BACWA
BAY AREA
CLEAN WATER
AGENCIES

May 10, 2022

Sarah Swenson
Office of Chemical Safety and Pollution Prevention (7201M)
Environmental Protection Agency (EPA)
1200 Pennsylvania Ave. NW
Washington, DC 20460–0001

Via docket: https://www.regulations.gov/commenton/EPA-HQ-OPPT-2022-0218-0001

**Subject: Toxic Substances Control Act (TSCA) Collaborative Research Program to Support New Chemical Reviews (EPA-HQ-OPPT-2022-0218-0001)**

Dear Ms. Swenson:

On behalf of the Bay Area Clean Water Agencies (BACWA), we thank you for the opportunity to comment on Toxic Substances Control Act (TSCA) Collaborative Research Program to Support New Chemical Reviews. BACWA's members include 55 publicly-owned wastewater treatment works (POTWs) and collection system agencies serving 7.1 million San Francisco Bay Area residents. We take our responsibilities for safeguarding receiving waters seriously. BACWA members have been sharing the latest in wastewater publications and providing science-based comments to EPA for over twenty years.

BACWA supports the EPA Office of Chemical Safety and Pollution Prevention (OCSPP) inter-departmental effort to "*bring innovative science to new chemical reviews, modernize the approaches used, and increase the transparency of the human health and ecological risk assessment process.*" (*Federal Register Notice, Vol. 87, No. 38*) BACWA would like to provide comments on EPA's Toxic Substances Control Act (TSCA) Collaborative Research Program to Support New Chemical Reviews Key Area #3: Develop and Refine QSAR and Predictive Models for Physical-Chemical Properties, Environmental Fate/Transport, Hazard, Exposure, and Toxicokinetics. (*Modernizing the Process and Bringing Innovative Science to Evaluate New Chemicals Under TSCA Problem Statement, Vision and Research Action Plan for Public Comment*, March 9, 2022, p. 6)

We appreciate that TSCA is reviewing environmental models as part of this process. Robust environmental modeling is a cornerstone of the TSCA process managed by EPA's Office of Pollution Prevention and Toxics (OPPT) as well as the pesticide registration review process performed by EPA's Office of Pesticide Programs (OPP). Improvements made to EPA's models will result in improved modeling for the OPPT TSCA process as well as the OPP registration and registration review processes. BACWA requests that EPA's down-the-drain (DTD) modeling be evaluated as part of this process. We hope that OPPT will include the DTD model on its research agenda.

**Background**

Every day, BACWA members treat millions of gallons of wastewater that is then discharged to fresh or saltwater bodies, including local creeks and rivers, bays, and the Pacific Ocean. These waterways provide crucial habitat to a wide array of aquatic species and waterfowl. In some cases, waters receiving POTW discharges ("receiving waters") may be effluent-dominated in that there is little to no dilution, either because the receiving water is small or there is a lack of mixing at certain times due to thermal or saline stratification.

Many chemicals have high aquatic toxicity and proven ability to pass through POTWs and appear in our effluent. Omitting evaluation of the sewer discharge environmental exposure pathway can prove costly for POTWs, as detailed below.

As municipal wastewater treatment facilities have few (if any) realistic local options to control use of chemicals in consumer products, it is essential to us that EPA implement mitigation measures ensuring that impacts to the beneficial uses of the receiving water are prevented. This is not just a California issue –Clean Water Act standards, such as the toxicity standards that drive our interest in pesticides and other toxic chemicals, affect POTWs across the entire nation.

**Toxic Chemical Discharges to the Sewer Can Be Costly**

Toxic chemical discharges to the sewer system can prove costly for POTWs, due to the potential for chemicals to cause or contribute to wastewater treatment process interference, NPDES Permit compliance issues, impacts to receiving waters, recycled water quality and/or biosolids reuse, in addition to exposing POTWs to the potential for third party lawsuits under the Clean Water Act.

Of particular concern is the ability of a specific chemical to exceed effluent toxicity limits. One universal water quality standard in the U.S., which stems directly from the Federal Clean Water Act, is that surface waters cannot be toxic to aquatic life. NPDES permits require POTWs to demonstrate that they meet this standard by evaluating toxicity using EPA standard methods (set forth in 40 CFR Part 136). To evaluate toxicity, every POTW must (1) conduct toxicity screening tests with a range of species, (2) select the most sensitive species, and (3) perform routine monitoring. These monitoring data are used to determine whether the discharger has a reasonable potential to cause or contribute to toxicity in the receiving water. If it does, the CWA requires that numeric effluent limits be imposed, otherwise POTWs may be given numeric effluent triggers for further action. In the event that routine monitoring does exceed a toxicity limit or trigger, the POTW must perform accelerated monitoring (e.g., monthly); and if there is still evidence of consistent toxicity, the discharger must do a Toxicity Reduction Evaluation (TRE) to get back into compliance. The TRE requires dischargers to evaluate options to optimize their treatment plants and conduct a Toxicity Identification Evaluation (TIE), the cost of which can vary from $10,000 to well over $100,000 depending on complexity and persistence of the toxicant. The goal of the TIE is to identify the substance or combination of substances causing the observed toxicity. If a POTW's effluent is toxic because of a chemical pollutant, it may not have any practical means to comply with Clean Water Act-mandated toxicity permit limits.

Once identified, the cost to treat or remove the toxicity causing compound(s) can vary dramatically. Often, there are few ways for a discharger to mitigate the problem other than extremely costly treatment plant upgrades. Upgrading treatment plants is an extremely expensive and slow process; for example, the Sewer System Improvement Project of the San Francisco Public Utilities Commission is a 20-year and $2+ billion undertaking. Upgrading treatment plants is also often ineffective for organic chemicals that appear at sub microgram per liter concentrations, largely because sewage is a complex mixture of natural organic compounds. Regardless of this, the discharger must comply with its Clean Water Act permit limits. If a discharger violates a toxicity limit, it can be subject to significant penalties (in California up to $10/gallon or $10,000 per day).

Case in point, a POTW in San Rafael, California, serving a community of 30,000 residents with a discharge of about 3 million gallons a day, observed toxicity in 21 of 28 samples several years ago. In one sample, the toxicity was 8 times the threshold to be considered toxic. The facility conducted a TIE and identified that the likely cause of the toxicity was toxic chemicals – specifically pyrethroid insecticides. Follow-up investigations identified that permethrin was present at low concentrations in the wastewater. EPA (in its Clean Water Act oversight role) subsequently required that toxicity limits be imposed upon reissuance of the permit. The cost to this small community and the resources required of the local water regulatory agency are precisely what we seek to avoid in the future for all toxic chemicals.

In addition, when surface water bodies become impaired by toxic chemicals, wastewater facilities may be subject to additional requirements established as part of Total Maximum Daily Loads (TMDLs) set for the water bodies by EPA and state water quality regulatory agencies. For example, a number of pesticide-related TMDLs have been adopted or are in preparation in California. The cost to wastewater facilities and other dischargers to comply with TMDLs can be up to millions of dollars per water body per pollutant. This process will continue as long as toxic chemicals are used in products and manners that result in water quality impacts. It is therefore imperative that EPA addresses water quality impacts in both its TSCA and pesticides chemicals programs and for EPA to take action to ensure that any impacts are prevented or fully mitigated.

**Improvements to the Down-the-Drain model benefit both the TSCA and OPP chemicals evaluations**

BACWA has several suggestions for how EPA can improve its “down-the-drain” model for indoor chemical use.

As context, because 100% of POTWs must comply with the Federal Clean Water Act 100% of the time, it is imperative for EPA to avoid underestimating chemical discharges and associated risks. To accurately assess risks requires addressing both fresh and saltwater discharges and modeling of a reasonable worst case–not average–conditions.

U.S. EPA OPP uses the TSCA program’s “down-the-drain” module from the E-FAST model to estimate surface water concentrations associated with wastewater pesticide discharges. BACWA has reviewed many dozens of OPP risk evaluations that use this modeling. We have identified a set of common shortcomings that make the modeling inaccurate, usually by significantly underestimating environmental concentrations and/or omitting environmental exposures.

BACWA recommends the following refinement for the modeling of indoor chemical use, discharge, and transport through a sanitary sewer to a water body:

1) Adjust consumer product discharge estimates to reflect geographic and seasonal use
2) Update per capita water use to account for conservation
3) Assume zero dilution
4) Improve POTW removal estimates
5) For chemicals likely to partition to sediment, include a biosolids analysis

**1) Adjust Consumer Product Discharge Estimates to Reflect Geographic and Seasonal Use**

For the discharge of consumer products to a sewer, the default approach for the E-FAST DTD model involves assuming 100% discharge of the annual manufacturing production volume of the chemical and equal discharge throughout all US households. While this approach could be useful for screening purposes; it is unreasonable for many categories of chemicals. For some chemicals, this approach grossly overestimates sewer discharges, as many uses of some chemicals do not entail sewer discharges. For other chemicals – particularly those with seasonal or geographically episodic use, this approach grossly underestimates discharges

For example, for pet flea control products, usage is not consistent throughout the year or across the nation, as flea pressure differs based on geography and by season. Flea pressure is low during freezing winters and highest in late summer. Geographic areas with climates most conducive to flea reproduction (e.g., mild weather coastal areas) experience the highest flea pressure. And, while veterinarians typically recommend regular use of topical treatments, consumers often seek treatments upon identifying a flea outbreak. Monitoring data for common pet flea control chemicals reflect this variation in use, with the highest concentrations measured in wastewater effluents in the southwestern US in the late summer.

**2) Update Per Capita Water Use to Account for Conservation**

The overall daily water use in a household dilutes the concentration of chemicals entering the sanitary sewer. The water use default in the E-FAST DTD model appears to be significantly greater than currently observed per capita water use in many of the nation's urban areas. Particularly in regions of the US that are impacted by drought, the influent flow volume to POTWs has reduced significantly since the 1990s, due to conservation, national and state code requirements for installation of low-flow toilets and showerheads, and new high-efficiency washing machines (see table). BACWA recommends that EPA consider using 5th or 10$^{th}$ percentile per capita flows to be sufficiently conservative in the model analysis.

| Location | Per Capita Daily Water Use (liters) | Source |
|---|---|---|
| E-FAST DTD Model | 364 (original)<br>388 (current) | 1990 and 1996 EPA POTW surveys[1] |

[1] Versar (1999). Exposure and Fate Assessment Screening Tool (E-FAST) Beta Version Documentation Manual prepared for U.S EPA OPPTS; Versar (2007). Exposure and Fate Assessment Screening Tool (E-FAST) Version 2.0 Documentation Manual. Prepared for U.S. EPA OPPTS.

| Location | Per Capita Daily Water Use (liters) | Source |
|---|---|---|
| California, January 2022 (includes outdoor uses) | 250 | California State Water Board[2] |
| Texas, 2012 | 230 | Texas Water Development Board[3] |

**3) Assume Zero Dilution**

The E-FAST model manual notes that a range of dilution factors may be employed when analyzing POTW impacts to receiving waters: "Measured dilution factors are typically between 1 (representing no dilution) and 200 and are based on NPDES permits or regulatory policy."[4] BACWA recommends that its chemicals modeling analysis assume no dilution, to avoid omitting environmental exposures associated with surprisingly common zero-dilution POTW discharges.

In California, approximately 20 percent of NPDES permits provide for no dilution. Throughout the US, about 23 percent of POTWs have a permitted dilution factor less than 10. Further, treated wastewater effluent makes up more than 90 percent of stream flow for 49 percent of a representative sample of major POTWs in Texas, Oklahoma, New Mexico, Arkansas, and Louisiana.[5] In the case of multiple sanitary sewer systems and/or urban and agricultural runoff discharging into the same water body, the "diluting" waters may also contain the pollutant.

**4) Improve POTW Removal Estimates**

Because there is variety in POTW treatment trains, with different types and levels of treatment, and different detention times, chemical removal rates are expected to vary from facility to facility. Rather than use an average removal rate, consider using a range of removal rates to determine whether certain treatment trains might be more at risk of permit violation.

As noted by Sutton et al. (2019)[6], the E-FAST model relies on removal predictions based solely on physical and chemical properties rather than chemical-specific removal studies. This approach can introduce inaccuracies in modeling. For example, Parry and Young (2013)[7] measured the distribution of pyrethroids in secondary treated effluent and found additional settling time would not result in improved removal efficiency. The observed association between pyrethroids and dissolved organic matter present in wastewater may account for the over-predicted removal of

[2] California water usage data are available online: http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.shtml January 2022 data, which are during the rainy season in California's Mediterranean climate and thus reflect minimal outdoor water use, are typically used to estimate indoor water use and wastewater discharges.

[3] Hermitte, S.M. and Mace, R.E. (2012). *The Grass Is Always Greener…Outdoor Residential Water Use in Texas*. Texas Water Development Board, Technical Note 12-01.

[4] Versar (2007). Exposure and Fate Assessment Screening Tool (E-FAST) Version 2.0 Documentation Manual. Prepared for U.S. EPA OPPTS. Page 3-33.

[5] Brooks et al. (2006). Water quality of effluent-dominated ecosystems: ecotoxicological, hydrological, and management considerations. *Hydrobiologia* **556:**365–379.

[6] Sutton, R., Xie, Y., Moran, K., & Teerlink, J. (2019). Occurrence and Sources of Pesticides to Urban Wastewater and the Environment. In K. Goh (Ed.), Pesticides in Surface Water: Monitoring, Modeling, Risk Assessment, and Management (pp. 63-88). Washington, DC: American Chemical Society.

[7] Parry, E.; Young, T. M. Distribution of Pyrethroid Insecticides in Secondary Wastewater Effluent. Environ. Toxicol. Chem. 2013, 32, 2686–2694.

pyrethroids by the E-FAST model (DPR 2017)[8].

**5) For Chemicals Likely to Partition to Solids, Include a Biosolids Analysis**

Many chemicals are likely to partition into solids. Therefore, BACWA requests that EPA include an evaluation of the adsorption and partitioning to the POTW biosolids. The E-FAST DTD model assumes that the biosolids (referred to as "sludge") are landfilled. This assumption does not reflect the routine use of biosolids as a soil amendment in agriculture, gardens, parks, and reclamation sites. POTWs have come to consider biosolids to be valuable resource. Furthermore, in California, biosolids disposal in landfills is increasingly restricted in order to reduce methane emissions. It is important to understand how the partitioning of toxic chemicals into biosolids could impact the value and end uses of this resource.

Since the DTD model was created, decades of advancement in wastewater science has occurred. BACWA hopes that EPA will undertake a full review and modernization of this model based on this published scientific data.

Thank you for your consideration of our comments. If you have any questions, please contact BACWA's Project Managers:

Karin North
City of Palo Alto
(650) 329-2104
Karin.north@cityofpaloaloalto.org

Robert Wilson
City of Santa Rosa
(707) 543-4369
rwilson@srcity.org

Respectfully Submitted,

Lorien Fono, Ph.D., P.E.
Executive Director
Bay Area Clean Water Agencies

cc:

Ya-Wei Li, Deputy Assistant Administrator for Pesticide Programs, EPA
Maureen Gwinn, Acting Assistant Administrator, Principal Deputy Assistant Administrator for Research and Development, ORD, EPA

---

[8] DPR (California Department of Pesticide Regulation). Comment Letter: U.S. Environmental Protection Agency Ecological Risk Assessment and Registration Review Of Pyrethroids And Pyrethrins (Bifenthrin, Cyfluthrins (& Beta), Cypermethrin (Alpha & Zeta), Cyphenothrin, D-Phenothrin, Deltamethrin, Esfenvalerate, Etofenprox, Fenopropathrin, Flumethrin, Gamma-Cyhalothrin, Imiprothrin, Lambda-Cyhalothrin, Momfluorothrin, Permethrin, Prallethrin, Pyrethrins, Tau-Fluvalinate, Tefluthrin, Tetramethrin (Docket Identification Numbers: EPA-HQ- OPP-2010-0384, EPA-HQ-OPP-2010-0684, EPA-HQ-OPP-2012-0167, EPA-HQ-OPP-2009-0842, EPA-HQ-OPP-2011-0539, EPA-HQ-OPP- 2009-0637, EPA-HQ-OPP-2009-0301, EPA-HQ-OPP-2007-0804, EPA-HQ-OPP2010-0422, EPA-HQ-OPP-2016-0031, EPA-HQ-OPP-2010- 0479, EPA-HQ-OPP-2011-0692, EPA-HQ-OPP-2010-0480, EPA-HQ- OPP-2015-0752, EPA-HQ-OPP-2011-0039, EPA-HQOPP-2011-1009, EPA-HQ-2011-0885, EPA-HQ-OPP-2010-0915, EPA-HQ-OPP-2012-0501, EPA-HQ-OPP-2011-0907); DPR Environmental Monitoring Branch, 2017.

Chris Robbins, Deputy Assistant Administrator for Management, ORD, EPA
Chris Frey, Deputy Assistant Administrator for Science Policy, ORD, EPA
Bruce Rodan, Associate Director for Science, ORD, EPA
Edward Messina, Director, EPA Office of Pesticide Programs
Andrew Sawyers, Director, EPA Office of Water, Office of Wastewater Management
Tomas Torres, Director, Water Division, EPA Region 9
Patti TenBrook, EPA Region 9
Rochelle Cameron, EPA Region 9
Karen Mogus, Deputy Director, California SWRCB
Philip Crader, Assistant Deputy Director, California SWRCB
Rich Breuer, California SWRCB
Tom Mumley, California RWQCB SF Bay Region
Alessandra Moyer, California RWQCB, SF Bay Region
James Parrish, California RWQCB, SF Bay Region
Rebecca Nordenholt, California RWQCB, SF Bay Region
Jennifer Teerlink, California Department of Pesticide Regulation
Aniela Burant, California Department of Pesticide Regulation
Chris Hornback, Chief Technical Officer, National Association of Clean Water Agencies
Cynthia Finley, Director, Reg. Affairs, National Association of Clean Water Agencies
BACWA Executive Board
BACWA Pesticides Workgroup