TRICHLOROETHYLENE (TCE); REGULATION UNDER THE TOXIC SUBSTANCES CONTROL ACT (TSCA)

Office of Pollution Prevention and Toxics
United States Environmental Protection Agency

AMERICAN FUEL & PETROCHEMICAL MANUFACTURERS COMMENTS

Attention: EPA–HQ–OPPT–2020–0642; FRL–8317–01–OCSPP

December 15, 2023
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1200 Pennsylvania Avenue, NW
Washington, DC 20004

I. Introduction

The American Fuel & Petrochemical Manufacturers ("AFPM") respectfully submits these comments on the Environmental Protection Agency's ("EPA" or "the Agency") Federal Register notice titled, "Trichloroethylene (TCE); Regulation Under the Toxic Substances Control Act (TSCA)" ("Proposed Rule" or "Proposal"). In its Federal Register notice, EPA is proposing a broad ban for TCE, with staggered effective dates for a small number of uses.[1] The Proposed Rule does not mention any uses related to petroleum refining. AFPM's comments highlight the following concerns:

- The Proposal does not consider how chlorinated hydrocarbons are produced or the potential presence of TCE as an impurity in chlorinated hydrocarbons,
- The Proposal does not identify a relationship between TCE (as an impurity) and perchloroethylene; and,
- With no *de minimis* exemption for TCE as an impurity, the proposal effectively eliminates AFPM members' ability to use perchloroethylene as a catalyst regenerator at petroleum refineries.

II. AFPM Interest in the Proposed Rule

AFPM is the leading trade association representing the manufacturers of the fuels that keep America moving and base petrochemicals that are the essential building blocks for organic chemistry, including plastic products that improve the health, safety, and living conditions of humankind and make modern life possible. AFPM members are committed to sustainably manufacturing safe, high-performing fuels and the petrochemicals and derivatives that growing global populations and economies need to thrive.

TCE is an impurity at trace amounts in perchloroethylene. AFPM members use perchloroethylene as a chloriding agent to regenerate catalysts that help make EPA-compliant fuels. If EPA moves forward with a broad ban of TCE and no exemptions for impurities, as outlined in the Proposed Rule, AFPM members will no longer be allowed to use perchloroethylene as a catalyst regenerator at petroleum refineries. The alternative chloriding agents, with the exception of chlorine gas, are also TSCA high-priority chemicals that EPA has determined present an unreasonable risk using the Agency's "whole chemical" approach.[2] Such a restriction would drastically and negatively impact U.S. refiners' ability to produce EPA-compliant fuels and have a dramatic impact on isomerate and reformate, which go into blends that make up 45 % of the gasoline pool, causing a very significant disruption in the national fuels supply chain.

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[1] See *88 Fed. Reg.* 74712, "Trichloroethylene (TCE); Regulation Under the Toxic Substances Control Act (TSCA)." EPA–HQ–OPPT–2020–0642; FRL–8317–01–OCSPP. Published October 13, 2023.

[2] Historically, EPA made separate unreasonable risk determinations for every condition of use of a chemical. EPA has recently decided to modify this approach when conducting risk assessments under TCSA. Per the EPA "[f]or the first 10 chemicals under TSCA and for any similar chemical that presents significant risks across many uses, EPA will continue to assess and analyze each condition of use, but then the agency plans to make the determination of unreasonable risk just once for the whole chemical when it is clear the majority of the conditions of use warrant one determination." EPA is referring to this as the "whole chemical approach" *See* also, https://www.epa.gov/newsreleases/epa-announces-path-forward-tsca-chemical-risk-evaluations.

III. Production of Perchloroethylene

In general, the production of chlorinated light hydrocarbons (those with only one or two carbons in the molecule, also referred to as chlorinated C1 – C2) is primarily through chlorination (reacted with chlorine gas) or oxychlorination (reacted with hydrochloric acid and oxygen). To minimize hazardous wastes, the residues from chlorinated light hydrocarbon production processes are recycled and used as feedstocks (inputs) for other chlorinated C1 – C2 processes. That is the case with all perchloroethylene produced in the United States.[3]

Perchloroethylene was initially produced as a byproduct of carbon tetrachloride manufacturing in the early 1900s.[4] The current production methods are chlorination of C1 – C3 recycled chlorinated residues from other hydrocarbon chlorination processes and oxychlorination of ethylene dichloride and recycled C2 chlorinated residues.[5] The resulting product stream in the perchloroethylene production unit is a fraction of various chlorinated C1 – C2 substances, such as methylene chloride, TCE, carbon tetrachloride, ethylene dichloride, etc., the individual components of which are separated. The separated individual component substances usually contain trace amounts of the other chlorinated substances found in that particular fraction.

IV. Perchloroethylene Use in Refining Processes

As stated in the previous section, domestically produced perchloroethylene can contain trace amounts of TCE. Perchloroethylene is used as a catalyst regenerator in isomerization and catalytic reforming processes at petroleum refineries. The resulting products from these processes, called isomerate and reformate, go into gasoline blends that make up approximately 45% of the gasoline pool in the United States.[6] The catalyst is critical to process safety because it allows the processes to run at lower reaction temperatures, which is an engineering control to lower the overall safety risk and reduce carbon dioxide emissions from the process. The catalysts also promote the formation of desirable products for EPA-compliant fuels.

Alternatives to perchloroethylene as a catalyst regenerator are all TSCA high-priority chemicals and have all been determined by EPA to have an unreasonable risk. The only other alternative, chlorine gas, is regulated under Department of Homeland Security and United States Coast Guard security regulations and switching to that substance would increase the overall security risk of the facility. Furthermore, switching from perchloroethylene, a liquid substance, to chlorine, a toxic gaseous substance, would also increase overall process safety risks.

Perchloroethylene must be replenished on a periodic basis and is transported to the facility by suppliers who take responsibility for their own employees, especially in the areas of training and personal protection. Transfer operations from shipping containers to storage and processing units are subject to United States Department of Transportation ("DOT") and

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[3] *Directory of Chemical Producers*, S&P Global Commodity Insight, accessed August 30, 2023.
[4] C. Barton, in *Encyclopedia of Toxicology* (Third Edition), 2014. Accessed through ScienceDirect.com on August 30, 2023.
[5] *Directory of Chemical Producers*, S&P Global Commodity Insight, accessed August 30, 2023.
[6] From Honeywell UOP (UOP) technical presentation to EPA on isomerization and reforming processes, and the use of PCE as a catalyst regenerator.

Occupational Safety and Health Administration ("OSHA") regulations. The predominant transportation methods are by tote or tank truck. If delivered by tank truck, the perchloroethylene is transferred from the truck into a storage tank that is directly hooked up to the processing unit for direct injection in a closed system. If by tote, then the tote is directly hooked up for direct injection in a closed system. The totes and tank trucks are returned to the supplier and are maintained by the supplier. Refinery workers do not clean or service the totes and tank trucks. Cleaning and servicing are performed by the supplier and those conditions of use are accounted for in other sections of the risk evaluation.

Perchloroethylene is used in continuous, closed processes, subject to multiple engineering controls to prevent exposures. As mentioned above, perchloroethylene is directly injected from a tote or storage tank into the closed processing unit. The tanks and totes are clearly labelled in accordance with OSHA hazard communications standards. Transfers of perchloroethylene from tank trucks to storage tanks and changeout of totes are performed pursuant to comprehensive written procedures under strict personal protective equipment ("PPE") guidelines that include hardhats, gloves, goggles and/or face shields, and when appropriate, respirators. Both OSHA and DOT prescribe material handling requirements, including the requirement to wear PPE and train employees on the safe handling of hazardous substances/materials. Those requirements are typically fulfilled by owner/operators for refinery personnel and by employers (e.g., contractors, vendors, etc.) for those who are not direct employees of the owner/operator. These regulations function effectively to mitigate the risks of exposure to perchloroethylene in refineries and it is inappropriate for EPA to assume noncompliance with these existing regulations.

Hoses to transfer perchloroethylene from the tank truck to the storage tank are sealed, creating a closed system for the transfer. The storage tank has a sealed pipe or hose that directly injects the perchloroethylene into the processing unit. Likewise, hoses that transfer perchloroethylene from totes to processing units are sealed, creating a closed system. The only way a worker could be exposed to perchloroethylene during transfer is from an accidental spill or leak from a hose, which is very unlikely and not considered a normal condition of use. Accident scenarios are covered under other OSHA, DOT, and EPA laws and should not be considered in a risk evaluation under TSCA § 6.

Data on perchloroethylene changeout confirms that EPA's exposure estimates in its risk evaluation are clearly erroneous. For example, EPA exposure models assume that changeout occurs 250 times per year; however, real world changeouts and potential exposure opportunities are significantly lower. Consider, per AFPM members that use perchloroethylene, on average, the frequency that totes are switched out is 10 to 35 times per year. The duration of each changeout is approximately 15 minutes. The frequency of tank truck changeouts is anywhere from 2 to 12 times per year, with an average duration between 30 and 60 minutes each time. The variability in frequencies is due to each refinery being different in design, layout, and processing capacity. The actual frequency of perchloroethylene replenishment shows how unrealistic EPA's use and exposure assumptions are for perchloroethylene as a catalyst regenerator at petroleum refineries. Since TCE is an impurity found in perchloroethylene in trace amounts, the risk to human health and the environment is negligible.

V. EPA Risk Evaluations of Perchloroethylene

EPA's final risk evaluation for PCE did not take into account the unique conditions of use in petroleum refineries; rather, it generalized the use as a processing aid and not specifically as a catalyst regenerator. In its exposure models, EPA assumed that accidental spills from hoses resulting in splashes to the skin occur 250 days per year (with one exposure event per workday). In EPA's modeling scenario that means an accidental spill occurs every day that PCE is used, and the exposed workers just leave it on their skin without washing it off. The Agency's assumptions ignore fundamental industrial hygiene practices and procedures required by OSHA to protect workers. EPA's modeling assumptions have no basis in reality and are arbitrary and capricious. AFPM, in joint comments with the American Petroleum Institute ("API"), expressed these and other concerns with the risk evaluation for perchloroethylene.[7]

VI. EPA Proposed Existing Chemical Exposure Limit

EPA is proposing an entirely new workplace exposure limit that is intended to supplant the current exposure limits established by other federal and state agencies. The concept of an Existing Chemical Exposure Limit ("ECEL") was developed solely by EPA and did not involve outside experts in toxicology and/or industrial hygiene. ECEL values have also been developed in a vacuum, bypassing normal stakeholder processes utilized by other federal agencies. The ECEL concept and development of threshold values were not even subject to notice and comment.

EPA is proposing an ECEL of 0.0011 parts per million ("ppm") for inhalation exposures to TCE as an 8-hour Time Weighted Average ("TWA"). The OSHA Permissible Exposure Limit ("PEL") is 100 ppm.[8] The American Conference of Government Industrial Hygienists ("ACGIH") threshold is 10 ppm and was established in 2007.[9] The Cal/OSHA PeEL, also established in 2007, is 25 ppm, lower than the OSHA PEL and equivalent to the National Institute for Occupations Safety and Health ("NIOSH") threshold.[10]

AFPM does not support the development or use of ECELs because the whole concept is duplicative and contradictive of existing federal standards and regulations. The Office of Pollution Prevention and Toxics ("OPPT") has very little expertise in industrial hygiene, which is reflected in the unreasonably low threshold values that are orders of magnitude below existing thresholds used throughout the world. The ECELs proposed thus far are so low that they challenge the levels of analytical detection, which makes verification next to impossible.

If EPA moves forward with its own threshold, it will likely confuse the regulated community as to which threshold should be followed. Instead, EPA should form a multistakeholder group of qualified scientists from the disciplines of toxicology and industrial

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[7] See Comments of AFPM and API on EPA's "Perchloroethylene (PCE); Draft Revision to Toxic Substances Control Act (TSCA) Risk Determination; Notice of Availability and Request for Comment." AFPM incorporates these comments by reference hereto.

[8] See *88 Fed. Reg.* 74712, "Trichloroethylene (TCE); Regulation Under the Toxic Substances Control Act (TSCA)." EPA–HQ–OPPT–2020–0642; FRL–8317–01–OCSPP. Published October 13, 2023. p. 74721.

[9] *Id*. at 74722.

[10] *Id*.

hygiene, in conjunction with OSHA and NIOSH, to review existing workplace exposure limits and determine if and how existing limits should change. Changes should be made according to established standards-setting approaches at OSHA and NIOSH.

VII. EPA Proposed Regulation of TCE

EPA is proposing a broad ban of TCE, with some uses being phased out more slowly than others. There is no mention of petrochemical manufacturing or petroleum refining in the Proposed Rule. EPA does request comment on "whether it should consider a de minimis level of TCE in formulations to account for impurities (e.g., 0.1% or 0.5%) when finalizing the prohibitions described in this unit, and, if so, information on and rationale for any level that should be considered de minimis."[11]

TCE is an impurity found in trace amounts in perchloroethylene sold in the United States. Since perchloroethylene is used as a catalyst regenerator in isomerization and reforming processes, the lack of a *de minimis* exemption would effectively ban the use of perchloroethylene (since all TCE uses are banned). This ban would have a dramatic impact on isomerate and reformate, which go into blends that make up 45 % of the gasoline pool, causing a very significant disruption in the national fuels supply chain.

AFPM strongly urges EPA to explicitly exempt TCE as an impurity or byproduct from all provisions of the rule. Without an explicit exemption there will be unintended consequences of duplicative and unnecessary regulation of an impurity in catalyst regenerators for which the Agency has already proposed significant risk management regulations. Worse yet, the Proposed Rule could result in significant disruption of the gasoline supply chain nationwide.

Users of chemical substances that contain TCE as an impurity or byproduct should also be explicitly exempt from the Workplace Chemical Protection Program ("WCPP"), especially in cases where the impure product is already subject to a WCPP. There is no justifiable reason to implement two separate WCPPs for one chemical substance because of an impurity. AFPM and its members offer to work with EPA to identify an appropriate *de minimis* threshold level for such an exemption.

VIII. Conclusion

AFPM appreciates the opportunity to comment on the proposed risk management rule for TCE. AFPM does not believe that the conditions of use from TCE as an impurity in perchloroethylene catalyst regenerators pose an unreasonable risk. EPA must ensure that it does not inadvertently prohibit the use of perchloroethylene as a catalyst regenerator because of unintended consequences from a TCE risk management rule. AFPM respectfully requests to work with EPA to establish an appropriate de minimis level for TCE. AFPM looks forward to further dialog.

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[11] *Id*. at 74733.

Sincerely,

James Cooper
Senior Petrochemical Advisor