

Microplastics Regulatory Developments at the State Level



April 8, 2024

Jared Voskuhl

CASA Director of Regulatory Affairs

Presentation Overview



- 1) CASA Background
- 2) California Regulatory Backdrop
- 3) California Regulatory Initiatives
- 4) Challenges of Sampling for Microplastics in Wastewater Media



1) CASA Background



California Association of Sanitation Agencies

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**Influencing regulatory,
legislative and legal issues**

CASA represents 135+ agencies and municipalities that provide wastewater collection, treatment, recycling, and resource recovery services

1) CASA Background



Legislative

State Legislative Committee

Federal Legislative Committee

Regulatory

Workgroups

Water Quality

Air Quality, Climate Change, and Energy

Biosolids

Legal

Attorneys Committee

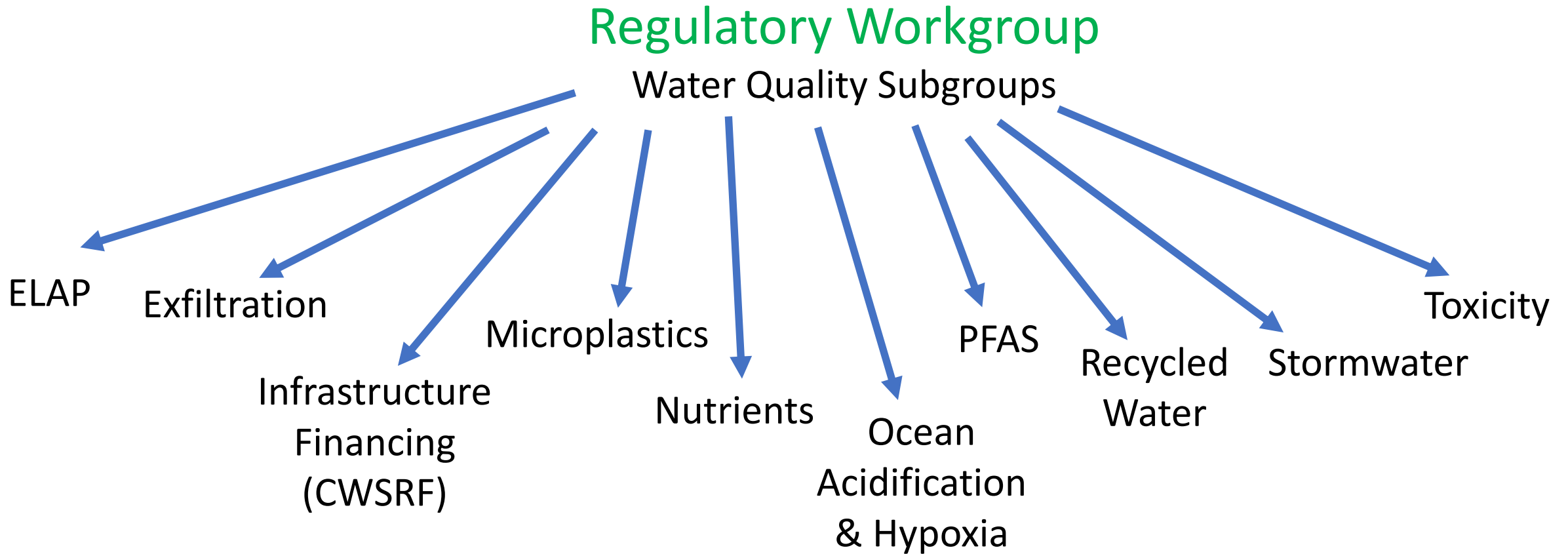
Collection Systems

<https://casaweb.org/about-us/workgroups/>

<https://casaweb.org/legislation/state-legislation/>

<https://casaweb.org/legal-and-regulatory/legal-advocacy/>

1) CASA Background



1) CASA Background

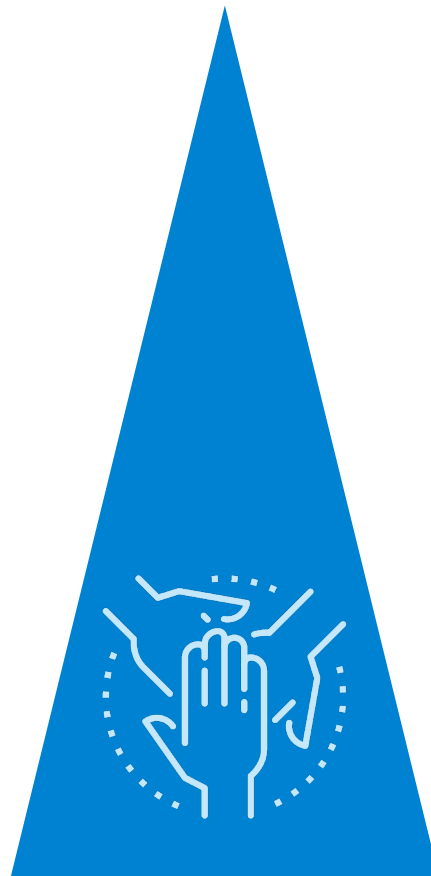


Pollution
Prevention

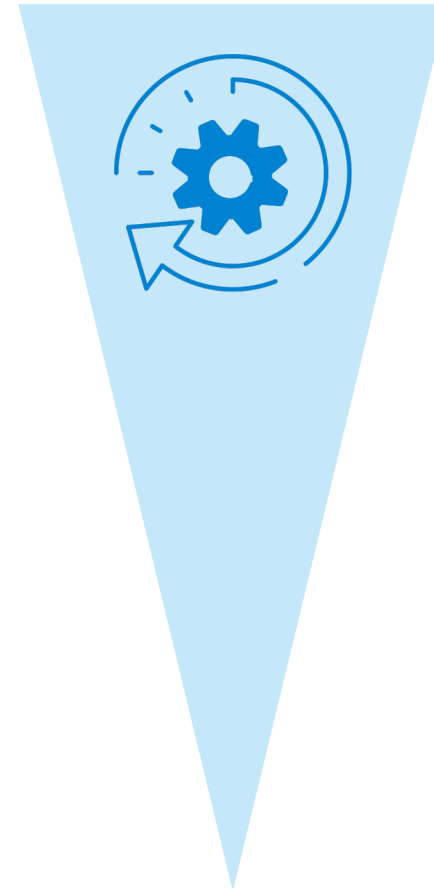


Remediation

Societal
Cost



Efficacy



2) California Regulatory Backdrop



Branches at the California Environmental Protection Agency



2) California Regulatory Backdrop



Branches at the California Natural Resources Agency



2) California Regulatory Backdrop



Human Health Impacts: Extreme Uncertainties (2019)

“Although there is insufficient information to draw firm conclusions on the toxicity related to the physical hazard of plastic particles, particularly the nano size particles, no reliable information suggests it is a concern through drinking-water exposure.”

– World Health Organization (2019)



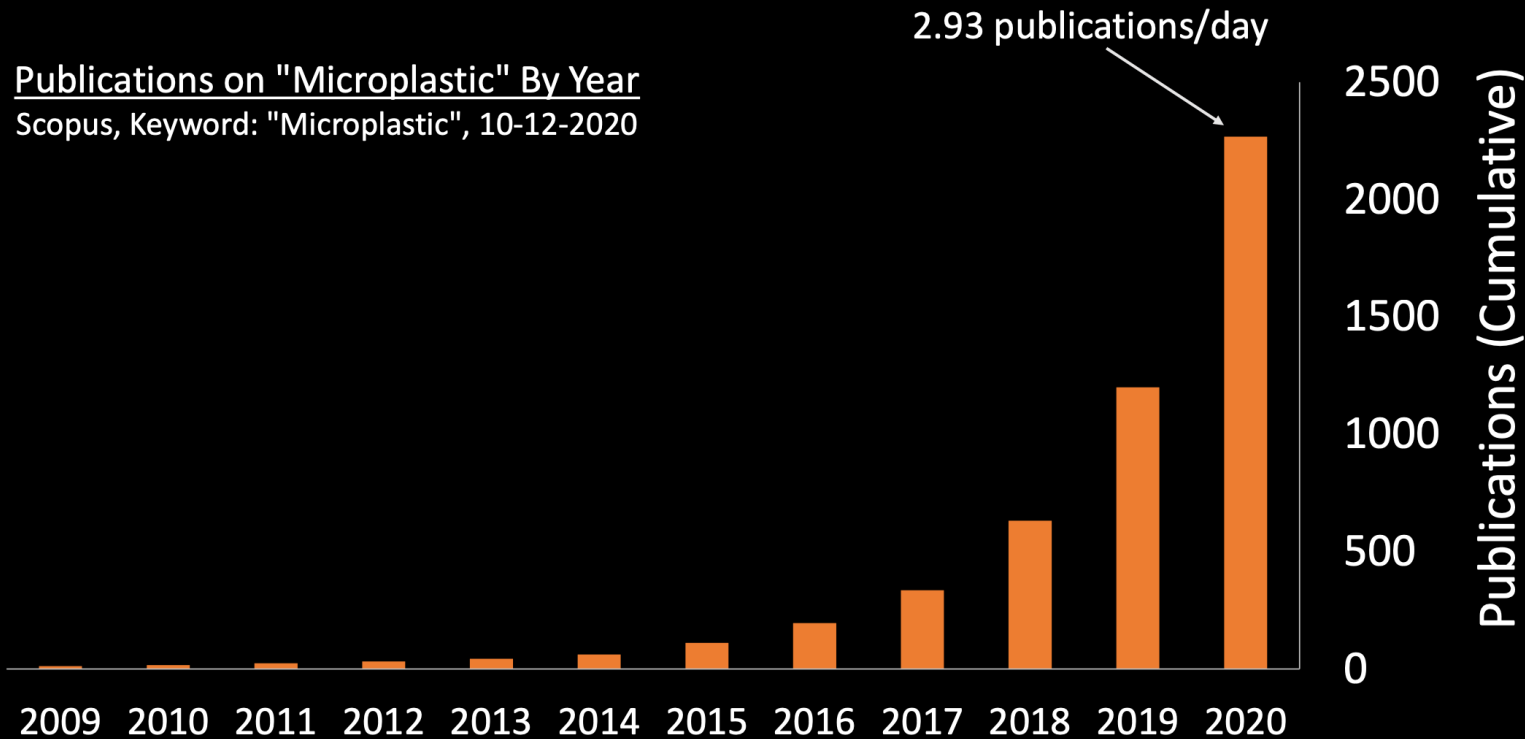
From 10/19/20 [Presentation](#) by Dr. Scott Coffin

2) California Regulatory Backdrop



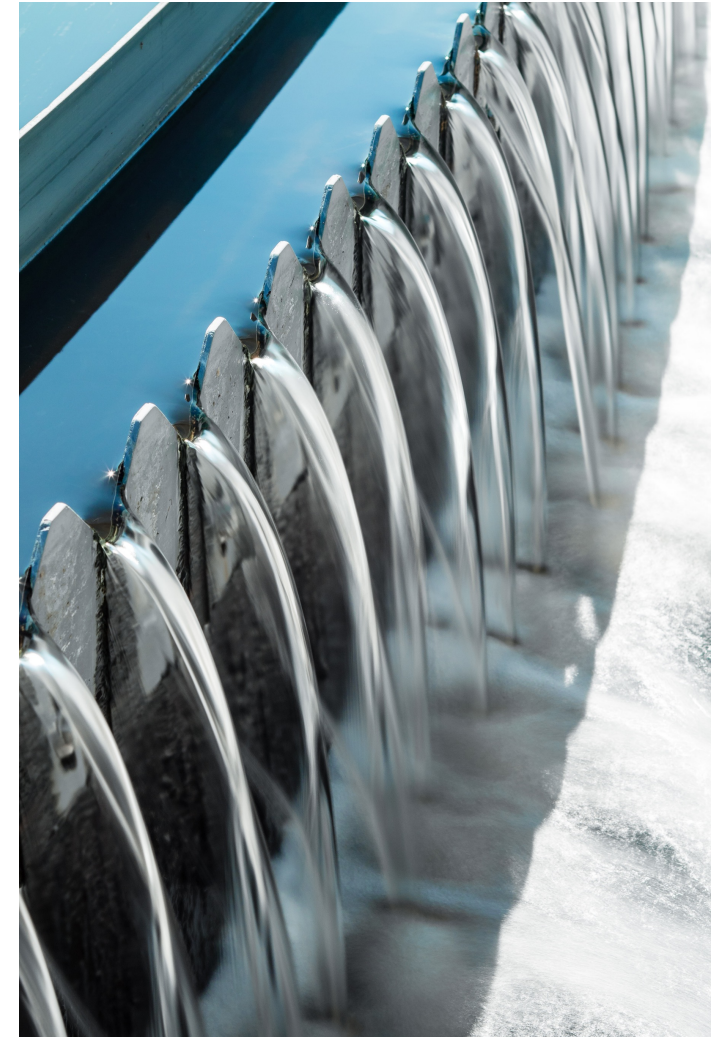
~2x Publications Since 2019 WHO Report

Publications on "Microplastic" By Year
Scopus, Keyword: "Microplastic", 10-12-2020



9

From 10/19/20 [Presentation](#) by Dr. Scott Coffin

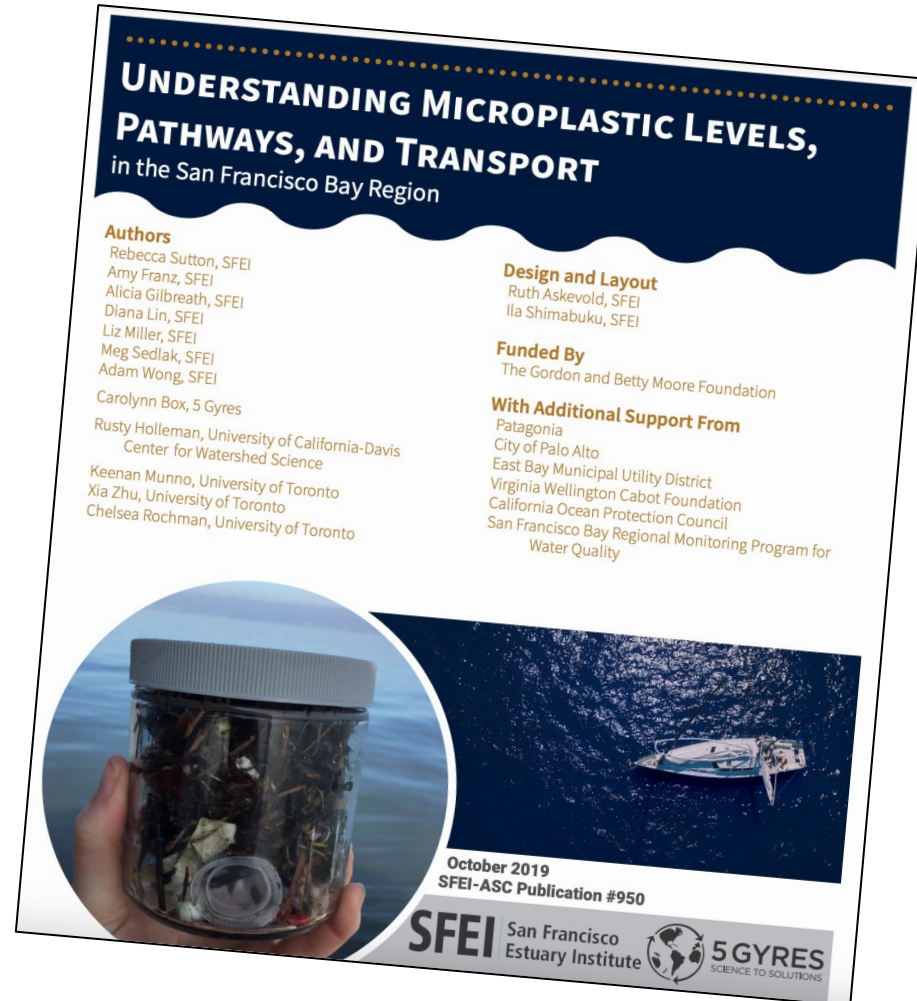


2) California Regulatory Backdrop



SFEI's 2019 Report Microplastics in the Bay

“a plastic polymer that is 1% of the stormwater microplastic load would be three to five times greater than the entire wastewater microplastic load” p. 59



Available online [here](#)

3) California Regulatory Initiatives



Regulatory Initiatives

SB 1263 & SB 1422

OPC WWTP Study (2020)

SWRCB Definition in Water (2021)

OPC Risk Assessment Framework (2021)

OPC Statewide MP Strategy (2022)

DTSC Candidate List

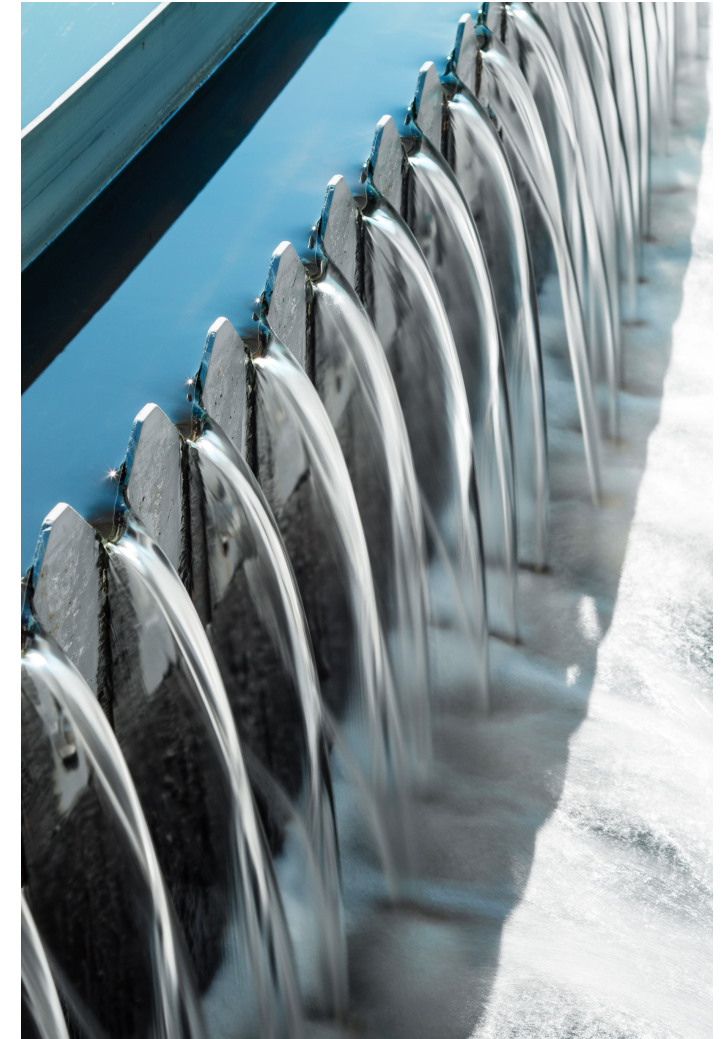
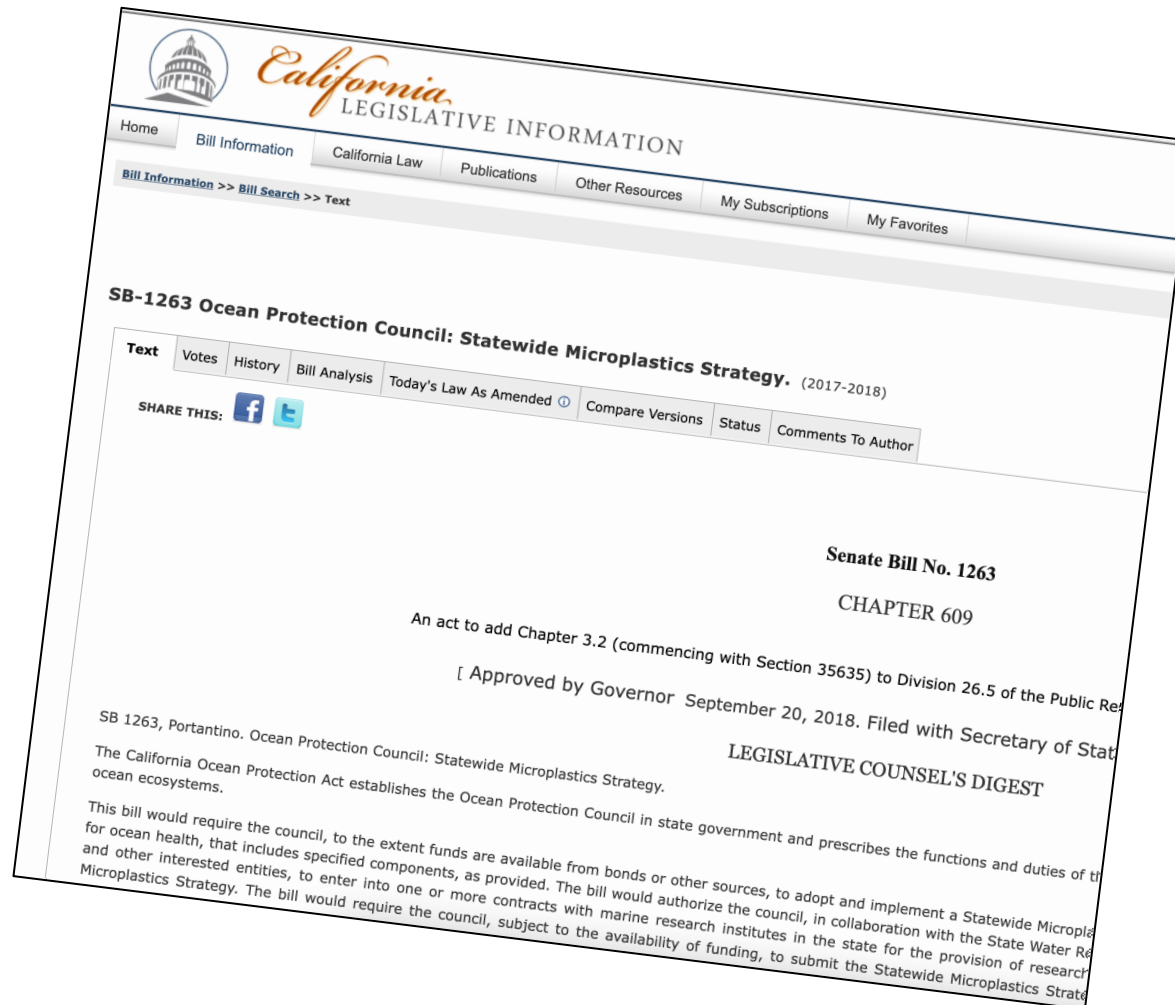
SWRCB 303(d) List (2024)

3) California Regulatory Initiatives



SB 1263 (2018)

Requires a statewide microplastics strategy that entails numerous critical elements for management.



California Regulatory Backdrop



SB 1263 (2018)


- (1) A prioritized research plan to support the development of risk assessments
- (2) Standardized methods for sampling, detecting, and characterizing microplastics
- (3) Characterization in the marine environment of ambient concentrations
- (4) Assessment of environmental impacts by particle age, size, shape, and type
- (5) Investigation of the sources and pathways relative importance
- (6) Development of a risk assessment framework for microplastics
- (7) Evaluation of source reduction and product stewardship techniques
- (8) Recommendations for policy and statutory changes



3) OPC WWTP Study (2020)



Wastewater treatment effectiveness study in June 2020

 **OCEAN PROTECTION COUNCIL**

Wade Crowfoot | Secretary for Natural Resources | Council Chair
Jared Blumenfeld | Secretary for Environmental Protection
Betty Yee | State Controller | State Lands Commission Chair
Ben Allen | State Senator
Mark Stone | State Assemblymember
Michael Brown | Public Member
Jordan Diamond | Public Member

Staff Recommendation
June 19, 2020

Item 9

Consideration of Authorization to Disburse Funds to Address Microplastics in Coastal and Marine Ecosystems
Holly Wyer, Program Manager

RECOMMENDED ACTION: Authorization to disburse up to \$120,233 to the San Francisco Estuary Institute to identify potential sources and pathways of microplastics in stormwater; and to disburse up to \$225,236 to the Southern California Coastal Water Research Project Authority to conduct a study assessing the efficacy of microplastic removal with various wastewater treatment methods.

LOCATION: Statewide

STRATEGIC PLAN OBJECTIVE: 3.4. Improve Coastal and Ocean Water Quality; Target 3.4.4 – Develop a Statewide Microplastics Strategy

EXHIBITS:
Exhibit A: Letters of Support for Project 9a
Exhibit B: Letters of Support for Project 9b

FINDINGS AND RESOLUTION:
Staff recommends that the Ocean Protection Council (OPC) adopt the following findings:
“Based on the accompanying staff report and attached exhibit(s), OPC hereby finds that:
1) The proposed projects are consistent with the purposes of Division 26.5 of the Public Resources Code, the Ocean Protection Act;
2) The proposed projects are consistent with OPC’s Proposition 84 grant

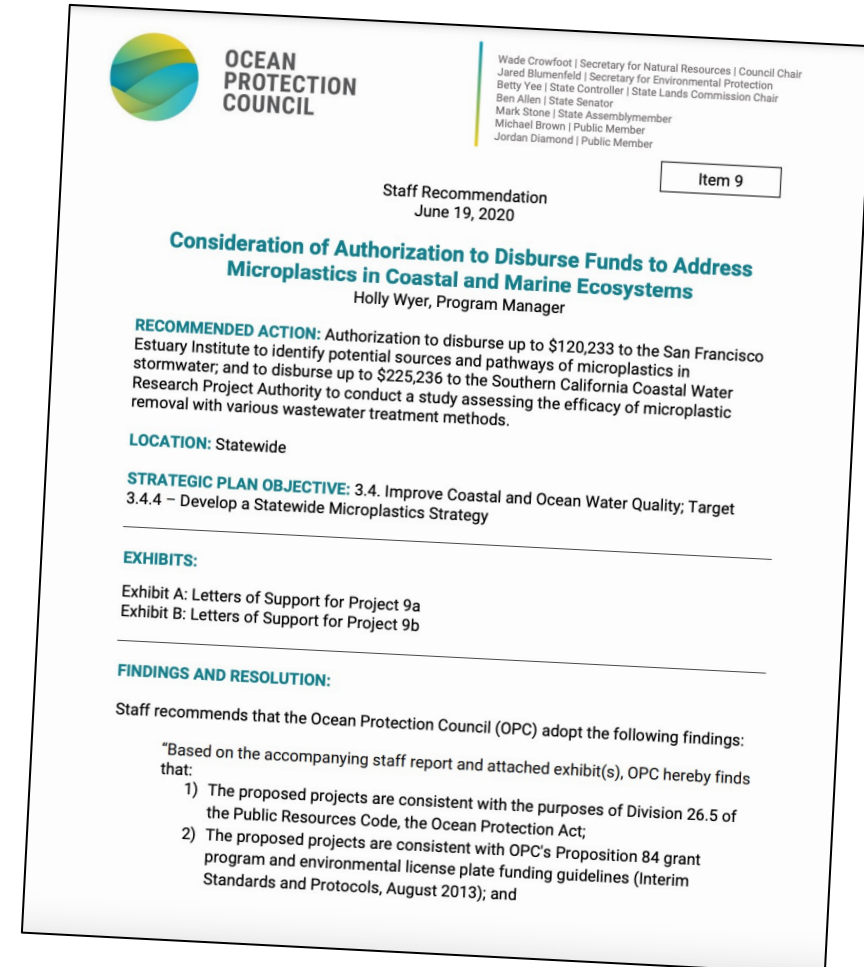


Available online [here](#)

3) OPC WWTP Study (2020)




- **June 2020:** Discussion with OPC staff about intent of project
- **February 2021:** Comment Letter to SCCWRP
- **Spring 2021:** Multiple CASA & SCCWRP Meetings to determine and Settle upon study design
- **July - December 2021:** Pilot of Sampling plan, development of instructional video by Central San
- **Winter 2022:** Refinement of Sampling plan & Development of Add-on study
- **Summer 2022 Winter 2023:** Commencement of sampling
- **April 2024:** Final report forthcoming



3) SWRCB Adopts Definition (2021)



 **Media Release**

State Water Board creates world's first standardized methods for testing microplastics in drinking water

New standards seen as crucial to Board's four-year testing plan

December 6, 2021 Contact: Blair Robertson
Blair.Robertson@Waterboards.ca.gov

SACRAMENTO – With concerns mounting over the potential impacts microplastics may have on the environment and human health, the State Water Resources Control Board, in partnership with the Southern California Coastal Water Research Project, has developed the first standardized analytical methods in the world for the testing and reporting of microplastics in drinking water.

Senate Bill 1422 requires the State Water Board to adopt a [definition of microplastics](#) and then create a standard methodology for the testing of drinking water for microplastics. The bill also requires four years of testing and reporting of microplastics in drinking water, including public disclosure of those results.

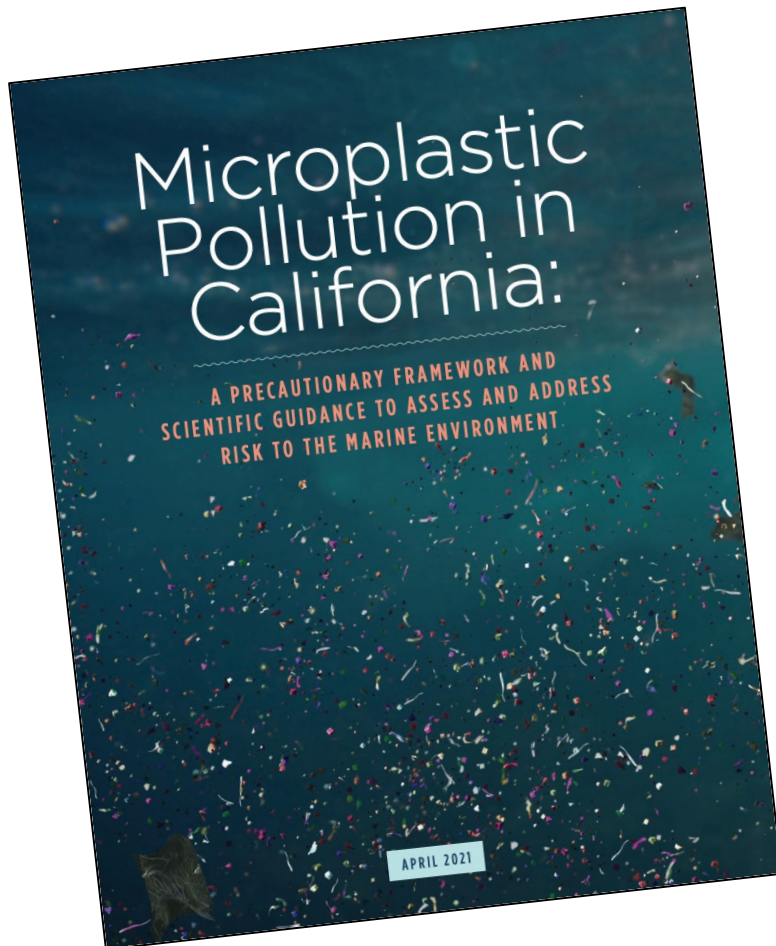
Microplastics – tiny plastic particles that can find their way into water supplies and into the air we breathe – have only recently received mainstream attention as a major environmental challenge. Despite their ubiquitous presence globally, much remains unknown about these particles that don't disappear over time. The board is already investigating the presence of another major group of long-lasting chemicals, per- and polyfluoroalkyl substances (PFAS), which are also known as "forever chemicals". PFAS and microplastics are similar in their diversity of characteristics and chemical compositions, their inability to break down in the environment, and their widespread use and contamination. However, unlike PFAS, microplastics occur predominantly as particles in the environment, therefore requiring distinct and new approaches to characterize and manage their contamination.

"Now that we can measure microplastics consistently from one lab to the next, we have the foundation to begin gathering data and determining the impacts," said E. Joaquin Esquivel, chair of the State Water Board. "Having the first standardized method in the

2021
Definition is
used across
environmental
media, not
just drinking
water



3) OPC Risk Assessment Framework (2021)



Risk Assessment
Framework published in
April 2021



Available online [here](#)

3) OPC Statewide Strategy (2023)



Statewide Microplastics
Strategy adopted in
February 2022



Available online [here](#)

3) DTSC Candidate List (2023)



Proposal to Add Microplastics to the Candidate Chemicals List

Virtual Public Workshop: June 27, 2023, from 9:00 AM to Noon, Pacific Standard Time

WHAT IS DTSC PROPOSING?

The Department of Toxic Substances Control's (DTSC's) Safer Consumer Products (SCP) Program is proposing to add microplastics (MPs) to its [Candidate Chemicals List](#).

WHY IS DTSC CONSIDERING THIS ACTION?

There is growing concern over the potential adverse impacts of MPs released to the environment (Koelmans et al. 2019; Suaria et al. 2020; Wong et al. 2020; Brahney et al. 2021). MPs are ubiquitous in the environment, and both humans and animals are exposed to them. Further, there is an emerging body of evidence suggesting that these exposures may be harmful (Toussaint et al. 2019; Mohamed Nor et al. 2021; Coffin et al. 2022).

In its [2021-2023 Priority Product Work Plan](#), DTSC identified five special considerations for evaluating products, including the "potential for the product to release MPs to the environment during the use or end-of-life stages of the product's life cycle." DTSC is currently limited to considering MPs only if they are contained in products that are selected for evaluation because they contain other chemicals that are on the Candidate Chemicals List. Adding MPs to the Candidate Chemicals List would allow DTSC to evaluate products strictly because they contain MPs or may release MPs to the environment. This concept was presented to SCP's [Green Ribbon Science Panel](#) (GRSP) for consideration on November 5, 2021, and the panel generally expressed support.

DO MPs MEET THE DEFINITION OF A CHEMICAL?

Yes. Within the framework of the SCP Regulations, "chemical" is broadly defined as "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."¹ The regulations specify that "molecular identity" may be described in terms of a substance's particle size, size distribution, and surface area. DTSC is basing its proposed definition for MPs (see below) on the polymeric structure and size distribution (< 5,000 microns) of MPs.

¹ See Cal. Code Regs. tit. 22, section 69501.1(a)(20)(A)(1).

“There is growing concern over the potential adverse impacts of MPs released to the environment. MPs are ubiquitous in the environment, and both humans and animals are exposed to them. Further, there is an emerging body of evidence suggesting that these exposures may be harmful.”

https://dtsc.ca.gov/wp-content/uploads/sites/31/2023/04/Background-Document-Proposal-to-Add-Microplastics-to-the-Candidate-Chemical-List_May272023.pdf

3) SWRCB Integrated Report – Thresholds for TMDLs (2024)



2024 Integrated Report Final Staff Report

“The threshold used to evaluate microplastic data is 5 microplastic particles per liter, which is an HC5 threshold for food dilution effects based on organismal and population scale toxicity test endpoints that was developed by an expert group as described in Mehinto et al. (2022) ... Before considering assessment of microplastics for estuarine or marine beneficial use for the 303(d) list, the development of an applicable, relevant, and environmentally representative threshold is necessary” (p. 85)

STATE WATER RESOURCES CONTROL BOARD
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

FINAL STAFF REPORT

2024 CALIFORNIA INTEGRATED REPORT:
SURFACE WATER QUALITY ASSESSMENTS
TO COMPLY WITH
CLEAN WATER ACT SECTIONS 303(d) AND 305(b)



March 13, 2024

State of California
Gavin Newsom, Governor

California Environmental Protection Agency
Yana Garcia, Secretary

State Water Resources Control Board
E. Joaquin Esquivel, Chair
Dorene D'Adamo, Vice-Chair
Nichole Morgan, Member
Sean Maguire, Member
Laurel Firestone, Member

Eric Oppenheimer, Executive Director
Jonathan Bishop, Chief Deputy Director

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY



https://www.waterboards.ca.gov/water_issues/programs/tmdl/2023_2024state_ir_reports/2024-integrated-report-final-staff-report.pdf#page=86

4) Challenges of Sampling for Microplastics in Wastewater Media



- Collection Methods: ASTM Method, autosamplers, inline filtration; ASTM method is very challenging and resource intensive
- Processing/Preparation Methods: ASTM Method, SCCWRP modification, and other established means for preparing wastewater samples
- Analytical Methods: Optical microscopy, SWRCB's FTIR/RAMEN SOP, Py-GCMS; equipment for SWRCB SOP is expensive and method is time consuming

4) Challenges of Sampling for Microplastics in Wastewater Media



ASTM D8332-20

24-hour method
for collecting
samples in
wastewater



Available online [here](#)

4) Challenges of Sampling for Microplastics in Wastewater Media



4) Challenges of Sampling for Microplastics in Wastewater Media

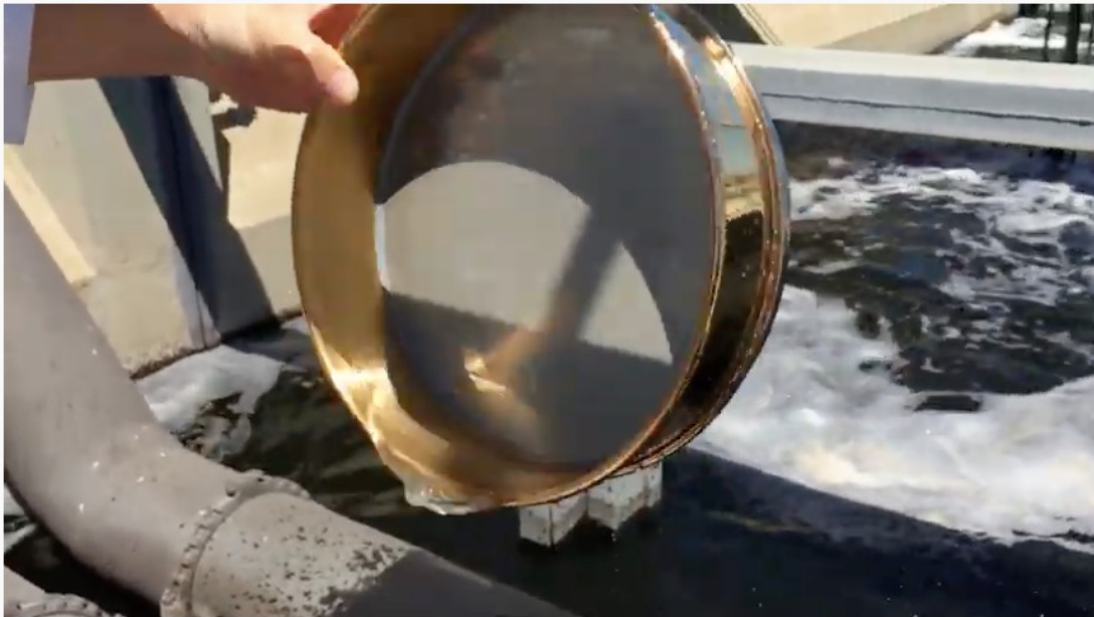


Standardized method is challenging: Requires 2 to 3 staff to monitor a sampling station over 24-hours.

Central San produced a training video for other pilot sites:

<https://vimeo.com/user89502764/review/596817804/892cca6866>

4) Challenges of Sampling for Microplastics in Wastewater Media



2021 08 09 MOV rinsing the 20 um sieve



2021 08 09 MOV rinsing the 20 um sieve

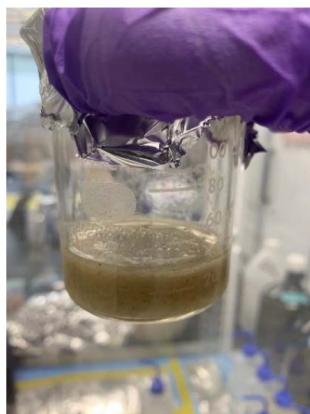
- Rinsing the sieves with microplastics-free water
- Importance of field blanks

4) Challenges of Sampling for Microplastics in Wastewater Media



Efficacy of ASTM D8333-20 method

Central San Primary Effluent 125
um size fraction



Before

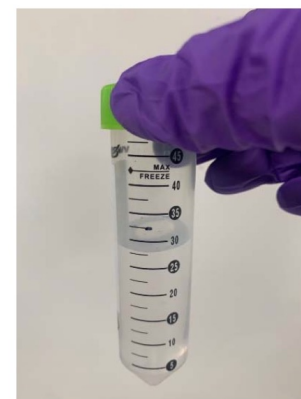


After



Lab procedural blank
(MAG water)

Before



After



- Unable to remove interferences completely
- May even generate residues from Schweizer's reagent and enzymatic digestion



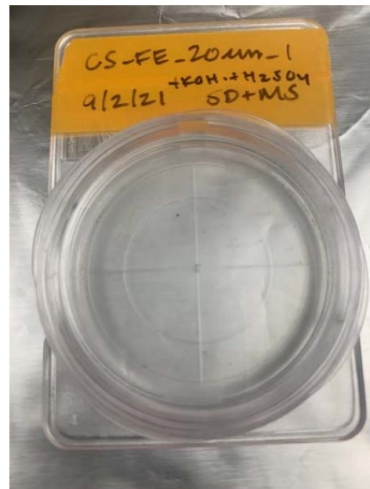
4) Challenges of Sampling for Microplastics in Wastewater Media



Central San Secondary Effluent
20um size fraction
Final filters

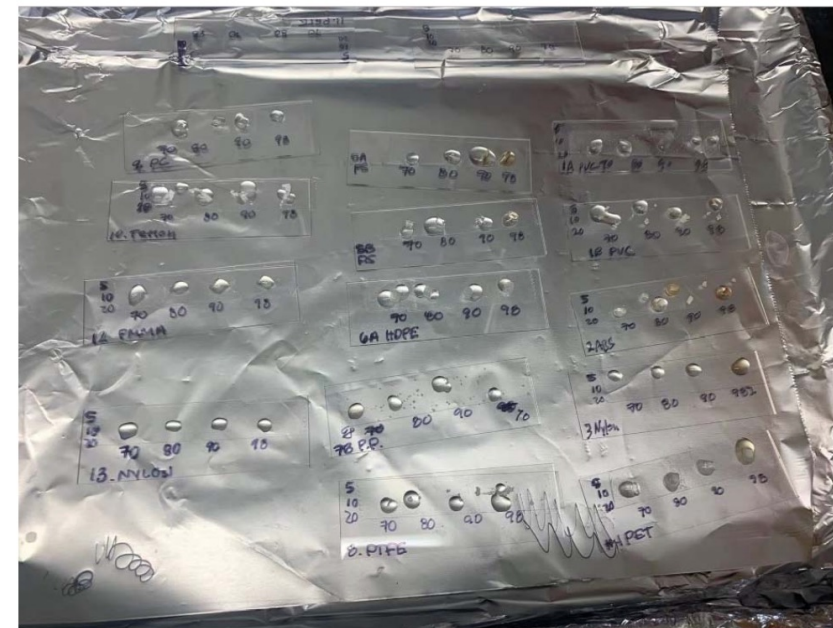


ASTM method



AAD method

Effect of H₂SO₄ concentration and contact time

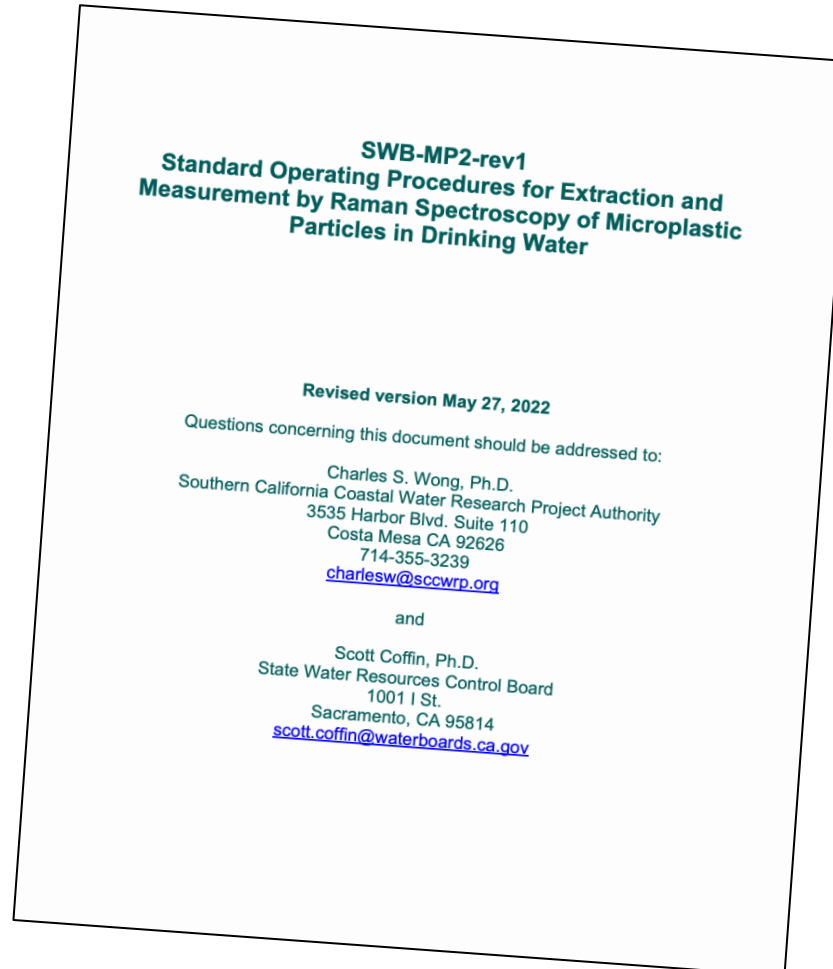


4) Challenges of Sampling for Microplastics in Wastewater Media



California SOPs for
FTIR and Raman
Spectroscopy

Developed by
SCCWRP from a
microplastics
methods evaluation
study.



Collection, Processing, and Analytical Methodologies



Methods Requested for Accreditation

	Optical Microscopy	FTIR	Raman
Accuracy (Overall)	44 ± 27%	93%	83%
Measurement time/sample	26 ±54 hours	10 ±9 hours	15 ±16 hours
Instrument cost	\$26,500 (\$500 - \$110,000)	\$95,000 (\$550 - \$300,000)	\$165,000 (\$10,000 - \$337,000)
Consumables cost	\$1,100 (\$84-\$5000)	\$900 (\$10 - \$5000)	\$2,500 (\$10-\$12000)
Chemical identification	No	Yes	Yes
Lower size limit (approximate)	> 20 μm	> 10 μm	> 2 μm



From Scott Coffin Presentation on 9/7/21

Questions or to be Added to the CASA Regulatory Listserv



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