August 4, 2025

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Re: DTSC's proposed rulemaking to add microplastics to the Candidate Chemicals List - Support

Dear Ms. Butler:

The following undersigned organizations support DTSC's proposed rulemaking to add microplastics to the Candidate Chemicals List in order to protect our communities, water, and other resources from plastic pollution. Many of us also submitted comments supporting the proposal to add microplastics to the Candidate Chemicals List in 2023 and all of us are pleased to see DTSC continuing the process through the proposed rulemaking.

DTSC has defined microplastics as plastics that are less than 5 millimeters (mm) in their longest dimension, inclusive of those materials that are intentionally manufactured at those dimensions or are generated by the fragmentation of larger plastics. We reiterate that microplastics, as

defined in this way, meet the California Code definition of chemicals provided in California Code Regs. tit. 22, section 69501.1(a)(20)(A)(1), which reads that "(A) Chemical" means… An organic or inorganic substance of a particular molecular identity, including any combination of such substances occurring, in whole or in part, as a result of a chemical reaction or occurring in nature, and any element, ion or uncombined radical, and any degradate, metabolite, or reaction product of a substance with a particular molecular identity" and further that "molecular identity" may be defined in terms of a substance's particle size, size distribution, and surface area. The regulations define the molecular identity of microplastics based on particle size.

Further, pursuant to Cal. Code Regs. Tit. 22, § 69502.2(b), chemicals may be listed on the Candidate Chemicals List if they exhibit "one or more hazard traits and/or an environmental or toxicological endpoints," considering potential adverse impacts (as demonstrated by hazard traits) and potential exposures based on reliable information. Hazard traits have been identified pursuant to Chapter 54 of Division 4.5 of Title 22 of the California Code of Regulations (Green Chemistry Hazard Traits for California's Toxics Information Clearinghouse) and include environmental persistence, mobility in environmental media, and particle size or fiber dimension. In the technical document DTSC has outlined evidence demonstrating that microplastics in fact meet this definition.[1] Per the Health and Safety Code section 57004, DTSC requested external peer review of the scientific basis for proposed regulation. External peer reviewers largely agreed that 1) microplastics exhibit the environmental persistence hazard trait; 2) microplastics exhibit the mobility in the environment hazard trait; 3) microplastics exhibit the particle size or fiber dimension hazard trait and 4) there is potential for exposures to microplastics.[2] Here, we again reiterate and briefly elaborate upon several of these points.

Microplastics are ubiquitous in the environment, being detected in freshwater, sea water, soil, sediments, air, and food.[3] Unfortunately the breakdown of plastic polymers in the environment is very slow and depends upon the chemical composition of the plastic polymer, and numerous environmental conditions such as UV radiation, oxidation, temperature, and mechanical stress.[4] Our continued and growing use of plastic polymers for numerous industrial and consumer products ensures that there will be an ongoing input of microplastics into the environment for the foreseeable future. The ubiquity of microplastics in the environment contributes to widespread exposures across all taxonomic levels, including humans.

Microplastics are persistent, meaning that they stay in the environment for long periods of time. In an aquatic environment, Zhu and colleagues estimated that several microplastic polymers may persist for many years in surface seawater, only very slowly losing their carbon and mass to the environment.[5] In soil, even bioplastic polymers that are designed to biodegrade can last for years if environmental conditions such as soil temperature are not optimal.[6]

Microplastics are also mobile in the environment, meaning that they can readily move throughout the environment once they are released. Whether in the air or in water, their low density and large surface area to-volume ratio allows microplastics to travel long distances.[7] For example, microplastics have been found to travel in the atmosphere over 95 km to remote mountain locations and to be deposited in the Arctic in snowfall.[8]

These three findings - that microplastics are ubiquitous, persistent, and mobile in the environment - means there are increased opportunities for human exposure to microplastics to occur. Already, there is evidence that widespread human exposure to microplastics is occurring through inhalation, ingestion, hand to mouth contact, and via dermal exposures.[9] Exposures through contact with vaginal tissues and ocular tissues are understudied but also pose a concern.[10] Microplastics have been found in the human brain, heart, blood, lungs, veins, colon, liver, placenta, penis, testicles, and amniotic fluid.[11] They are found on human skin and hair.[12] They have also been detected in breast milk, stool—including meconium, a baby's first fecal matter—mucus, saliva, and semen samples.[13]

The evidence for health effects related to microplastics exposure is also growing and is highly concerning. In one study, scientists found that the presence of microplastics in arterial plaque is associated with an increased risk of heart attack, stroke, and death.[14] A review of 34 studies evaluating workers exposed to various types of microplastics in dust found that those exposed to polyvinyl chloride microplastics had increased risk of liver cancer.[15] Scientists have also found that patients with inflammatory bowel disease had more microplastics in stool samples than healthy subjects; patients with liver cirrhosis had more microplastics in their liver than patients without underlying liver disease; patients with chronic rhinosinusitis had more microplastics in their nasal cavities; and women with intrauterine growth–restricted pregnancies (where a baby doesn't grow to normal weight during pregnancy) had more microplastics in their placenta compared with women with healthy pregnancies.[16]

Studies finding microplastics harm human health are further supported by a rapidly growing body of toxicological evidence in animals, particularly demonstrating that microplastic exposure harms reproductive, digestive, and respiratory health.[17] There is also growing evidence that microplastics are transferred through ecological food webs and are associated with a variety of ecotoxicological effects.[18]

Together, the hazard characteristics described here support the listing of microplastics on the Candidate Chemicals List.

While we support the addition of microplastics to the Candidate Chemicals List and the proposed definition for microplastics, we recommend that DTSC also define "plastics" to provide greater clarity and avoid potential confusion in the future about the scope of the term. The definition could be drawn from a number of readily available sources. The technical document contains a description of plastics (pp. 2-3). The State Water Board has a definition of microplastics developed in response to a state mandate that also includes definitions of polymers that would constitute plastic, and that DTSC has previously referenced in earlier drafts. California's packaging law, SB 54 (Allen), also includes a definition of plastic.

Thank you for the opportunity to provide feedback on DTSC's proposal to add microplastics to the Candidate Chemicals List. We urge DTSC to rapidly approve this listing, as it is an important first step in providing a solution to address the threats associated with microplastic pollution.

Sincerely,

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