



December 31, 2024

Department of Ecology, HWTR
Safer Products for Washington program
Olympia, WA 98504-7600

Comments submitted electronically at <https://hwtr.ecology.commentinput.com/?id=9gHGTCx2EV>

Re: Safer Products for Washington Cycle 2 Draft Priority Products Report and Technical Supporting Documentation, Publications 24-04-049 and 24-04-050

On behalf of the Vinyl Institute and our members, thank you for the opportunity to submit comments on the Washington State Department of Ecology on the Second Cycle of the Safer Products Program. We are providing our comments on both the Draft Identification of Priority Products Report to the Legislature and the Draft Technical Supporting Documentation for Priority Products.

In general, the life cycle concerns described in both reports must be applied fairly and consistently across all materials used in products that are in scope. However, it is clear that this is not the case with respect to the evidence provided for PVC packaging products. Notably, there are several references in the Draft Technical Supporting Documentation which reference life cycle concerns about PVC production through end of life, despite these processes being highly regulated by federal agencies. It is misleading to the legislature and to the public to introduce these as concerns without providing ample context for either the existing regulatory requirements or the similar life cycle concerns for the alternatives that would be used instead of PVC packaging. Furthermore, in several instances, the concerns shared in the Draft Technical Supporting Documentation conflate general statements from cited references about other plastics even when they do not apply to PVC packaging.

Misapplying life cycle toxicity concerns, conflating facts from cited references, grossly misrepresenting regulations from other states and nations, failing to consider regulations from the most credible and thorough authoritative bodies, and ignoring the context of alternatives all are ways that bias was shown against PVC packaging products in these reports. In the sections below, we highlight some areas of specific concern to PVC packaging, supported by examples intended to demonstrate critical instances of this bias as identified in the two draft reports shared by the Department of Ecology. As a result, proposed designations of PVC as a priority product should be removed from both the Draft Identification of Priority Products Report and the Draft Technical Supporting Documentation for Priority Products Report.

The Criteria and Process Used to Support Restrictions on PVC Packaging are Flawed

On page 7 of the Draft Identification of Priority Products Report to the Legislature, it states: "When researching products, we focused on identifying opportunities to: Reduce disproportionate exposures in people. Reduce contamination of terrestrial and aquatic ecosystems. This was an iterative process where we used the information we gathered to inform our continued efforts. We used the information we collected on products, such as concentrations of priority chemicals in products, exposure potential, and product use, to narrow our

list of potential products. This was based on a non-quantitative process that examined how the information about each product moved us toward our goals of equitably reducing exposure and preventing releases to the environment. We used our research to define the scope of the product categories.” (emphasis added)

There are several issues with this non-quantitative process, especially with how it was ultimately used to support the inclusion of PVC packaging products. As drafted, the proposed restriction and supporting reference documents apply the stated goals and criteria inconsistently with a clear and unwarranted bias against PVC.

The stated Narrowing Criteria considers “products with frequent use patterns”, yet the criteria were not consistently applied, as PVC packaging is one of the lesser-used packaging materials but was included as a priority application anyway. The criteria also consider products with the potential to contribute to “direct exposure in people” and to “occupational exposures in Washington workers”, yet does not apply authoritative definitions of exposure. According to the Agency for Toxic Substances and Disease Registry (ATSDR), there are three potential routes of exposure:

- Ingestion: Oral ingestion of chemical and radioactive contaminants in groundwater, surface water, soil, and food.
- Inhalation: Breathing in chemical and radioactive contaminants in air (dust, vapor, gas), including those volatilized or otherwise emitted from groundwater, surface water, and soil. Communities may also be affected by smelling environmental odors in air.
- Dermal contact: Skin contact with chemical and radioactive contaminants in sediments, soil, water, and other media, such as exposed wastes or other contaminated material.

These all cite “chemical and radioactive contaminants” as a precursor for exposure. PVC is considered neither a chemical contaminant nor a radioactive contaminant by the US EPA, FDA, ECHA, or other relevant authoritative body. PVC packaging would not meet the criteria for being a product with the potential to contribute to direct exposure.

Another narrowing criterium includes “The uses of the chemicals and products, and the potential for identifying safer alternatives.” PVC has already been used safely for protecting fresh meats against mold growth, for protecting canned foods and beverages from being contaminated with toxic metals, and for protecting linens from being exposed to contamination before use in a hospital setting. There is no clear supporting evidence for how broadly switching out PVC packaging to an alternative material would do anything to improve safety for users, workers or the environment.

Yet another stated criterium is that “If other regulatory structures already exist or there are more effective paths to address a specific product-chemical combination than our program.” US EPA, FDA and OSHA are among the federal agencies which manage regulatory structures that effectively address the full life cycle of PVC packaging, from production of the raw material to the end of life of the final product. Based on this measure alone, the proposal to designate PVC packaging as a priority product should be removed from the final report to the legislature.

Cherry-Picking of Data, Conflation of Facts, Lack of Context, and Misrepresentation of Reference Citations Demonstrate Bias Against PVC Packaging

Several statements made in the Draft Technical Supporting Documentation Report highlight how facts and statements are misused against PVC packaging:

- Page 98: “Although PVC and PVDC packaging aren’t the most prevalent types of packaging materials, they are consistently included on the list of problematic consumer packaging materials for achieving sustainability and a circular economy (Ellen MacArthur Foundation and McKinsey & Company, 2016; Eunomia, 2023; US Plastics Pact, 2020).”
 - Ellen MacArthur Foundation and US Plastics Pact have consistently demonstrated a heavy anti-PVC bias as evidenced by their stated goals. On page 5 of their [2024 annual progress report](#), Ellen MacArthur Foundation highlights this claim: “Since 2020, the top quartile of brand and retail signatories have completely eliminated their use of polyvinyl chloride (PVC) and expanded polystyrene (EPS)/extruded polystyrene (XPS) in business-to-consumer packaging for FMCGs*, compared with a global market 6% increase and 4% reduction respectively.” The footnote cited (explained on page 8) indicates only that PVC and EPS/XPS “are items and materials that a significant number of Global Commitment signatories have identified as problematic or unnecessary.” This is a vague reference at best and does not give any scientific rationale for why PVC should be flagged as problematic or unnecessary. Nonetheless, on page 12 of the same annual report it also states that 29% of signatories reported an increase in their PVC usage. According to [the survey results](#) (downloadable, and available in an Excel spreadsheet), there are 24 signatories listed with greater than \$10Bn revenue who also indicated “our reported data does not cover all plastic packaging involved in the full scope of our activities.” Of the remaining 13 signatories greater than \$10Bn revenue who indicated “yes, our reported data covers all plastic packaging involved in the full scope of our activities,” four of those indicated that their portfolio includes PVC for rigid packaging applications, while the details given for “Other Packaging” included mentions of stretch film, shrink wrap, multi-material rigids, and vague descriptions of other plastics – all of which could be made using PVC but not reported as such. It is not clear how their claim that their “top quartile of brand and retail signatories” could be supported by their data, much less in a definitive and accurate manner, without significant manipulation. Despite the association between “progress” and the elimination of PVC, there is a clear bias and high degree of uncertainty involved in the Ellen MacArthur report, which is why it should not be used as the basis for regulatory action by any legislature.
- Page 98: “PVC and PVDC aren’t recyclable at scale, after consumer use, in the United States...”
 - A significant percentage of PVC used in packaging applications is for metal can liners and glass jar lid liners. Metal cans and glass jars have both been considered to be highly recyclable for decades, and the presence of PVC liners has not changed that. Flexible PVC packaging is most commonly used to protect fresh meat, primarily red meat and seafood overwrapped at a grocery store. Contamination from fresh meat products, notably blood or fatty tissue, causes fresh meat packaging to be not recycled regardless of the material used to wrap those products.
- Page 98: PVC used in packaging contributes to a larger percentage of the PVC waste generated because the majority is landfilled the same year it is produced or used. For example, in Europe, packaging is estimated to only account for around 7% of PVC use but is estimated to contribute to around 20% of the generated PVC waste after consumer use (ECHA, 2023a, 2023b).
 - This is a misinterpretation and mischaracterization of the data reported. Approximately 75% of PVC products are considered durable goods, mostly used in long-service-life

construction applications, so they are not available in the waste stream until they are uninstalled. This inherently leads to packaging products being a higher percentage of the material that is available in the waste stream, some of which is recycled as stated above.

- Page 99: “The recycling rate for overall flexible plastics in Washington is very low because only 1% of households in Washington have access to flexible film recycling through curbside collection.”
 - Regardless of what material is used – including paper – mechanical recyclers do not desire to collect packaging materials used to protect fresh meat, due to biological contamination. According to [one paper recycling resource](#), “it is imperative to separate paper from other waste materials, especially contaminated paper soiled with grease, food, or harmful chemicals which is directed to the landfill.” The vast majority of flexible PVC films available for curbside collection are used for fresh meat packaging and should be directed to waste, no different than paper or other plastics would be. Citing the low recycling rate for overall flexible plastics here as a reason to eliminate PVC packaging is irrelevant and should not be considered.
- Page 102: Plastic packaging materials made from PVC or PVDC can break down to form microplastics (defined as particles smaller than 5 mm in their longest dimension) throughout their lifecycle and contaminate indoor and outdoor environments (ITRC, 2023c).
 - In the ECHA Investigation Report on PVC and PVC Additives (November 2023, page 9), it states: “Risks due to microparticle exposures in the environment are also expected for PVC itself. However, this is not a PVC-specific issue but a general challenge for any plastics (emphasis added), which is also recognised in the EU Plastics strategy (EC, 2023c).” Therefore, PVC and PVDC packaging products should not be uniquely targeted in legislative efforts to curb the problem, especially since they represent such a small percentage of packaging products. Furthermore, federal and international authoritative bodies have not adopted any scientific evidence of microplastic generation that would justify a priority designation of PVC in packaging, so this proposal should be removed from the final report to the legislature.
- Page 102: “The potential for exposure to PVC and PVDC microplastics generated from packaging is an important consideration. Microplastics can be generated from plastic packaging during normal use when it is opened by cutting, tearing, or twisting (Sobhani et al., 2020).”
 - There is not a single reference to PVC or PVDC in the Sobhani study. Regardless of the quality of the study, or whether it is peer-reviewed, this is a blatant misapplication of the study findings to fit the narrative about PVC and PVDC. This is another clear example of the bias involved in the proposed priority designation of PVC packaging.
- Page 104: “However, it has been suggested that due to the chemical characteristics of PVC resulting from additives or weathering processes, its presence might be underestimated in the environment (Fernández-González et al., 2022).”
 - This citation is not conclusive and should not be used as to support a priority designation for PVC packaging. While the use of “might be underestimated” in statement itself demonstrates the lack of conclusiveness of the article cited, it should also be noted that the primary intent of the cited article (catchy headline notwithstanding) is to promote the use of spectroscopy when seeking to measure the presence of PVC microplastics. This is also not a scientifically accepted conclusion, as evidenced by [Sharma, et al \(Journal of Hazardous Materials Advances, Volume 14, May 2024\)](#) which indicates that a

multidisciplinary approach is needed, largely because none of the standard methods for the characterization of microplastics (Fourier transform infrared resonance, Raman Spectroscopy, and pyrolysis Gas Chromatography Mass Spectrometry) can achieve in-situ non-invasive characterization. Basing a priority designation on such a study that is so far away from making supporting conclusions is irresponsible, and is another clear demonstration of the bias involved in the proposed priority designation of PVC packaging.

- Page 104: “Plastic packaging materials that are organochlorine substances, such as PVC and PVDC, may expose people and sensitive populations to hazardous substances when disposed of at the end of life.”
 - In the [Federal Register on April 26, 2024](#), US EPA notes that the Agency denied a rulemaking petition from the Center for Biological Diversity requesting that discarded polyvinyl chloride be listed as a hazardous waste under the Resource Conservation and Recovery Act (RCRA). The Agency published a tentative denial of the rulemaking petition on January 12, 2023, then after a review of the public comments, EPA affirmed that decision, thus the petition was denied. This is a clear example of another regulatory structure that already exists, and, that is used effectively to manage PVC packaging which is subject to a proposed priority designation in the Washington Department of Ecology report. As a result, the proposal to designate PVC packaging as a priority product should be removed from the final report to the legislature.

Similarly, in the Draft Identification of Priority Products Report, several statements and citations demonstrate bias and should not be used to support a priority designation:

- Page 26: “Single-use products like packaging can have outsized environmental impacts because they’re only briefly used, don’t readily degrade, and in most cases aren’t recycled (Eunomia, 2023).”
 - This is true of all single-use products, particularly packaging, regardless of material. This is not something unique to PVC, and should not be used as justification for designating PVC packaging as a priority product.
- Page 26: “If PVC packaging isn’t properly disposed of it contributes to microplastics in the environment (Fernández-González et al., 2022; Kabir et al., 2023).”
 - Any material that is not properly disposed of will degrade in the environment and contribute to uncontrolled releases. The report lacks the context needed to compare environmental impacts from alternatives being improperly disposed of. This issue is not something unique to PVC, and should not be used as justification for designating PVC as a priority product.
- Page 26: “When burning organochlorine substances such as PVC, they can produce dioxins as degradation products (Baca et al., 2023). Dioxins are another group of organochlorine substances that are persistent, bioaccumulative, and toxic.”
 - The draft report relies on a dramatic overstatement of dioxin generation from PVC product availability in landfill as part of the assessment of PVC. The [Swedish Environmental Research Institute report](#) titled “Life Cycles Assessments and Solid Waste – Guidelines for Solid Waste Treatment and Disposal in LCA” (Sundqvist, J., IVL, Swedish Environmental

Research Institute, December 1999) states that there are two major classes of landfill incineration emissions:

- Product-related emissions, where the emitted components directly come from the waste and the quantity of the emissions can be calculated directly from the composition of the waste stream. Examples of such emissions are heavy metals, CO₂ and SO₂.
 - Process-related emissions, for which the formation is more controlled by the process than by the composition of the combusted material. Typical examples are polyaromatic hydrocarbons (PAH), CO, dioxins, etc.
- The Swedish research is correct to state that dioxins are not a result of the product, but rather the design of the landfill incineration process. However, they also state that SO₂ is an example of a key emission from landfill incineration directly attributable to the products that enter the landfill. Sulfur – the base component of SO₂ – is contained in many constituents of MSW, such as asphalt shingles, gypsum wallboard, and tires. Where the draft report incorrectly justifies a priority designation based on organohalogen product content in the waste stream, the sources of SO₂ gas generated by a MSW facility are ignored as a condition for restricting sulfur-containing products. Once again, this is not a criticism of industries which rely on sulfur-containing materials. Instead, it is obvious that the Department of Ecology is overlooking other products used in commerce and disposed of in the state of Washington without the same scrutiny.
- To further the point that product content is not as important as the process, [a 2010 research study on dioxin formation](#) titled “Chlorine Sources, Sinks, and Impacts in WTE Power Plants” was conducted by Dr. Nicholas Themelis of Columbia University’s Earth Institute, a renowned expert on combustion, waste-to-energy and the formation of dioxins. The paper states:
- “Past Columbia studies have shown that the chlorine content in MSW is in the order of 0.5%. About 45% of the chlorine content in MSW derives from chlorinated plastics, mainly polyvinyl chloride (PVC), and 55% from salt (NaCl) and chlorine-containing food and yard wastes. An estimated 97–98% of the chlorine input is converted to calcium chloride in the dry scrubber of the Air Pollution Control (APC) system and captured in the fly ash collected in the baghouse; the remainder is in the stack gas at a concentration that is one half of the U.S. EPA standard. Reducing the input of PVC in the MSW stream would have no effect on dioxin formation but would reduce the corrosion rate in the WTE boiler.”

In other words, doubling the chloride content in a waste material will not double the amount of dioxin formed during combustion. Stated in a more scientific manner, the findings from this paper can be interpreted that there is no stoichiometric relationship between chloride content and dioxin formation, even during uncontrolled combustion such as in a landfill fire. As Themelis points out in the article, dehydro-dechlorination of PVC occurs almost instantaneously and HCl volatilizes and either reacts or is neutralized by common minerals found in municipal solid waste. The Themelis study also points out that removing PVC would not affect dioxin formation in WTE facilities. More importantly, removing PVC from MSW may reduce chloride content, but there are still ample chloride sources in food, yard wastes, wood, paper, and other materials that could be chlorine

donors for dioxin formation. This draft report’s misguided focus on PVC content in a MSW stream creates a bias that leads to other more insidious substances like polyaromatic hydrocarbons (PAH) and SO₂, produced by practically all combustion incidences.

- Page 105: “PET can be used in blister packaging. Some companies have already committed to moving away from PVC in their packaging and are using available alternatives. Such as: • Unilever committed to eliminating PVC from its packaging in 2009 and by the end of 2012, 99% of Unilever packaging was free of PVC replaced with alternative materials reported to provide the same functional properties as PVC at a viable cost (Unilever, 2012).”
 - This example fails to represent the full picture shown in the 2024 Ellen MacArthur report about PVC packaging. For instance, rather than using direct elimination, other companies listed in the Ellen MacArthur downloadable data set instead moved to improve their ecological footprint by electing to use a lightweighting approach. For example, one company also listed in the >\$10Bn annual revenue range cited lightweighting of their PVC blister packaging to conserve material resources. While using less of the same material has an obvious reduction in life cycle impacts, a life cycle assessment is needed to demonstrate the reduction of impacts by switching away from PVC for a given product. This cherry-picked data from the cited report highlights should be viewed with suspicion and not relied upon as supporting evidence for a priority designation of PVC packaging products.
 - Furthermore, this reference demonstrates a blatant bias against PVC by promoting PET in blister packaging while failing to restate the reference from Baca (2023), which also reports on the relatively high levels of dioxin formation when PET is incinerated. This is not to disparage PET or any other plastic products (in fact, in 2013 EPA indicated that [forest fires are the most common source of dioxins](#)), but it is yet another example of how the report cherry-picks and conflates its references as it sees fit to deliver a narrative that was prejudged. As a result, PVC should not be singled out and designated for prioritization in this report, and all references to the same should be removed.
- Finally, as noted in Table C-27 itself, none of the recent U.S. state legislation cited therein has passed to date. Federal regulatory agencies make decisions on packaging safety, particularly for food and medical packaging. Extensive science-based testing forms the basis of decisions regarding what kinds of chemistry and at what levels can be safely used in packaging. Table C-27 should in no way be used as the basis for legislation.

PVC packaging products continue to be produced responsibly, and, in many applications, provide a positive social and environmental impact. A biased approach of inconsistently applying different standards to similar products will undermine the effectiveness of the Safer Products program for residents of Washington.

Please contact us with any questions or concerns about the submitted comments. Many thanks to the Department of Ecology for the opportunity to provide our voice in the process.

Sincerely,

A handwritten signature in black ink, appearing to read "Domenic DeCaria". The signature is fluid and cursive, with a prominent initial "D" and a long, sweeping underline.

Domenic DeCaria
Vice President – Regulatory & Technical Affairs
The Vinyl Institute