawashima. 2003. Comparison of the toxicokinetics between perfluorocarboxylic acids with different carbon chain length. Toxicology 184:135–40.

All PFAS also do not share a common toxicity profile. For example, toxicity testing on some PFAS substances shows carcinogenic potential (e.g., PFOA) while similar testing on other substances (e.g., PFHxA) does not show any evidence of carcinogenicity.[13] In addition, even when toxicity testing of PFAS substances may show some similarity of effects, the doses associated with those effects can vary by orders of magnitude from substance to substance.[14]

Sound science dictates that when multiple chemicals have differing toxicity characteristics, they cannot be grouped together for risk assessment purposes.[15] Given the wide variations in toxicities and other hazard characteristics exhibited by different PFAS chemicals, it is scientifically inappropriate to group all PFAS together for purposes of risk assessment, as the Interim PFAS CAP currently does.

The broad family of PFAS includes some substances that have been developed and are actually used in commercial applications; however, a large number have not been developed and not all PFAS compounds cited in the OECD report are items in commerce. Additionally, it is important to understand that those PFAS with commercial uses are not used interchangeably. Different PFAS impart different properties, and those in the marketplace have been designed for specific uses, making it essential for public policy to be based on the risks associated with exposure to individual substances in particular uses. For example, fluoropolymers are not used to make grease-resistant food wrappers, and fluorotelomers are not used to make plastic parts. Consequently, the life-cycle impact of any particular compound within the PFAS category can differ by orders of magnitude.

As a result of this significant diversity within the family of PFAS, it is inappropriate to address PFAS as a broad class. Rather, regulatory and policy measures should be substance-specific.

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FluoroCouncil understands Washington's need to address the PFAS-related contamination issues in the state. It is critical that the approach taken to address those issues be focused on the chemicals found at elevated levels that are within the scope of the CAP process (PBTs): long-chain PFAS.

FluoroCouncil welcomes the opportunity to work with the departments to refine the Interim PFAS CAP to ensure it results in a targeted set of recommendations supported by a scientifically sound foundation.

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[13] Klaunig, J.E., M. Sinohara, H. Iwai, C. Chengelis, J. Kirkpatrick, Z. Wang, and R. Bruner. 2015. Evaluation of the chronic toxicity and carcinogenicity of perfluorohexanoic acid (PFHxA) in Sprague-Dawley rats. Tox. Pathology 43:209-220.

[14] ATSDR. 2015. Draft toxicological profile for perfluoroalkyls. Agency for Toxic Substances and Disease Registry. U.S. Department of Health and Human Services Public Health Service, August.

[15] As OECD notes, equating the risks of various chemicals for which there are known differences in toxicity is not "scientifically warranted." *See* http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2014)4&doclanguage=en at 18. Similarly, if analysis of one chemical using information about another does not create "an accurate and credible assessment of the hazards for the substance in question," then it is inappropriate to read-across between the substances. http://www.ecetoc.org/wp-content/uploads/2014/08/ECETOC-TR-116-Category-approaches-Read-across-QSAR.pdf at 44.

Sincerely,

Jessica S. Bowman
Executive Director

Enclosures:

- Interim Chemical Action Plan for Per- and Polyfluorinated Alkyl Substances with FluoroCouncil Comments