STATE OF NEW MEXICO
ENVIRONMENTAL IMPROVEMENT BOARD

IN THE MATTER OF PROPOSED
ADOPTION OF 20.13.2 NMAC –
Per- and Poly-Fluoroalkyl Substances in Consumer Products **No. EIB 25 - 61(R)**

NEW MEXICO ENVIRONMENT DEPARTMENT
REBUTTAL TESTIMONY OF DR. ERIC J. CHAPMAN

My name is Eric J. Chapman, and I serve as the Chief Science Coordinator for the Office of Strategic Initiatives housed in the Office of the Secretary of the New Mexico Environment Department ("NMED" or "Department"). I present this written rebuttal testimony on behalf of the Department in this proceeding in support of the Department's Rebuttal Revised Proposed New Rule 20.13.2 NMAC, **NMED Exhibit 69** (clean) and **NMED Exhibit 70** (redline; "Rebuttal Rule"). My curriculum vitae setting forth my education and qualifications is part of the rulemaking record as **NMED Exhibit 4**, which are also summarized in my direct testimony, which is part of the rulemaking record as **NMED Exhibit 3**.

The purpose of my rebuttal testimony is to: 1) provide the Environmental Improvement Board ("EIB") with an overview of revisions in the Rebuttal Rule that the Department has made to the Revised Proposed New Rule since filing on January 16, 2026, and 2) address environmental science and environmental health claims in the direct written testimony provided by two experts for the Complex Products Manufacturers Association (CPMC) and one expert for the American Chemistry Council (ACC).

More specifically, I will: 1) describe how the Department has continued to meet and

collaborate with interested parties since filing the Revised Proposed New Rule on January 16, 2026; 2) highlight how engagement with interested parties led to the development of the Rebuttal Rule for the EIB's consideration; and 3) summarize how environmental health and environmental science claims made by experts for CPMC and ACC are limited, narrow, and over-simplifications of the true environmental impact of consumer products containing intentionally added per- and polyfluoroalkyl substances (PFAS).

In my direct written testimony, I provided an overview of the sources, transformation, transport, and fate of PFAS in the environment. I highlighted: 1) primary sources of PFAS in the environment including commercial production, industrial activities, aqueous film-forming foam use, and consumer products; 2) major secondary sources of PFAS in the environment including wastewater treatment plants (WWTP), landfills, and land application of biosolids; 3) how PFAS undergo biogeochemical and abiotic transformations through various environmental media including water, soil, and air; 4) how PFAS are transported through these same environmental media; and 5) how "terminal" PFAS resulting from these biotic and abiotic transformations of "precursor" PFAS are frequently the ultimate chemical fate of PFAS in the environment.

I. The Department Continues to Engage with Interested Parties and Presents the Rebuttal Rule for the EIB's Consideration

Since filing the Revised Proposed New Rule, the Department has continued to engage with interested parties leading up to the rulemaking hearing. All told, the Department has met with more than 56 interested parties and 99 representatives from those

interested parties since August 2025.

The ongoing meetings with interested parties have resulted in the Rebuttal Rule that the Department presents for the EIB's consideration. The Rebuttal Rule includes several important revisions including the removal of a link to the Department's website in Section 20.13.2.13 on labeling of consumer products and the addition of specific and clear instructions for a required symbol to label consumer products containing intentionally added PFAS. By removing the links to the Department's website, the Rebuttal Rule removes interested party concern about potential compelled speech arguments.

II. Environmental Impact of a Consumer Product Containing Intentionally Added PFAS from a Complete Life Cycle Assessment Framework

Through my review of the scientific literature presented in my direct testimony on sources, transformation, transport, and fate of PFAS in the environment, I provided a comprehensive overview of potential avenues of environmental PFAS exposure. The overall message of my direct testimony was that to understand and appreciate the full environmental impact of PFAS in a consumer product — including complex durable goods — containing intentionally added PFAS, one must adopt a complete life cycle "cradle to grave" mindset. For example, there are both direct — use of consumer products — and indirect — through the environment — pathways for humans to be exposed to PFAS from consumer products.

Ultimately, PFAS of all kinds in consumer products are subject to numerous biogeochemical and abiotic transformations in the environment; transformations of so-

called precursor PFAS to the highly concerning terminal PFAS — perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) — are well-documented in the scientific literature and should be expected to readily occur. If one were to adopt a narrow view of PFAS exposure as only being through the direct use of a consumer product, one would severely underestimate how much PFAS exposure consumers actually receive. By adopting a cradle to grave mindset, one can assess the full environmental impact and exposure through the production, use, and disposal of a consumer product containing intentionally added PFAS.

Furthermore, this cradle to grave life-cycle assessment perspective highlights how removing intentionally added PFAS from consumer products is the only way to truly turn off the spigot of PFAS in New Mexico. By stemming the upstream flow of PFAS through the prohibitions of consumer products containing intentionally added PFAS, the burden of PFAS on downstream passive receivers such as WWTPs and landfills can be lessened. For instance, in my direct testimony (**NMED Exhibit 3**) I referenced several scientific studies that investigated the concentrations of PFAS in WWTP effluent, landfill leachate, and landfill aerosol emissions (e.g. Barisci and Suri 2021; Fredriksson *et al.* 2022; De la Cruz *et al.* 2025). These facilities receive PFAS passively from sources such as consumer products and further spread PFAS contamination through no fault of their own. Dr. Ling's direct written testimony (**NMED Exhibit 32**) provides the astronomical cost to remove environmental PFAS contamination that are likely to tax our largely under resourced and rural water treatment systems (see Beisner *et al.* 2024). To curb environmental contamination from PFAS in New Mexico we must implement the PFAS Protection Act and stem the flow of PFAS into the environment through consumer

products. As the Rebuttal Rule and Dr. Dickerson's direct written testimony provide, educating consumers of the presence of PFAS in consumer products through labeling is an important element of reducing PFAS contamination in New Mexico.

III. Direct Testimony of Experts from Complex Products Manufacturers Coalition is Sparce, Overly General, and Ignores Environmental Realities

A. Expert testimony from Dr. Alex Stanton (**CPMC Exhibit 1**) representing CPMC was anchored by two headings over four pages of total testimony and largely focused on how "*PFAS is a variable term encompassing many critical-use chemicals with a wide range of properties*" and "*The proposed regulations are not scientifically accurate. Requiring a label that communicates hazard for all PFAS in the definition is overly broad.*"

In the first paragraph of the first section, Dr. Stanton provides an overview of PFAS chemistry and highlights the carbon-fluorine bond strength and how PFAS are often characterized as persistent, bioaccumulative, and toxic. Dr. Stanton then states: *"…it does not follow that as a class they are harmful, nor that they are "forever" chemicals.*" First, this statement seeks to minimize concerns with respect to PFAS by conflating a commonly used phrase in the popular press with the biochemical reality that PFAS are subject to degradation and are not truly forever. On the contrary, and as I provided in my direct testimony, PFAS are subject to a multitude of biotic and abiotic transformation reactions in the environment that can ultimately convert precursor PFAS into terminal PFAS such as PFOA and PFOS. Second, this statement implicitly acknowledges the possibility of PFAS degradation and that PFAS are subject to these very transformations. Third, it ignores that

as a *class* PFAS do have shared characteristics such as *persistence*, meaning that PFAS contamination is long-lasting and difficult to remediate. At the bottom of the first paragraph Dr. Stanton states: "*Chemicals with few or a single carbon-fluorine bond do not necessarily possess the same physico-chemical properties as known pollutants PFOS or PFOA, each of which have eight fully fluorinated carbons (resulting in either 15 or 17 carbon-fluorine bonds in total).*" This quote ignores that all PFAS are persistent and it also seeks to minimize that short-chain PFAS have detrimental characteristics such as high mobility in the environment. Further, the combination of high mobility and high persistence means that short-chain PFAS contamination occurs quickly and is long-lasting.

In the second paragraph of direct testimony, Dr. Stanton pivots to fluoropolymers, stating: "*fluoropolymers could be considered an entirely separate entity from "PFAS" when considering physico-chemical properties.*" As I mentioned in my direct testimony, I explicitly highlight the existence of the statutory definition of PFAS in the PFAS Protection Act to address this common assertion. From the text of HB 212: "'per- or poly-fluoroalkyl substance' means a substance in a class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom." By the definition provided by the PFAS Protection Act, fluoropolymers are PFAS not "an entirely separate entity." Furthermore, we must consider more than just "physico-chemical properties" of PFAS; the environment and human bodies certainly do. Completely ignoring the biology of PFAS by only focusing on physico-chemical properties presents an incredibly narrow analysis.

Dr. Stanton continues: "*Their size, stability, and chemical properties leave fluoropolymers insoluble in water,* ***presenting very low or no risk of contamination to the***

environment*. This also means fluoropolymers are not bioaccumulative, and common fluoropolymers such as PTFE remain intact well above 1000° Fahrenheit,* ***significantly reducing chances of unfavorable degradation in the environment.****"* Putting aside the inaccuracy of Dr. Stanton's argument that chemical insolubility in water means that they cannot contaminate the environment (see microplastics, for example), this assertion demonstrates why polymeric PFAS such as fluoropolymers *persist* in the environment, which represents a large environmental burden and ultimately serves as a reservoir of fluoropolymer degradation products in the environment (Lohmann and Letcher 2023).

Dr. Stanton conveniently and narrowly focuses on only one type of polymeric PFAS and ignores the potential for another type of polymer to be a source of PFAS in the environment (Figure 1). For instance, side-chain fluorinated polymers (SCFPs), can release their perfluorinated side-chains and can degrade into the persistent non-polymeric group of perfluoroalkyl acids (PFAA), which contain the most well characterized and concerning PFAS of PFOA and PFOS (Rankin *et al.* 2014; Washington *et al.* 2015).

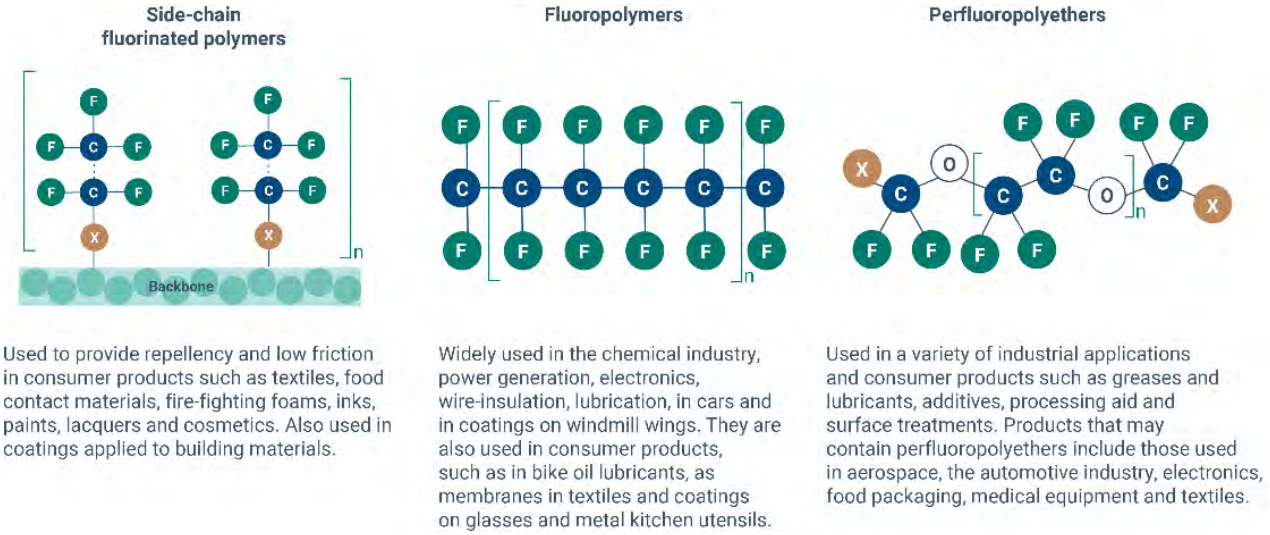

Figure 1. What are PFAS polymers and what are they used for? From the European Environment Agency April 2025 Briefing.

This claim also ignores that fluoropolymer production is a major source of PFAS emissions to the environment (Miller *et al.* 2025). Fluoropolymer production PFAS emissions can contaminate the air, soil, and water (Figure 2). During production, PFAS such as PFOA and perfluorononanoic acid (PFNA) were used until 2015 as fluoropolymer processing aids. Fluoropolymer producers have replaced PFOA and PFNA with similar chemicals such as hexafluoropropylene oxide dimer acid (HFPO-DA, or Gen-X), which also has known toxic effects. This disingenuous claim narrowly focuses on the idea that there is no PFAS exposure through their direct use because of the high thermal stability and the insolubility of fluoropolymers, completely ignoring PFAS emitted in the environment in the production phase in the life cycle of a fluoropolymer (Figure 2).

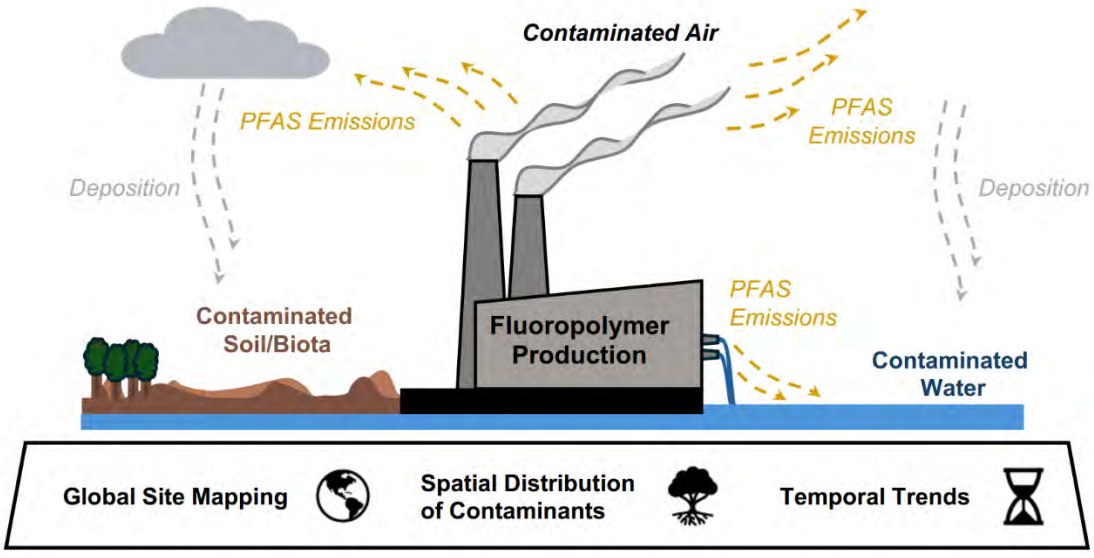

Figure 2. Emissions and subsequent environmental contamination associated with fluoropolymer production (Figure from Miller et al. 2025).

As a testament to the mounting concerns with PFAS, particularly with respect to persistence, the European Chemicals Agency (ECHA) is moving forward with a proposal to restrict *all* PFAS as a *class* under the Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH) Regulation in the European Union (EU). This proposal uses a life cycle approach to evaluate indirect and direct effects of PFAS and seeks to restrict around 10,000 PFAS. In 2026, the opinions of ECHA's Risk Assessment Committee (RAC) and the Committee for Socio-Economic Analysis (SEAC) will be sent to the European Commission for the final vote expected in 2027. The PFAS restriction legislation emerging from the ECHA of the EU demonstrates that there is sufficient concern to regulate PFAS as a class, directly contradicting Dr. Stanton's assertion that "*it does not follow that as a class they are harmful."*

The second half of Dr. Stanton's testimony (2 pages) focuses on the claim that *"The proposed regulations are not scientifically accurate. Requiring a label that communicates hazard for all PFAS in the definition is overly broad."* Dr. Stanton provides no evidence or citations to support the first sentence of this quote throughout her short testimony. Furthermore, Dr. Stanton's testimony was written and filed prior to the Department filing the Revised Proposed New Rule or the Rebuttal Rule, which incorporates considerable feedback from interested parties with respect to the labeling program. Most notably, the Department removed language concerning health or environmental effects of PFAS from the label. In the Rebuttal Rule for the EIB's consideration, the label program instead requires a simple symbol of an Erlenmeyer flask outline with the word "PFAS" inside with optional, short, non-controversial statements of facts such as "Contains PFAS" or "Made with PFAS" adjacent to the symbol. This eliminates the argument from Dr. Stanton's

testimony that "*requiring all PFAS-containing products to include a label suggesting that they pose such risks is inaccurate, or at the very least the subject of ongoing scientific research and debate – as even the Fiscal Impact Report to HB 212 acknowledges.*" In this same sentence, Dr. Stanton provides an erroneous interpretation of a citation to the Fiscal Impact Report (FIR) to HB 212. In the footnote of the citation for this sentence Dr. Stanton quotes: "There is currently no consensus on a safe level of PFAS." The full context of the quote is provided from the HB 212 FIR here: "There is currently no consensus on a safe level of PFAS. According to analysis from DOH, PFAS exposure in humans has been linked to various health issues. While research continues to find how varying levels of exposure and their link to certain health effects, there is consensus regarding high levels of PFAS in humans leads to health issues such as:

- Reproductive effects such as decreased fertility or increased high blood pressure in pregnant women;
- Developmental effects or delays in children, including low birth weight, accelerated puberty, bone variations, or behavioral changes;
- Increased risk of some cancers, including prostate, kidney, and testicular cancers;
- Reduced ability of the body's immune system to fight infections, including reduced vaccine response;
- Interference with the body's natural hormones
- Increased cholesterol levels and/or risk of obesity"

Given the whole context of the quote, a more proper interpretation of this quote is there no level of exposure to PFAS that can be considered safe.

The Rebuttal Rule eliminates the argument that Dr. Stanton makes in the last paragraph of testimony: "*The labeling requirement would require PFAS-containing products to link to the NMED's website, which states that 'PFAS exposure has been linked in human studies to increased risks of kidney and testicular cancers, changes in liver function, thyroid disease, elevated cholesterol, pregnancy complications (including gestational hypertension and preeclampsia), lower birth weight, and impacts on the immune system such as reduced vaccine antibody response.' This overgeneralization cannot be fully supported with scientific evidence when there are thousands of PFAS substances, ranging from volatile gases to heavy, insoluble polymers, and only a small subset of PFAS out of these thousands have been associated with negative effects."* As I mentioned above, the Rebuttal Rule removed links to the Department's website.

The concern expressed in the last sentence of Dr. Stanton's testimony is also eliminated with the statement of facts labeling program described in the Rebuttal Rule: "*A label communicating hazard from PFAS in such devices would not be supported by the best available scientific evidence.*" The Department incorporated feedback from interested parties about the labeling language and modified the approach to address these concerns in the Rebuttal Rule, by removing any language that communicates a hazard.

Dr. Stanton also discusses the impact of labeling complex durable goods: "*The PFAS in these internal vehicle components serve important functions in the operation and safety of the vehicle, but under the labeling requirement, a car manufacturer would generally* ***still have to label the vehicle*** *as if it contained consumer-facing PFAS that posed a risk of harm to human health,* ***even though the driver would not be exposed to PFAS and the hazards***

of such materials are unclear but generally considered low to none." First, the Rebuttal Rule does not require the vehicle to be labeled, only the owner's manual. Second, Dr. Stanton adopts the perspective (with no citations) that because a product is a complex durable good with internal components, that it contains no consumer-facing PFAS that could expose the driver to PFAS (such as vehicle seats). Third, the spirit of the labeling program is to provide consumers with information to choose whether they would like to reduce their exposure to PFAS in consumer products. The Department believes that a consumer's exposure to PFAS from consumer products extends beyond the immediate and direct use of the product; instead, the cradle to grave perspective afforded by a life cycle assessment considers the production, use, and disposal of that product.

B. Like the testimony of Dr. Stanton, the testimony of Ms. Marrapese for the CPMC provides assertions about the Revised Proposed Rule and environmental science that I would like to address. Ms. Marrapese makes assertions and attempts to minimize the risks associated with intentionally added PFAS in consumer products. Ms. Marrapese makes the following assertions *without citations*, among others (emphasis added)*:*

1. *"The internal component parts are almost always encased in the product interior, which means that they are not accessible to consumers* ***and have little to no risk of exposure****." Id. at 2.*
2. *"The ingredients in hardened exterior coatings are chemically bound to prevent direct exposure or release during their intended use."* ***Id.***
3. *"Therefore, requiring labeling for 'PFAS' for a broad range of products, implying*

that thousands of chemicals captured by the definition could pose a danger to consumers does not result in any benefit and would give consumers a false sense of making an 'informed decision' ***to evade a level of risk that does not exist****." Id.*

4. *"PFAS that do not come into contact with humans and are not released into the environment because they are fully contained* ***are likely to be less risky*** *than PFAS contained in products that are directly handled by consumers or introduced into waterways." Id. at 7.*
5. *"Most of the PFAS found in complex durable goods are contained in internal components that do not come into contact with consumers and* ***in many cases are fluoropolymers that do not present a risk*** *of environmental contamination." Id.*
6. *"As such, the complex durable goods exempted from reporting and* ***bans are low risk****." Id.*
7. *"...these substances are typically not present in complex durable goods and would not present* ***in a manner that contributes to that risk****." Id. at 8.*

I will begin by directly addressing the first, second, fourth, sixth, and seventh assertions above. Ms. Marrapese generalizes across all complex durable goods that components are sequestered inside, removed from consumer exposure, and locked away from environmental release. First, this assumes that PFAS are only contained in internal components of complex durable goods, a questionable claim that was not supported by citations. Second, this completely ignores the direct and indirect exposure and environmental contamination pathways from PFAS through material recycling from consumer products containing intentionally added PFAS.

Additionally, as I provided in my direct testimony, electronic waste can be a significant source of PFAS exposure to humans as well as to the environment (Tansel 2022). For instance, Tansel (2022) highlights how electronic waste handling and processing facilities are linked with environmental PFAS contamination in water, soil, leachate, human blood, and rainwater. Furthermore, Bulson *et al.* (2023) review the end of life circulation of PFAS in metal recycling from automobiles. They reviewed the literature on vehicle recycling — one example of a complex durable good — and how PFAS concentrations in automobile shredder residue can range from 3 µg/kg in fine particles to over 5,100 µg/kg in coarse particles. They also found PFAS concentrations in stormwater related to vehicle recycling to range from 130 ng/L to 520 ng/L, representing similar levels of contamination observed in the groundwater near the Army Aviation Support Facility, a site of aqueous film-forming foam (AFFF) use, in the communities of La Cienega and La Cieneguilla in Santa Fe County (**NMED Exhibit 68**).

Ms. Marrapese's first, second, fourth, sixth, and seventh assertions above fail to acknowledge the complete environmental impact of consumer products that contain intentionally added PFAS and present an overly simplistic view that exposure to PFAS only occurs with the direct use of the product. Ms. Marrapese's fifth claim is addressed in my rebuttal of Dr. Stanton's testimony with respect to potential hazards of fluoropolymers. Additionally, Ms. Marrapese narrowly focused on fluoropolymers and ignored another polymeric PFAS, SCFP, and their potential degradation which can lead to the generation of PFAA, a group of PFAS that contain PFOA and PFOS.

Next, I will address Ms. Marrapese's third and fifth assertion above. First, following

dozens of meetings with interested parties (**NMED Exhibit 13**), the Department revised the Proposed New Rule. The Department removed any language with respect to health and environmental exposure and the associations with health outcomes. In the Rebuttal Rule, the Department proposes to require a symbol of an outline of an Erlenmeyer flask with the word "PFAS" inside the flask. Directly adjacent to the flask are optional non-controversial statements of fact such as "Made with PFAS" or "Contains PFAS." This label revision honors the statutory definition and simply states whether a consumer product contains intentionally added PFAS and mirrors language adopted by Connecticut and Colorado (**NMED Exhibit 72**). Simply put, the Department has heard concerns from interested parties and has revised the labeling approach to use language similar to Colorado and Connecticut labeling programs for consumer products containing intentionally added PFAS.

All told, Ms. Marrapese claims without evidence or citations that PFAS in complex durable goods: "*are not accessible to consumers and have little to no risk of exposure,*" "*are not released into the environment because they are fully contained,*" "*do not present a risk of environmental contamination,*" "*would not present in a manner that contributes to that risk.*" These claims are easily refuted by a thorough and rigorous examination of the environmental science literature on PFAS that I provided in my direct testimony (**NMED Exhibit 3**). Indeed, the only way to fully understand the environmental impact and potential environmental PFAS exposure pathways of a consumer product, including complex durable goods, is to evaluate the direct and indirect exposure through the production, use, and disposal of that product.

IV. Direct Testimony of an Expert for the American Chemistry Council Makes Erroneous Claims that the Department Treats all PFAS the Same, Narrowly Focuses on Fluoropolymers, and Does Not Tell the Whole Story of Polymeric PFAS.

The 3-page direct testimony of Dr. Stephen Korzeniowski (**ACC Exhibit 2**), an organic chemist for PFAS manufacturer DuPont "for the majority" of his career, focuses mainly on the claim that the proposed rule treats all PFAS the same. Dr. Korzeniowski's main argument is contained in the following sentence: *"The proposed rule would require that all products, including those exempt from the reporting and currently unavoidable use provisions of the law, bear a warning label, which implies that all types of PFAS and all types of products containing intentionally added PFAS present similar concerns."* First, it is clear from the exemptions provided in the PFAS Protection Act that not all PFAS are to be treated the same. Some consumer products are prohibited in 2027, some in 2028, some in 2032, and some are exempt altogether. In fact, there are 16 enumerated exemptions provided by statute. Second, the PFAS Protection Act and the Rebuttal Rule provides a pathway for the Currently Unavoidable Use (CUU) of PFAS in consumer products. Third, the proposed labeling provision in the Rebuttal Rule is not "a warning label." Instead, as mentioned above, the Rebuttal Rule specifies that non-controversial statements of fact adopted by other states such as "Made with PFAS" or "Contains PFAS" may be used to label consumer products. Fourth, the inclusion of a label such as "Made with PFAS" across all types of consumer products does not imply that all types of PFAS present similar concerns. It is merely a statement of fact and a piece of information that consumers can choose to incorporate into their purchasing decisions, use of the product, and disposal of the product.

As I outlined in my direct written testimony, once released into the environment PFAS are subject to a multitude of biological and abiotic transformation processes, with the end result that many PFAS can be converted to the most concerning PFAS, PFOS and PFOA. The implication is not that all PFAS are the same, but that there is the potential for direct and indirect environmental exposure to PFAS. Additionally, the PFAS that a consumer is directly exposed to during the use of the product could be different than the PFAS that they are exposed to indirectly in the environment.

The rest of Dr. Korzeniowski's testimony focuses on a short 6-point list of reasons "that all PFAS are not the same." Many of these points are quotes from organizations, state and federal agencies and the Department does not rebut these statements. I will provide a point-by-point rebuttal of the assertions that Dr. Korzeniowski provides as evidence that the Department treats all PFAS the same. The first point Dr. Korzeniowski mentions is a 2-sentence reference to an "Anderson et al." study in which he provides no year of publication, footnote, or citation. There is no proper way to rebut this assertion without more context.

The second point in Dr. Korzeniowski's list narrowly focuses on fluoropolymers and cites the same two industry studies that I highlight in my direct written testimony: "Many of the early peer-reviewed studies stating that fluoropolymers should be considered "polymers of low concern" are authored by representatives from fluoropolymer production companies such as W.L. Gore and The Chemours Company and contain disclaimer and conflict of interest statements (e.g. Henry *et al.* 2018; Korzeniowski *et al.* 2023)." From Dr. Korzeniowski's testimony: "Two peer-reviewed scientific papers, one for which I was the primary author, demonstrate that fluoropolymers, a specific subset of PFAS, meet criteria

that can be used to identify polymers of low concern for human health or environment." Dr. Korzeniowski adds: "Fluoropolymers are neither bioavailable nor bioaccumulative and do not transform into non-polymeric PFAS in the environment."

First, low concern is not no concern and this argument ignores that polymeric PFAS — such as fluoropolymers — released into the environment still constitute environmental PFAS contamination. As I mentioned above in my rebuttal to Dr. Stanton's testimony, at the very least this represents a source of highly persistent contamination that could serve as a reservoir of fluoropolymer degradation products in the environment. Second, regulatory bodies are beginning to acknowledge the body of science that I cite above with respect to the potential of other types of polymeric PFAS — such as SCFPs — to degrade into more concerning groups of non-polymeric PFAS (and fluoropolymers are not the only polymeric PFAS, see Figure 1).

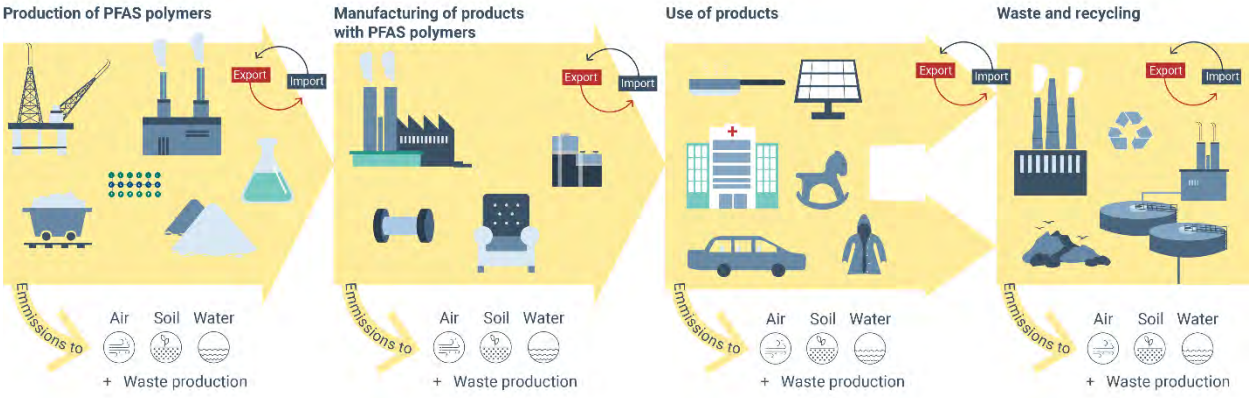

Figure 3. Potential emissions pathways of PFAS through the production of PFAS polymers, manufacturing of products with PFAS polymers, use of the product, and waste and recycling of the product (From the European Environment Agency).

Third, regulatory agencies are also increasingly acknowledging that to better protect consumers, the totality of potential PFAS exposure and environmental release must be considered throughout the production of PFAS polymers, manufacturing of products with PFAS polymers, use of the product, and waste and recycling of the product (Figure 3). For instance, in a 2025 briefing, the European Environment Agency states: "Although the synthesis of PFAS polymers takes place in closed systems, evidence shows that emissions of non-polymeric PFAS can occur all along the life cycle. They can be emitted at all stages, from ingredient production to producing the polymer; from reshaping it into a product to the product's use, from its recycling or reuse of the product to its disposal by land filling or incineration. The resulting pollution has spread widely and has accumulated in water, air, soil, people, biota and food" (https://www.eea.europa.eu/en/analysis/publications/pfas-polymers-in-focus?activeTab=6397c084-2e5f-4545-a873-f99323d40846). This statement and the work of Rankin *et al.* (2014), Washington *et al.* (2015), and Lohmann and Letcher (2023) illustrate that Dr. Korzeniowski's selective focus on the risk of PFAS from fluoropolymers does not paint the whole picture of how polymeric PFAS emits non-polymeric PFAS of significant concern during its life cycle and some polymeric PFAS is subject to environmental transformations that can increase human exposure to non-polymeric PFAS.

Fourth, and as I discussed in my rebuttal to Dr. Stanton above, this argument ignores that non-polymeric PFAS processing aids for polymerization are used for the production of polymeric PFAS including fluoropolymers. From my direct testimony: "Finally, many types of PFAS are used as polymer processing aids for products containing fluoropolymers and increase the likelihood of PFAS exposure to humans through the production, use, and

disposal of consumer products (Lohmann *et al.* 2020). PFOA and perfluorononanoic acid (PFNA) were the predominant PFAS used as polymer processing aids, though they have been phased out for chemically similar legacy alternatives such as hexafluoropropylene oxide dimer acid (HFPO-DA). These PFAS substitutes have raised similar concerns as their legacy counterparts because of high persistence and mobility and its potential to accumulate in plant tissues (Liu *et al.* 2019; Lohmann *et al.* 2020)." Without considering the whole picture of fluoropolymer production, it is easy to state that fluoropolymers do not have the potential for environmental emissions of PFAS. If anything, the Rebuttal Rule, my direct testimony, and the testimony of other Department experts illustrates that not all PFAS are the same.

The third point of Dr. Korzeniowski's testimony provides a quote from the Chemicals and Biotechnology Committee of the Organisation for Economic Co-operation and Development (OECD) simply stating: "PFASs are a chemical class with diverse molecular structures and physical, chemical and biological properties, it is highly recommended that such diversity be properly recognized and communicated in a clear, specific and descriptive manner. The term 'PFASs' is a broad, general, non-specific term, which does not inform whether a compound is harmful or not, but only communicates that the compounds under this term share the same trait for having a fully fluorinated methyl or methylene carbon moiety." The Department does not rebut this assertion beyond disagreeing that this somehow proves that the Department treats all PFAS the same.

Further, the same organization (OECD) that Dr. Korzeniowski provides a quote from released a "Synthesis Report on Understanding Fluoropolymers and Their Life Cycle" in 2025 (OECD 2025). In this report, OECD adopt "a life-cycle perspective" and "outlines

fluoropolymer production, use, degradation, and environmental emissions, including the role of polymerisation and processing aids." In Figure 4, I provide a passage from the Executive Summary of the report with a specific focus on PFAS emissions throughout the fluoropolymer life cycle. A complete reading of a passage from the Executive Summary illustrates that the OECD is clearly concerned with adopting a life cycle perspective to fully understand PFAS emissions associated with fluoropolymers: "Furthermore, the interconnectedness of PFAS presence in products, their degradation, and their environmental distribution calls for a holistic, life-cycle-based approach. Effective environmental and health assessment requires mass balance analysis and advanced analytical techniques to track fluorinated substances across all stages of production, use, and disposal." This life cycle analysis from the very organization that Dr. Korzeniowski cites to claim that the Department is treating all PFAS the same refutes the narrow and simplistic perspective that Dr. Korzeniowski provided about fluoropolymers in his second point addressed above.

Fluoropolymers are widely used across industries as standalone materials, coatings, or additives, often in small amounts within complex products. Global consumption has increased, led by China, with PTFE remaining the most used but gradually declining in favour of other fluoropolymers. The life cycle stages of fluoropolymers, from monomer synthesis to end of life treatment are overviewed in the report and each stage involves particular risk management challenges. These include minimisation of hazardous byproducts during monomer production, continuing the phase out of PFAS polymerisation aids and controlling processing methods with technologies that help to mitigate environmental impacts. End-of-life management presents significant challenges, with substantial portions of production scraps recycled internally or externally, while post-use waste is predominantly incinerated or landfilled due to complex product integration and material composition. Chemical recycling shows potential but remains in early stages of development and scaling.

The report also examines the presence and persistence of various PFAS impurities in fluoropolymer products throughout their life cycle. Comprehensive data on the specific PFAS compounds present and their concentrations in commercial fluoropolymers remain limited, complicating assessment. To mitigate PFAS releases and their associated impacts, enhanced source identification, monitoring, improved process controls, and targeted strategies throughout the fluoropolymer life cycle—particularly during polymerisation, processing, and end-of-life management—are essential. These actions will support ongoing industrial transitions and regulatory efforts aimed at minimising PFAS environmental releases and exposure.

Finally, the report examines both degradation of fluoropolymers and the understanding of the release of fluorinated substance throughout the fluoropolymer life cycle. Overall, the analysis stresses a need for deeper investigation into degradation mechanisms, emissions pathways, and environmental behaviour of PFAS released across fluoropolymer life-cycle stages. Fluoropolymer production sites have been identified as key sources of environmental PFAS emissions and contamination in air, water, and soil, with both legacy and emerging compounds present. Analytical gaps, particularly around novel PFASs, impede comprehensive understanding and assessment. PTFE and other fluoropolymers are also increasingly recognized as microplastics in various environmental media, including aquatic systems. However, data on microplastic forms of fluoropolymers beyond PTFE remain scarce. Addressing these challenges requires enhanced monitoring, broader chemical tracking, and mitigation efforts to limit environmental releases and better understand the long-term impacts of fluoropolymer-related contamination.

Existing information relevant to risk management of fluoropolymers is of a fragmented nature and is dispersed across regulatory documents, scientific literature, and proprietary industry sources. This fragmentation hampers efforts to form a coherent understanding of fluoropolymers' environmental and health impacts. As such, the report underscores the value of creating a centralized, multidisciplinary data repository to support better knowledge sharing among regulators, scientists, industry and civil society. Furthermore, the interconnectedness of PFAS presence in products, their degradation, and their environmental distribution calls for a holistic, life-cycle-based approach. Effective environmental and health assessment requires mass balance analysis and advanced analytical techniques to track fluorinated substances across all stages of production, use, and disposal. The report emphasizes that improved data access, integrated methodologies, and coordinated global efforts are essential for informed decision-making and the development of sustainable fluoropolymer management practices.

Figure 4. Passage from OECD's Executive Summary of their 2025 report on understanding fluoropolymers and their life cycle.

Additionally, the Department is relying on a statutory definition of PFAS in the PFAS Protection Act. The nuance that I seek to provide in my direct testimony as well as my rebuttal testimony is that there are biological and abiotic transformation pathways in the environment that can increase consumers exposure to PFAS. It is fundamentally important

to acknowledge the complete life cycle of a product and acknowledge that human exposure to PFAS can occur throughout a consumer product's life cycle (Figure 3). Dr. Korzeniowski's inclusion of the quote from OECD illustrates a narrow and limited perspective on PFAS and somehow it is presented as evidence that the Department thinks all PFAS are the same. If anything, Dr. Korzeniowski's narrow philosophy illustrated by the inclusion of this point highlights a lack of nuance and appreciation that exposure to PFAS can occur throughout the genesis, use, and disposal of a consumer product and consumers are exposed to PFAS once released and transformed in the environment. It is the Department's view that all PFAS are not the same.

The fourth point of Dr. Korzeniowski's testimony references a 2020 "Advance Notice on the Regulation of Perfluoroalkyl, Polyfluoroalkyl Substances as a Class" from the Drinking Water and Groundwater Protection Division of Vermont's Department of Environmental Conservation. From Dr. Korzeniowski's testimony: "In its final report, the Department said, 'The Review Team spent over a year deliberating, researching, and discussing the potential to regulate PFAS as a Class. After reviewing the current peer-reviewed literature, as well as the available toxicology data for PFAS, the Review Team determined that at the current time it is not feasible to regulate PFAS as a Class.'" This assertion does not provide support Dr. Korzeniowski's claim that "all PFAS are not the same and should not be assumed to possess the same properties."

Through a full reading of the report that Dr. Korzeniowski references, it is clear that the decision not to regulate PFAS as a class by the Drinking Water and Groundwater Protection Division of Vermont's Department of Environmental Conservation (DEC) was

not made because the science of PFAS absolved regulating PFAS as a class, but because of financial, resource, and data sampling limitations. First, regulating PFAS as a class in a media contaminated by PFAS from direct sources such as drinking water and groundwater is financially burdensome and technically challenging per the written direct testimony of Dr. Ling (**NMED Exhibit 32**). Second, I provide the full context of the Vermont DEC's decision not to regulate PFAS as a class in drinking water and groundwater in Figure 5. A few select quotes: "The State of Vermont does not have the resources," "none of these techniques are ready for large-scale use or regulatory application," "granularity, standardization, uniformity, and repeatability across all media and waste streams (e.g., biosolids, leachate) in the State do not currently provide for adequate information to regulate PFAS as a class," and "As a result of this lack of information, the Agency of Natural Resources is not, at this time, recommending that PFAS be more broadly regulated as a class."

Figure 5. More context about Vermont DEC's decision to not regulate PFAS as a class in drinking water and groundwater (From Vermont DEC 2020 report).

Third, since the release of the 2020 Vermont DEC report that Dr. Korzeniowski cites, the Vermont DEC released a PFAS Roadmap in December 2023 where they list "Establish standards for classes of PFAS" as a Key Action Item under the heading "Encourage EPA to Provide National Leadership on the Management of PFAS." This report (**NMED Exhibit 73**) also highlights Vermont's Act 36, which prohibits PFAS **as a class** in certain consumer products: "PFAS from firefighting foam, food packaging, ski wax, residential carpets and rugs, and their aftermarket stain or water-resistant treatments." This update is a testament to Vermont's commitment to regulate PFAS as a class in spite of data and resource limitations discussed above.

Fourth, regulating PFAS as a class in environmental media (water, soil, air) is **fundamentally different** than regulating PFAS as a class in consumer products. Regulating PFAS as a class in consumer products — while honoring exemptions and CUU exemptions — is the only way to truly turn off the spigot of new PFAS entering New Mexico. States are not selectively prohibiting certain types of PFAS in consumer products (with the exception of PFOA and PFOS phaseouts); states are prohibiting whole classes of products across PFAS classes (**NMED Exhibit 63**). In fact, it is the regulation of PFAS as a class in consumer products today that will ease the future burden of regulating PFAS as a class in

the environment tomorrow.

The fifth point in Dr. Korzeniowski's testimony quotes a Congressional report from the Department of Defense saying: "Congress and the Federal regulatory agencies should avoid taking a broad, purely 'structural' approach to restricting or banning PFAS. It is critical that future laws and regulations, consider and balance the range of environmental and health risks associated with different individual PFAS, their essentiality to the U.S. economy and society, and the availability of viable alternatives." This report is titled "Update on Critical Per- and Polyfluoroalkyl Substance Uses," specifically focusing on Department of Defense (DoD) PFAS use. As with Dr. Korzeniowski's third point in his testimony, the Department does not rebut this assertion beyond disagreeing that this somehow proves that the Department treats all PFAS the same. In fact, Dr. Korzeniowski's quote is an endorsement of the CUU proposal process outlined in the Rebuttal Rule and guided by the PFAS Protection Act: "'currently unavoidable use' means a use of a per- or poly-fluoroalkyl substance that the board has determined by rule to be essential for health, safety or the functioning of society and for which alternatives are not reasonably available." Put simply, the Rebuttal Rule seems to align with DoD's perspective that not all PFAS are the same, contrary to what Dr. Korzeniowski claims.

The sixth and final point of Dr. Korzenioski's testimony cites a U.S. Food and Drug Administration report on PFAS in medical devices. Dr. Korzenioski again makes the claim that this argument supports the "growing scientific consensus that all PFAS are not the same and should not be assumed to possess the same properties" and says, "FDA concluded that fluoropolymers do not present health or safety concerns when used in medical devices."

Ignoring the fact that this perspective disregards the entire life cycle of the product, Dr. Korzenioski somehow uses this example to illustrate that "NMED's generalization of PFAS is not supported by science," despite having an exemption in the PFAS Protection Act specifically for "medical devices or drugs and the packaging of the medical devices or drugs that are regulated by the United States food and drug administration" *and* fluoropolymers. Beyond this, in the Rebuttal Rule 20.13.2.13 section on labeling, labeling provisions do not apply to: "medical devices, drugs, and the packaging of medical devices and drugs regulated by the United States food and drug administration." As I provide in my direct written testimony, these revisions were incorporated by directly working with interested parties to alleviate concerns around federal preemption. The Department does not claim all PFAS are the same.

In total, the testimony of Dr. Korzeniowski provides a 6-point list over 3 pages that supposedly illustrates that the Department generalizes across all PFAS and does not acknowledge: "a growing scientific consensus that all PFAS are not the same and should not be assumed to possess the same properties." With respect to the Rebuttal Rule for the EIB's consideration, this testimony ignores the 16 enumerated exemptions in the PFAS Protection Act, the existence of the CUU application process, the fact that the label provision in the Rebuttal Rule is not a "warning label," the label waiver process, and other similar labeling programs adopted by Colorado and Connecticut.

With respect to the environmental science of PFAS, Dr. Korzeniowski employs a narrow perspective focused on chemical properties of PFAS and fails to even acknowledge exposure pathways beyond direct consumer product use: environmental exposure through

indirect sources such as polymer and non-polymer PFAS production facilities, manufacturing of consumer products containing PFAS, use and disposal of the consumer product, and indirect sources including WWTPs, landfills, aerosols, and dust. The full picture of PFAS exposure is much broader, which is why my testimony has focused on a life cycle approach to understand PFAS impacts in direct and indirect manners. To protect consumers, we must turn the spigot off and stem the flow of new PFAS into New Mexico.

V. The Importance of Turning Off the Spigot of New PFAS in New Mexico Through Consumer Product Prohibitions and Labeling

Across the testimony of the three witnesses for CPMC and ACC, they make similar, narrow, inaccurate, and unsubstantiated claims. They argue that the Department treats all PFAS the same, ignoring product exemptions, CUU determinations, and pathways for labeling exemptions; they narrowly focus on fluoropolymers; and ignore that non-polymeric and polymeric PFAS emissions occur during consumer PFAS production (including in fluoropolymer production, the manufacturing of fluoropolymer containing consumer products) consumer product manufacturing, consumer product use, and consumer product disposal. Non-polymeric and polymeric PFAS alike can both transform and degrade in the environment resulting in indirect consumer exposure pathways in the air, dust, water, and soil. One could argue that the testimony written by experts for ACC and CPMC treat all PFAS the same; that all PFAS is of low concern, that PFAS exposure results only from direct consumer contact with a product during product use, and that the Department is not warranted to propose labeling requirements on consumer products containing intentionally added with simple factual statements such as “Contains PFAS” accompanied by an Erlenmeyer flask with the word ‘PFAS’

inside.

Throughout this rulemaking process the Department has engaged in good-faith discussions and collaborations with interested parties. These discussions and collaborations have resulted in the Rebuttal Rule for the EIB's consideration. It is my and the Department's hope that the Board adopt the Rebuttal Rule to turn off the spigot to new PFAS entering New Mexico through consumer products. Requiring simple labels on consumer products will allow consumers to choose whether they purchase products containing intentionally added PFAS. Help New Mexico join Connecticut and Colorado with PFAS labeling to empower consumers to choose to reduce their exposure and environmental release. Turning off the spigot today will help relieve the long-term burden faced by our state's largely rural infrastructure that provide New Mexicans with clean and safe water.

References

Barisci S and Suri R. 2021. Occurrence and removal of poly/perfluoroalkyl substances (PFAS) in municipal and industrial wastewater treatment plants. *Water Sci Technol* **84**: 3442–68.

Beisner KR, Travis RE, Alvarez DA, *et al.* 2024. Temporal variability and sources of PFAS in the Rio Grande, New Mexico through an arid urban area using multiple tracers and high-frequency sampling. *Emerging Contaminants* **10**: 100314.

Bulson EE, Remucal CK, and Hicks AL. 2023. End-of-life circulation of PFAS in metal recycling streams: A sustainability-focused review. *Resources, Conservation and Recycling* **194**: 106978.

De la Cruz FB, Titaley IA, Wang Y, *et al.* 2025. Nationwide Estimate of Volatile Per- and Polyfluoroalkyl Substance (PFAS) Emissions from U.S. Landfills via Landfill Gas. *Environ Sci Technol*.

Fredriksson F, Eriksson U, Kärrman A, and Yeung LWY. 2022. Per- and polyfluoroalkyl substances (PFAS) in sludge from wastewater treatment plants in Sweden — First

findings of novel fluorinated copolymers in Europe including temporal analysis. *Science of The Total Environment* **846**: 157406.

Henry BJ, Carlin JP, Hammerschmidt JA, *et al.* 2018. A critical review of the application of polymer of low concern and regulatory criteria to fluoropolymers. *Integrated Environmental Assessment and Management* **14**: 316–34.

Korzeniowski SH, Buck RC, Newkold RM, *et al.* 2023. A critical review of the application of polymer of low concern regulatory criteria to fluoropolymers II: Fluoroplastics and fluoroelastomers. *Integrated Environmental Assessment and Management* **19**: 326–54.

Liu Z, Lu Y, Song X, *et al.* 2019. Multiple crop bioaccumulation and human exposure of perfluoroalkyl substances around a mega fluorochemical industrial park, China: Implication for planting optimization and food safety. *Environment International* **127**: 671–84.

Lohmann R, Cousins IT, DeWitt JC, *et al.* 2020. Are Fluoropolymers Really of Low Concern for Human and Environmental Health and Separate from Other PFAS? *Environ Sci Technol* **54**: 12820–8.

Lohmann R and Letcher RJ. 2023. The universe of fluorinated polymers and polymeric substances and potential environmental impacts and concerns. *Curr Opin Green Sustain Chem* **41**: 100795.

Miller A, Kleemann K, Glüge J, *et al.* 2025. Global inventory of fluoropolymer production plants and their associated PFAS environmental contamination.

OECD. 2025. Synthesis report on understanding fluoropolymers and their life cycle. OECD Publishing.

Rankin K, Lee H, Tseng PJ, and Mabury SA. 2014. Investigating the Biodegradability of a Fluorotelomer-Based Acrylate Polymer in a Soil–Plant Microcosm by Indirect and Direct Analysis. *Environ Sci Technol* **48**: 12783–90.

Tansel B. 2022. PFAS use in electronic products and exposure risks during handling and processing of e-waste: A review. *Journal of Environmental Management* **316**: 115291.

Washington JW, Jenkins TM, Rankin K, and Naile JE. 2015. Decades-Scale Degradation of Commercial, Side-Chain, Fluorotelomer-Based Polymers in Soils and Water. *Environ Sci Technol* **49**: 915–23.