



July 14, 2023

Washington Department of Ecology
Hazardous Waste and Toxics Reduction Program
PO Box 47600
Olympia, WA 98504-7600

Re: Draft Identification of Priority Chemicals Report to the Legislature, Safer Products for Washington Cycle 2, Implementation Phase 1
(see - <https://apps.ecology.wa.gov/publications/documents/2304038.pdf>)

I. Overview

The U.S. Tire Manufacturers Association (USTMA) and our member companies appreciate the opportunity to provide comments on the Department of Ecology's Draft Identification of Priority Chemicals Report to the Legislature, Safer Products for Washington Cycle 2, Implementation Phase 1 ("Draft Report").¹ USTMA is the national trade association for tire manufacturers that produce tires in the U.S. and are responsible for more than 291,000 jobs, and have an annual economic footprint of \$170.6 billion in the United States. USTMA advances a safe and sustainable tire manufacturing industry through a commitment to science-based public policy advocacy. The tires from our member companies make mobility possible and keep the U.S. economy moving.

Safer Products for Washington is implemented through a four-phase cycle that repeats every five years. Ecology's Draft Report identifies priority chemicals and chemical classes for the first phase of the second cycle of Safer Products for Washington implementation. Ecology's Draft Report identifies 6PPD as a priority chemical with respect to sensitive species and populations.

Separately, the Washington State Legislature has tasked Ecology with preparing an Alternatives Assessment ("AA") on 6PPD in motor vehicle tires to identify compounds with the potential to replace 6PPD in these products. USTMA is submitting separate comments to Ecology on its Draft 6PPD AA hazard criteria document, which are incorporated by reference in USTMA's comments on the Draft Report.²

USTMA would like to emphasize the following comments on Ecology's Draft Report:

II. **Protection materials, such as 6PPD, are essential for tire performance and safety and any potential alternative must continue to ensure compliance with Federal Motor Vehicle Safety Standards ("FMVSS") and additional industry and consumer performance requirements.**

¹ USTMA members include: Bridgestone Americas, Inc., Continental Tire the Americas, LLC; Giti Tire (USA) Ltd.; The Goodyear Tire & Rubber Company; Hankook Tire America Corp.; Kumho Tire Co., Inc.; Michelin North America, Inc.; Nokian Tyres; Pirelli Tire North America; Sumitomo Rubber Industries, Ltd.; Toyo Tire Holdings of Americas Inc. and Yokohama Tire Corporation.

² 6PPD Alternatives Assessment Hazard Criteria document available here:
<https://apps.ecology.wa.gov/publications/documents/2304036.pdf>

Tire manufacturers are required by law to certify to the National Highway Traffic Safety Administration (“NHTSA”) that every tire they manufacture meets safety, durability, and other performance requirements prior to their sale to the consumer. The Safety Act, 49 U.S.C. §§ 30103-30105 et seq., explicitly preempts any state law or regulation that conflicts with a NHTSA regulation relating to “safety.” The rationale, simply put, is that vehicles are a significant means of transportation for citizens and freight. They travel from one state to another and between countries. The absence of a uniform set of safety rules would allow one state to impose arbitrary requirements that could significantly impact interstate commerce. Thus, Ecology’s ability to impart a material change required under the Safer Products for Washington law would be significantly limited by the safety and performance requirements that tire manufacturers must meet.

III. 6PPD provides critical functions in manufacturing safe and durable tires.

Potential alternatives to 6PPD must provide the same critical functions that 6PPD provides in a tire including:

- Optimal migration rate and diffusion in rubber compounds
 - Adequate solubility and diffusivity in rubber compounds is also referred to as migration and mobility.
 - Continuously present at the surface of the tire to ensure protection of the rubber formulations from degradation due to ozone.
 - Available in rubber formulation over a tire’s entire life cycle to ensure protection of the rubber
- Protection against ozone
 - Readily reactive with ozone to prevent crack formation on the surface of the rubber, but not too reactive in order to prevent premature depletion
- Protection against oxygen
 - Reactive with oxygen to prevent hardening of the rubber, loss of strength, and improve tire wear
- Protection against fatigue
 - Reactive with the free radicals generated by the breaks in polymer during flexing. These free radicals can break the polymer chains and crosslinks in the rubber compound that would lead to a loss of strength
- Manufacturing Impact
 - No adverse effects on the processability of rubber compounds
 - Resistance to temperatures encountered during the tire manufacturing process
- No adverse effects on tire safety and performance

IV. USTMA supports Ecology’s analysis of potential 6PPD alternatives, provided it is conducted consistently with the statutory requirements and Ecology’s own precedent

In 2019, the Washington State Legislature directed Ecology to implement a regulatory program to reduce toxic chemicals in consumer products (Chapter [70A.350](#) RCW). The implementation program is called Safer Products for Washington. The statute provides that Ecology “may not identify the following as priority consumer products ... motorized vehicles, including on and off-highway vehicles, such as all-terrain vehicles, motorcycles, side-by-side vehicles, farm equipment, and personal assistive

mobility devices.” RCW70A.350.030(5)(a)(vi). The statute further defines “consumer product” to mean “any item, including any component parts and packaging, sold for residential or commercial use.” RCW 70A.350.010(1). Appendix G of Ecology’s Final Regulatory Determinations (“[Final Report](#)”) report states that Ecology will not identify “motorized vehicles, including on and off-highway vehicles, such as all-terrain vehicles, motorcycles, side-by-side vehicles, farm equipment, and personal assistive mobility devices” as priority consumer products. Final Report at 364. Under the statute, component parts associated with motorized vehicles (e.g., tires) are exempt. USTMA is concerned that any regulatory action arising out of an alternatives assessment regarding tires as priority products would be outside the scope of Ecology’s authority.

Ecology may only restrict the use of a priority chemical in a priority consumer product, if safer alternatives are feasible and available. RCW70A.350.040(3)(a). Ecology has stated that to be considered feasible, an alternative must meet at least one of the following criteria:

- Already used for the application of interest or a similar application.
- Marketed for the application of interest or a similar application.
- Identified as feasible by an authoritative body.
- To be available, an alternative must be either:
 - Currently used for the application of interest; or
 - Offered for sale at a price that is close to the current.

Any alternative to 6PPD identified by Ecology must be feasible and available in the context of safety and performance requirements that tires must meet. An alternative that does not enable a tire to meet safety and performance requirements would be considered per se not feasible and available. Ecology’s recently promulgated rule for Cycle 1 recognized limits on Ecology’s authority. For example, Ecology’s determination reports recognize the limits on its regulatory authority. In the Final Report, Ecology states that “[i]f at any point federal action preempts our ability to implement the restrictions...we will require reporting of priority chemicals in those priority products.” Final Report at 25. Ecology, for example, recognized the limits imposed on its regulatory authority as a result of an exemption that the Environmental Protection Agency (“EPA”) established for inadvertently generated PCBs and decided not to implement a restriction on inadvertent PCBs in paints and inks. Final Report at 29. To support its determination, Ecology noted that the “only other option for a restriction would be implementing rules identical to EPA.” Final Report at 29.

Ecology’s report identifying priority chemicals for Cycle 2 (“Priority Chemicals Report”) noted that it narrowed its list of chemicals to the seven classes identified “by deprioritizing those with existing effective regulatory structures and prioritizing those with potential for: equitably reducing exposure; preventing regrettable substitutions; reducing environmental persistence; reducing carcinogens, mutagens, reproductive and developmental toxicants, and endocrine disruptors; and reducing production and release volumes.” Priority Chemicals Report at 23; *see also* [Safer Products for Washington Draft Priority Chemicals for Cycle 2 webinar](#), at Slide 14 (Ecology deprioritizes chemicals with existing, effective regulatory structures). Moving forward, Ecology needs to recognize and consider the safety and performance requirements that tires must meet and how that impacts Ecology’s ability to regulate 6PPD under both federal preemption analysis and Ecology’s feasibility analysis.

V. USTMA welcomes the opportunity to work with Ecology to provide information on the performance of possible alternatives to ensure driver safety

In December 2020, a research paper by Tian et al. 2020 was published that suggests a link between 6PPD-quinone and coho salmon mortality.³ 6PPD-quinone is not used in tire manufacturing. It is a transformation product of 6PPD that may form when 6PPD reacts with oxygen and/or ozone. 6PPD is an antioxidant and antiozonant that helps prevent the degradation and cracking of rubber compounds caused by exposure to oxygen, ozone, temperature fluctuation, and flexing induced fatigue. These benefits of 6PPD are critical to effective tire endurance and thus ultimately to motor vehicle safety. That said, as a science-driven industry committed to safety and environmental stewardship, we take the findings of this study seriously. In December 2020, USTMA requested that the California Department of Toxic Substances Control (“DTSC”) include 6PPD in tires on the 2021-2023 Priority Products Work Plan for the Safer Consumers Products Regulation (SCPR). USTMA sought a review of 6PPD in tires in California rather than Washington, because at the time the Tian et al. study was released, DTSC was in the process of revising its Priority Products Work Plan and the SCPR provided the fastest path forward to complete an alternatives analysis on 6PPD. A review of 6PPD in tires under the SCPR provides a scientific, regulatory framework to analyze whether alternatives exist that will enable tire manufacturers to ensure both tire and environmental safety. DTSC added 6PPD in tires to the Priority Products Workplan in early 2021 and since that time, USTMA has worked to support a review of 6PPD in tires under the SCPR.

The Safer Products for Washington enacting legislation encourages Ecology to consider actions taken by other states. For example, when selecting priority consumer products, Ecology is required to consider certain factors, including “[i]f another state or nation has identified or taken regulatory action to restrict or otherwise regulate the priority chemical in the consumer product.” RCW 70A.350.030(2)(e). When determining regulatory actions, Ecology is encouraged to consider whether a “restriction would be consistent with regulatory actions taken by another state or nation on a priority chemical or members of a class of priority chemicals in a product.” RCW 70A.350.040(4)(b).

During Cycle 1 of the Safer Products for Washington Program, Ecology acknowledged relevant activities in other states. For example, Ecology’s Regulatory Determinations Report to the Legislature stated that to identify safer alternatives, Ecology used – among other things – “[e]xisting alternatives assessments.”⁴ Ecology also cited to and used DTSC studies developed under the California SCPR⁵ as well as relevant material restrictions in other states.⁶

Given the similarities between an ongoing alternatives analysis in California and the process on which Ecology is embarking, Ecology should closely coordinate with DTSC to ensure a thorough and consistent assessment and analysis of the potential alternatives. After DTSC finalizes its designation of automotive tires containing 6PPD as priority products in California, this will trigger an obligation for the tire industry to develop and submit to DTSC an alternatives analysis. This alternatives analysis is already well underway – USTMA is not waiting for DTSC to finalize the designation before starting it. Once the alternatives analysis is complete, DTSC will evaluate it and decide whether it meets applicable legal requirements. DTSC will also decide whether to undertake a regulatory response regarding automotive

³ Tian Z et al. (2021). A ubiquitous tire rubber-derived chemical induces acute mortality in coho salmon. *Science*. 371(6525):185–189. doi: 10.1126/science.abd6951.

⁴ Regulatory Determinations Report to the Legislature: Safer Products for Washington Cycle 1 Implementation Phase 3, at 64.

⁵ *Id.* at 286; 358.

⁶ *Id.* at 68.

tires containing 6PPD. USTMA is committed to providing Ecology with the same information it provides DTSC as part of the AA process on an ongoing and timely basis.

The California and Washington processes will be similar and directly linked. Both alternative analyses will involve evaluating whether potential alternatives are feasible for use in tires and would represent safer alternatives. At the end, the agencies will decide what regulatory response to undertake, if any. The processes are compatible and consistent. In California, the AA is already underway and, once completed, will be reviewed and approved by DTSC. Furthermore, because the tire industry will be directly involved in the alternatives analysis in California and currently possesses the best information about potential 6PPD alternatives, tire safety, and tire regulatory requirements, it would be helpful and efficient for Ecology to leverage the California alternatives analysis. USTMA is encouraged by Ecology's recent June 21, 2023 webinar discussing the draft priority chemicals for Cycle 2, in which Ecology acknowledged that "significant efforts by Washington, California, and other states, and the tire industry are being undertaken to identify safer alternatives to 6PPD used as an anti-degradant in vehicle tires." Safer Products for Washington Draft Priority Chemicals for Cycle 2 webinar, at Slide 48. Moving forward, USTMA requests that Ecology closely coordinate with DTSC as part of its 6PPD analysis and strongly consider adopting positions consistent with DTSC's.

VI. The assessment and testing processes necessary to evaluate potential alternatives to 6PPD in tires, and to ensure tire safety and performance, are complex and rigorous

To identify a possible alternative that ensures both motorist and environmental safety, extensive testing is needed. A variety of laboratory screening tests must be performed for each tire component to assess functionality of the candidate alternative in the rubber compound for each tire component. These laboratory screening tests must be performed and completed with satisfactory results before a tire is built. Candidate alternatives that do not pass these initial laboratory screening tests would not be moved forward in the testing evaluation process. Candidate alternatives that do pass this initial screening testing would be moved on to the evaluation process which would include building a tire and performing a multitude of performance and safety tests before the tire could be assessed on a vehicle. Tires containing the candidate alternative would need to meet these performance and safety tests before being assessed for further testing on vehicles. The testing to evaluate candidate chemicals in tires is extensive and required to ensure compliance with applicable Federal Motor Vehicle Safety Standards (FMVSS) and other tire performance and safety requirements.

VII. The persistence and bioaccumulation potentials of 6PPD have been mischaracterized throughout Ecology's Draft Report and should be corrected.

In various sections throughout Ecology's Draft Report, 6PPD is stated to be potentially persistent and bioaccumulative, however 6PPD is not characterized as either according to regulatory agencies or other authoritative bodies including OECD, ECHA, Environment Canada and Chemicals Inspection & Testing Institute of Japan (CERI). In the Hazard of 6PPD and the Environmental Fate sections of Ecology's Draft Report, should be revised to accurately reflect the designations for 6PPD.

In the Hazard of 6PPD section of Ecology's Draft Report, the designation of high bioaccumulation is based on GreenScreen criterion, not regulatory criterion. For example, because the bioconcentration factor for 6PPD is less than 2000, it is not given the bioaccumulation classification in EU under REACH or by Env. Canada. Similarly, OECD 2004 concluded that 6PPD is not bioaccumulative. Testing data provided in the REACH dossier states that 6PPD hydrolyses rapidly within a half- life of about 8 hours,

hence it is not persistent. As such experimental data for the hydrolysis products 4 - hydroxydiphenylamine, N-phenyl-p-benzoquinone monoimine and 1,3 -dimethylbutylamine were taken into account. A QSAR model for 6PPD yielded a BCF of 569. Even considering uncertainties using a QSAR, this value indicates that the original substance does not meet the bioaccumulation criterion of 2000. Additionally, the bioconcentration factor of the two main hydrolysis products of 6PPD, 4-anilinophenol (4-hydroxydiphenylamine) and its oxidized form N-Phenylphenyl-p-benzoquinone monoimine, were investigated by the Chemicals Inspection & Testing Institute of Japan (CERI, 1995, National Institute of Technology and Evaluation 2002) according to OECD Guideline 305 C, using *Cyprinus carpio* as test organism. The BCFs ranged from 3.3 - 49 and < 1.2 - 23, and 1.7-17, respectively and therefore do not meet the criterion for classification as bioaccumulative. The statement that there is not much known about the hazards of 6PPD-quinone seems overly broad. Over the past 2.5 years since the chemical was discovered, quite a bit has been learned about the ecotoxicity. This sentence should be rephrased to indicate that information regarding the hazards of 6PPD-q is emerging, with most of the currently available hazard data focused on aquatic species.

In the Environmental Fate section of Ecology's Draft Report, the Castan et al. 2022 study is referenced as evidence of potential 6PPD bioaccumulation, however, on the contrary, the study does not demonstrate that 6PPD bioaccumulated. In fact, the researchers reported that the uptake into the lettuce leaves was followed by a rapid concentration decrease. Over the course of 14 days of exposure, 6PPD peaked at 7 days and then decreased to concentrations close to the limit of quantification (LOQ). In a similar manner, the Ji et al. 2022 study was also referenced as evidence of bioaccumulation of 6PPD, however the study does not show bioaccumulation. Rather, the researchers detected the presence of 6PPD in 2 out of 10 fish that were tested and 6PPD-quinone was detected but at concentrations less than the limit of quantification in 1 of 10 fish. This study involved a small sampling and analysis of fish from a food market in Beijing China and was not a guideline study to determine bioaccumulation (OECD Method 305).

VIII. Correction is needed to Referenced Hazard Assessment

Please correct the information in Table 29 to reflect that 6PPD-quinone has a CAS Number. It is 2754428-18-5.

IX. USTMA recommends that Ecology revise the Human Exposure section of Ecology's Draft Report to ensure it accurately reflects the findings in the published literature.

USTMA asks that Ecology clarify the findings for the citation to Armada et al. 2023. The authors detected 6PPD and 6PPD-quinone in the synthetic gastrointestinal fluids extract of the crumb rubber but did not quantify the amount of either substance. USTMA suggests adding a sentence related to the Schneider et al.(2020a)⁷ study wherein the authors measured the bioaccessibility of 6PPD in synthetic gastrointestinal fluids extract from crumb rubber and reported the substance had very low bioaccessibility; approximately 0.58% was bioaccessible. Further, the authors concluded in a risk assessment of children potentially exposed to the crumb rubber from use in artificial turf fields that the

⁷ Schneider, K; de Hoogd, M. ; Haxaire, P.; Phillips, A.; Bierwisch, A.; Kaiser, E. (2020) (a). ERASSTRI – European Risk Assessment Study on Synthetic Turf Rubber Infill – Part 2: Migration and monitoring studies. *Science of the Total Environment*: 718 (2020) 137173.

risk ratio was less than 0.2 and therefore demonstrated a low potential for health risk (Schneider et al. 2020b)⁸.

X. USTMA recommends that Ecology revise the Environmental Monitoring Data section of Ecology's Draft Report to ensure it accurately reflects the findings in the published literature.

The first sentence in the Environmental Monitoring Data section which states that 6PPD and its transformation products "are likely present in almost all media worldwide" is grossly overstated. In fact, there are very few studies and samples for 6PPD and 6PPD-quinone that have been reported in the published literature and the detection frequency has been very low in some media. For example, Rauert et al. 2022 reported non-detects at several of the sampling sites in Australia and Johannessen reported that all air samples from around the world were either non-detect or less than the limit of quantification for 6PPD. As such USTMA recommends that the sentence be revised to reflect the current state of knowledge.

The second paragraph in this section is misleading with respect to the comparison of measured concentrations of 6PPD-quinone to the LC50 for coho salmon. The sentence "Again, these reported concentration often are above the LC50 values of sensitive species," is inaccurate because of the studies cited, only Johannessen et al. 2022 measured concentrations greater than the LC50s for coho salmon and other sensitive species. H.Y. Zhang et al. 2023 and Rauert et al., 2022 did not measure concentrations above the coho salmon LC50. R. Zhang et al. 2023 measured 6PPD-quinone in WWTP effluents in 1 out of 118 samples and the measurement did not exceed the LC50 for coho.

XI. USTMA recommends that Ecology revise the Potential to Contribute to Adverse Effects section of Ecology's Draft Report to ensure it accurately reflects the findings in the published literature.

In sensitive species discussion, USTMA recommends that citations be provided for the studies associated with this sentence:

"Although 6PPD-q shows extremely high acute toxicity to some species, including coho salmon, brook trout, and rainbow trout, it shows much lower acute toxicity to other species, such as zebrafish. 6PPD-q was not acutely toxic, even at high concentrations, to species closely related to coho salmon, such as Atlantic salmon, chum salmon, and sockeye salmon."

USTMA disagrees with the statement that chronic effects of 6PPD-quinone to aquatic species have been observed and that those effects occur at much lower concentrations than the LC50 value based on the studies cited. In fact, Ji et al 2022 was not a chronic study - it was for 12 hrs and the lowest concentration tested was 50 ug/L, which is well above the LC50 values for 6PPD-quinone and coho salmon. Also Varshney et al. 2022 was an acute study, not a chronic study and the lowest tested concentration of 1 ug/L was above the coho LC50, and furthermore effects were not seen until 10 ug/L.

XII. Conclusion

USTMA thanks Ecology for the opportunity to provide comments on the Draft Identification of Priority Chemicals Report to the Legislature, Safer Products for Washington Cycle 2, Implementation

⁸ Schneider, K.; Bierwisch, A.; Kaiser, E. (2020)(b). ERASSTRI – European Risk Assessment study on synthetic turf rubber infill – Part 3: Exposure and risk characterisation. Science of the Total Environment. 718 (2020) 137721

Phase 1. We welcome the opportunity for continued dialogue with Ecology on this topic and the opportunity to discuss our comments in greater detail. If you have any questions, please contact Jamie McNutt (jmcnutt@ustires.org; 202-682-4845).