UNIVERSITY OF NOTRE DAME
Department of Physics

TESTIMONY

To: Chairwoman Pendergrass and members of the House Health and Government Operations Committee
From: Graham F. Peaslee, Professor of Physics
Date: March 2, 2022
Re: Support for House Bill 570: Pesticides – Mosquito Control Products and PFAS Chemicals

I am a Professor of Physics at the University of Notre Dame, and my research interests for the past 10 years have centered on developing novel analytical methods to measure chemicals of concern in the environment. In my **35-year career I have 228 peer-reviewed publications, including 19 on the topic of measuring PFAS** and their fate and transport in the environment, and **one patent on a "method for detecting fluorinated chemicals in liquid". I am a co-author of the Madrid Statement on The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)** which is dedicated to the reduction in our non-essential use of these "forever chemicals" in our society.

First, I would like to applaud Delegate Stein, the sponsor, of this bill on recognizing a truly non-essential use of PFAS that will certainly allow these persistent, bioaccumulative and toxic class of chemicals to enter the environment. As will be attested to by other experts such as Dr. Birnbaum, **the release of these chemicals directly into the environment in Maryland would have long-term negative health impacts on the citizens who live there. The use of PFAS in mosquito-control pesticides hardly fits the definition of essential use** – they are either put there intentionally as "dispersal aids" or unintentionally as by-products of the process to make the pesticide containers chemically resistant. The fact that equivalent pesticides exist without any intentional or unintentional PFAS in them means that **they are not essential in either the manufacture or the use of these mosquito control products**. There must already be better alternatives commercially available for this use, and I would argue that any equivalent insecticide that is PFAS-free would be a better long-term solution.

Second, I would like to point out that for most commercial uses of PFAS[1], is that there are over 1400 different PFAS known to be used. In addition, chemical modification, including oxidation, exposure to environmental factors such as UV light exposure biological processes can alter some of the larger PFAS into some of the other 12000 known PFAS varieties know to the EPA[2]. These forms of PFAS are known as "precursors", because after exposure to environmental conditions or biochemical conditions within the body, these chemicals can be transformed into the very long-lived PFAS such as PFOA and PFOS. **For this reason, it is also important to conduct testing for total organic fluorine as a surrogate for all PFAS**. **This type of test is what we have pioneered in our academic lab**[3,4], although it is now available from several commercial laboratories in the US, and it is important to realize that **it is a lower-cost test that can check for the presence of all PFAS – even those that have yet to be declared in product**s. **If a total organic fluorine measurement indicates no fluorine present, then there cannot be any PFAS**

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present – either in its known forms or the thousands of unidentified pre-cursor forms. Thus, this bill's provision to test not only for commonly identified forms of PFAS (such as PFOA and PFOS), but also total organic fluorine will prevent loopholes in the analytical measurements that could allow the spread of PFAS into the environment.

Finally, the last excellent stipulation in this bill is the need for explicit testing for any specific chemical to be released into the environment. There are several conventional tests that can be performed to ascertain the presence and absence of PFAS in commercial products. The most sensitive tests are those performed with liquid-chromatography/mass spectrometry, which are readily available from a variety of commercial and state laboratories. These tests can detect 30 or more of the most common PFAS at concentrations down to part-per-trillion levels, and they can specify which PFAS are present. This is especially important since the current health advisory limit from the EPA sets drinking water standards for just two of these compounds (PFOA and PFOS) at 70 parts per trillion. Thus, the presence of these specific PFAS can be verified by this routine commercial testing. This is an essential stipulation in the bill, as it will hold manufacturers accountable to prove that the products they sell are truly PFAS-free.

I give my support to Maryland house bill 570, and as my parents were long-time residents of Maryland, I am proud to see its legislature taking a proactive stance to protect the residents of Maryland from adverse health effects of PFAS reaching the environment.

References:

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2. EPA Masterlist of PFAS Chemicals: https://comptox.epa.gov/dashboard/chemical-lists/PFASMASTER (accessed 2/25/2022).
3. Ritter, E.E., Dickinson, M.E., Harron, J.P., Lunderberg, D.M., DeYoung, P.A., Robel, A.E., Field, J.A. and Peaslee, G.F., 2017. PIGE as a screening tool for Per-and polyfluorinated substances in papers and textiles. Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, 407, pp.47-54.
4. Robel, A.E., Marshall, K., Dickinson, M., Lunderberg, D., Butt, C., Peaslee, G., Stapleton, H.M. and Field, J.A., 2017. Closing the mass balance on fluorine on papers and textiles. Environmental science & technology, 51(16), pp.9022-9032.

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