



30 August 2019

Meredith Williams
Acting Director
Department of Toxic Substances Control
8800 CalCenter Drive
Sacramento, CA 95826
(via CalSafer portal: <https://calsafer.dtsc.ca.gov/cms/commentpackage/?rid=12743>)

RE: ACI Comments on Work Plan Implementation for 1,4-Dioxane in Personal Care and Cleaning Products

Dear Mrs. Williams:

The American Cleaning Institute® (ACI)¹ is pleased to provide the following comments concerning the Department of Toxic Substances Control's proposed Work Plan Implementation for 1,4-Dioxane in Personal Care and Cleaning Products. ACI supports the Department's efforts to issue and seek public comment on this proposed plan that would affect consumer products.

ACI appreciates the opportunity during the August 21st Public Meeting on 1,4-Dioxane in Personal Care and Cleaning Products to both present the current state of 1,4-dioxane formation, control, and occurrence in cleaning products, and to participate during the panel discussion. These written comments reflect the statements made during the meeting.

As background, finished consumer products are formulated with ingredients that are safe and effective for their intended use. Surfactants are the workhorse ingredients for cleaning products. Two major classes of surfactants, alcohol (alkyl) ethoxylates (AE) and alkyl ethoxysulfates (AES), have many performance attributes that contribute to the sustainability profile of cleaning products produced by ACI members, including good cold water cleaning, good solubility allowing for product compaction, low irritation, and rapid and ultimate biodegradation. Currently, there are no viable replacements (no drop-in ingredients) for these surfactants.

1,4-dioxane can be detected in trace amounts as a byproduct of the manufacturing process of ethoxylated and ethoxy-sulfated ingredients. It should be noted that 1,4 dioxane is not intentionally

¹ ACI represents the \$60 billion U.S. cleaning product supply chain. ACI members include the manufacturers and formulators of soaps, detergents, and general cleaning products used in household, commercial, industrial and institutional settings; companies that supply ingredients and finished packaging for these products; and chemical distributors. ACI serves the growth and innovation of the U.S. cleaning products industry by advancing the health and quality of life of people and protecting our planet. ACI achieves this through a continuous commitment to sound science and being a credible voice for the cleaning products industry.

added, or used as a raw material in surfactant production. It is a trace level technically unavoidable byproduct from the chemical reaction.

The presence of 1,4-dioxane in the sulfated surfactant ingredients can be controlled during two phases of the production processes. The first phase is during the reaction of AE to AES; through proper reactor loading, controlling the sulfur trioxide to AE ratio and by minimizing the residence time of AES acid prior to neutralization the formation of 1,4-dioxane will be minimized. The AE feedstock composition also factors into the formation of 1,4-dioxane during this reaction. The second phase in which the concentration of 1,4-dioxane in AES can be lowered is during the post-reaction work up. This is accomplished by vacuum stripping the AES paste.

The following paragraphs describe concerns with the scope of the products covered, the absence of consideration of other sources of 1,4-dioxane to the environment, and challenges that measuring 1,4-dioxane in cleaning products at an alternatives analysis threshold (AAT), as described in the DTSC proposal, would present. After considering both the written comments and verbal input of all stakeholders, if DTSC still desired to proceed forward, ACI would suggest a conversation discussing reasonable and measureable levels of 1,4-dioxane in personal care and cleaning products.

Scope of priority product(s)/candidate chemical

DTSC released an AAT proposal that discussed personal care and cleaning products without proposing a priority product for either category. As demonstrated in ACI's presentation during the Public Meeting, the ethoxylated/sulfated surfactants are in all cleaning product categories described in the online database, Cleaning Product Ingredient Safety Initiative (CPISI). Further, the 2013-2015 CARB survey encompassed over 150 categories that could be considered cleaning products. In addition, the recently enacted Cleaning Product Right to Know Act (SB-258) defined numerous product categories within its scope. ACI recommends that DTSC limit the candidate chemical/priority product scope or the department will be flooded with reports from manufacturers with products that may contain trace amounts of 1,4-dioxane, even if the trace amount is below the threshold value (as per the regulation). ACI recommends that DTSC consider the burdens of this reporting requirement as the department is unlikely to have the resources to accommodate the volume of documentation that would be submitted, even when the priority product categories are specified.

Other 1,4-dioxane sources to the environment

While DTSC's background document for 1,4-Dioxane in Personal Care and Cleaning Products, states, "Industrial discharge often represents the largest source of 1,4-dioxane in wastewater...", there is no further discussion of those sources of contamination. Instead, DTSC has focused on potential trace releases of 1,4-dioxane from down-the-drain disposal of personal care and cleaning products. Further, DTSC has relied upon inadequate and unsubstantiated data to estimate the contribution of 1,4-dioxane in water from down-the-drain activities of sample products in the AAT Proposal. The Department relies upon unproven methodologies and small sample sizes in reports without scientific review or publication in peer review journals as the basis for the down the drain estimations. While ACI generally agrees with DTSC's methodology, ACI would recommend a

more robust dataset for estimating the contribution of 1,4-dioxane in water from laundry detergent beyond the 18 products tested. According to the CARB 2015 survey, there were 1757 different laundry detergent products sold in the state of California that could be liquid, powder, concentrates or liquid laundry packets. Because of the differences in the concentration of surfactants per product form, and how they are used, the expected resulting down the drain contribution will vary and a single number cannot be used. For estimating the down-the-drain concentration of 1,4-dioxane from laundry products, dilution from wash water should be taken into account. The volume of water can vary significantly in a standard washing machine compared to a high efficiency (HE) machine. ACI recommends that DTSC conduct further research/market analysis to ensure the baseline estimates are correct for optimal program outcomes.

Measuring 1,4-Dioxane in Finished Products

DTSC identified several methods for quantifying 1,4-dioxane in finished products. The Department identified EPA Method 522 as a method for quantifying 1,4-dioxane in water; but noted its limitations in personal care and cleaning products. DTSC also identifies FDA-USP methods 228 and 467 and EPA Method 8260 and 8270 as testing protocols that can determine 1,4-dioxane content but note that modifications would be necessary to accommodate the wide array of personal care and cleaning products. DTSC concludes that with modifications to EPA Method 8260 and 8270, they anticipate that laboratories would be capable of reaching a PQL of 1 ppm for all products. However, method development and validation is critical to obtain reliable, repeatable results. ACI recommends that DTSC include a validated method in the proposed regulation. We envision this would necessitate development of a method for formulated products and validation with intra-laboratory (round-robin) testing to ensure accurate testing results.

Conclusion and Recommendations

ACI recommends that DTSC propose Priority Products with adequate, scientifically defensible reasoning for regulating 1,4-dioxane in those products. DTSC's proposed AAT relies on limited reports as justification to discuss a threshold value of 1 ppm. DTSC needs scientific research and data before Priority Products are proposed.

If DTSC moves ahead with regulations, ACI recommends moving forward with a reasonable and measureable threshold in personal care and cleaning products. This recommendation is based on the fact that the 1 ppm proposal is predicated on a PQL that has not been tested or validated across the variety of potentially impacted products.

ACI appreciates this opportunity to provide comments and looks forward to further engagement with DTSC on the implementation of the 1,4-dioxane work plan.

Sincerely,

A handwritten signature in cursive script, reading "Kathleen Stanton". The ink is dark and the signature is fluid, with a long, sweeping underline.

Kathleen Stanton
Senior Director, Technical & Regulatory Affairs