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*Submitted via email and by upload to Water Board FTP site on October 15, 2019*

October 15, 2019

Mr. Michael Montgomery  
Executive Officer  
San Francisco Bay Region  
Regional Water Quality Control Board  
1515 Clay Street, Suite 1400  
Oakland, CA 94612

**Subject: SCVURPPP Pollutant of Concern Monitoring Report - Water Year 2019  
Accomplishments & Water Year 2020 Planned Allocation of Effort**

Dear Mr. Montgomery:

On behalf of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP), I am pleased to submit SCVURPPP's *Pollutant of Concern (POC) Monitoring Report – Water Year (WY) 2019<sup>1</sup> Accomplishments and WY 2020<sup>2</sup> Planned Allocation of Effort*. The POC Monitoring Report is submitted on behalf of all SCVURPPP Permittees in compliance with Provision C.8.h.iv of NPDES Permit # CAS612008 (Order No. R2-2015-0049). The report describes the allocation of sampling effort for POC monitoring in WY 2020 and what was accomplished for POC monitoring in WY 2019. The POC monitoring locations for WY 2019 are included in the report, along with the number and types of samples, purpose of the sampling, and analytes measured in WY 2019 and anticipated monitoring in WY 2020. Exact POC monitoring locations for WY 2020 are under development based on SCVURPPP's on-going efforts to identify likely PCB and mercury source properties and high interest Watershed Management Areas (WMAs) for these pollutants.

*"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."*

Very truly yours,

Adam W. Olivieri, Dr. P.H., P.E.  
Program Manager

*Submitted on behalf of the Santa Clara Valley Urban Runoff Pollution Prevention Program (per Management Committee direction)*

CC: SCVURPPP Management Committee Members  
Keith Lichten, Janet O'Hara, and Richard Looker, SF Bay Water Board  
Chris Sommers, SCVURPPP Project Manager

Attachments: SCVURPPP POC Monitoring Report - WY 2019 Accomplishments & WY 2020 Planned Allocation of Effort

<sup>1</sup> Water Year 2019 is from October 1, 2018 through September 30, 2019

<sup>2</sup> Water Year 2020 is from October 1, 2019 through September 30, 2020



# Pollutants of Concern Monitoring Report

*Water Year 2019 Accomplishments & Water Year 2020 Planned  
Allocation of Effort*

*Submitted in compliance with Provision C.8.h.iv of NPDES Permit # CAS612008 (Order No. R2-2015-0049)*

**October 15, 2019**

*This report is submitted by the agencies participating in the*



City of Campbell

City of Cupertino

City of Los Altos

Town of Los Altos Hills

Town of Los Gatos

City of Milpitas

City of Monte Sereno

City of Mountain View

City of Palo Alto

City of San Jose

City of Santa Clara

City of Saratoga

City of Sunnyvale

County of Santa Clara

Santa Clara Valley Water District

*Prepared for:*

**Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP)**

*Prepared by:*

**EOA, Inc.**

1410 Jackson St., Oakland, CA 94612



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Appendix A. SCVURPPP Sediment Monitoring Stations in WY 2019

## LIST OF ACRONYMS

AFR	Alternative Flame Retardant
BASMAA	Bay Area Stormwater Management Agencies Association
BMP	Best Management Practice
CEC	Contaminants of Emerging Concern
CEDEN	California Environmental Data Exchange Network
ECWG	Emerging Contaminants Work Group of the RMP
HDS	Hydrodynamic Separator
IMR	Integrated Monitoring Report
MRP	Municipal Regional Permit
NNE	Nutrient Numeric Endpoints
NPDES	National Pollution Discharge Elimination System
PBDEs	Polybrominated Diphenyl Ethers
PCBs	Polychlorinated Biphenyls
PFAS	Perfluoroalkyl Sulfonates
PFOS	Perfluorooctane Sulfonates
POC	Pollutant of Concern
RAA	Reasonable Assurance Analysis
RMP	Regional Monitoring Program
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SPoT	Statewide Stream Pollutant Trend Monitoring
SSC	Suspended Sediment Concentration
SSID	Stressor/Source Identification
STLS	Small Tributary Loading Strategy
TOC	Total Organic Carbon
UCMR	Urban Creeks Monitoring Report
WMA	Watershed Management Area
WY	Water Year

## 1.0 INTRODUCTION

This Pollutants of Concern (POC) Monitoring Report was prepared by the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP or Program) on behalf of its 15 member agencies (13 cities/towns, the County of Santa Clara, and the Santa Clara Valley Water District) subject to the National Pollutant Discharge Elimination System (NPDES) stormwater permit for Bay Area municipalities, referred to as the Municipal Regional Permit (MRP). The MRP was issued by the San Francisco Regional Water Quality Control Board (Regional Water Board) on November 19, 2015 as Order R2-2015-0049. This report fulfills the requirements of Provision C.8.h.iv of the MRP for reporting:

- The allocation of sampling effort for POC monitoring planned for the forthcoming year (i.e., Water Year 2020<sup>1</sup>), and
- What was accomplished for POC monitoring during the preceding water year (i.e., Water Year 2019).

In compliance with Provision C.8.h.iv, this report includes monitoring locations, number and types of samples collected, purpose of sampling (Management Questions addressed), and analytes measured. Data and interpretations will be provided with the Integrated Monitoring Report (IMR) which will be submitted to the Regional Water Board by March 31, 2020, in lieu of an annual Urban Creeks Monitoring Report (UCMR). The IMR will include a comprehensive analysis of all data collected since the previous IMR (i.e., data from Water Years 2014 through 2019). Data collected in receiving waters (e.g., creeks) will be submitted to the San Francisco Bay Area Regional Data Center by March 31, 2020 for upload to the California Environmental Data Exchange Network (CEDEN). Similar POC Monitoring Reports were submitted on October 15, 2016, 2017, and 2018.

### 1.1 POC Monitoring Requirements

Provision C.8.f of the MRP requires monitoring of several POCs including polychlorinated biphenyls (PCBs), mercury, copper, emerging contaminants<sup>2</sup>, and nutrients. Provision C.8.f specifies yearly (i.e., Water Year) and total (i.e., permit term) minimum numbers of samples for each POC. In addition, POC monitoring must address the five priority management information needs (i.e., Management Questions) identified in C.8.f:

1. **Source Identification** – identifying which sources or watershed source areas provide the greatest opportunities for reductions of POCs in urban stormwater runoff;
2. **Contributions to Bay Impairment** – identifying which watershed source areas contribute most to the impairment of San Francisco Bay beneficial uses (due to source intensity and sensitivity of discharge location);
3. **Management Action Effectiveness** – providing support for planning future management actions or evaluating the effectiveness or impacts of existing management actions;
4. **Loads and Status** – providing information on POC loads, concentrations or presence in local tributaries or urban stormwater discharges; and
5. **Trends** – providing information on trends in POC loading to the Bay and POC concentrations

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<sup>1</sup> POC monitoring is conducted on a Water Year (WY) basis, with each WY beginning on October 1 and concluding on September 30 of the named year. For example, WY 2019 began October 1, 2018 and concluded on September 30, 2019.

<sup>2</sup> Emerging contaminant monitoring requirements will be met through participation in Regional Monitoring Program for Water Quality in the San Francisco Estuary (RMP) special studies. The special studies will account for relevant Contaminants of Emerging Concern (CECs) in stormwater and will address at least perfluorooctane sulfonates (PFOS), perfluoroalkyl sulfonates (PFAS), and alternative flame retardants being used to replace PBDEs. Bay Area Stormwater Management Agencies Association (BASMAA) representatives are working with the RMP to develop and implement the work plans.

in urban stormwater discharges or local tributaries over time.

The MRP specifies the minimum number of samples that must be collected and analyzed for each POC. For example, over the first five years of the permit, a minimum total of 80 PCBs samples must be collected and analyzed. On average 16 PCBs samples should be collected per year to meet the total requirement of 80 samples; however, the Permit requires a minimum of at least 8 PCB samples per year which gives flexibility to collect more samples some years and less other years. The MRP also specifies the minimum number of samples for each POC that must address each Management Question. For example, by the end of Year Four<sup>3</sup> of the permit term, each of the five Management Questions listed above must be addressed with at least 8 PCB samples. It is possible that a single sample can address more than one Management Question. POC Monitoring requirements are summarized in Table 1.

Other MRP provisions require studies or have information needs that could be addressed through Provision C.8.f (POC Monitoring) and for which related samples will count towards POC monitoring requirements. These other Permit provisions and their associated timelines are listed below.

- Provisions C.11.a and C.12.a require that Permittees develop and maintain a list of management areas (referred to in this report as Watershed Management Areas, or WMAs) in which new mercury and PCBs control measures will be implemented during the permit term, as well as the monitoring data and other information used to select the WMAs. Progress toward developing the list was reported on April 1, 2016 and more complete lists with identified control measures are provided with each Annual Report, beginning with the 2016 Annual Report that was submitted on September 30, 2016. Provision C.8.f (POC Monitoring) is intended to support C.11/12 requirements by requiring monitoring directed toward source identification (i.e., identifying which WMAs provide the greatest opportunities for implementing controls to reduce loads of POCs in urban stormwater runoff and source areas within the WMAs).
- Provision C.12.e requires that Permittees collect at least 20 composite samples (region-wide) of the caulks and sealants used in storm drains or roadway infrastructure in public rights-of-way. Results of the investigation must be reported with the 2018 Annual Report, due by September 30, 2018. To achieve compliance with Provision C.12.e, MRP Permittees worked together to conduct this sampling via the Bay Area Stormwater Management Agencies Association (BASMAA) in WY 2018.
- Provisions C.11.c and C.12.c require that Permittees submit a Reasonable Assurance Analysis to demonstrate quantitatively that mercury reductions of at least 10 kg/year and PCBs reductions of at least 3 kg/year will be realized by 2040 through implementation of green infrastructure projects. Although these provisions will be met through modeling, POC monitoring focused on management action effectiveness may help inform development and calibration of the models. To learn more about the effectiveness of selected stormwater treatment controls, MRP Permittees collectively conducted monitoring studies through BASMAA in WY 2018.

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<sup>3</sup>Note that the minimum sampling requirements addressing information needs must be completed by the end of year four of the permit; whereas, the minimum number of total samples does not need to be met until the end of year five of the permit.

**Table 1. Pollutant of Concern monitoring parameters, efforts and types required by the MRP.**

Pollutant of Concern	Media	Total Samples <sup>d</sup>	Yearly Minimum	Minimum # of Samples that Must be Collected for Each Information Need by the End of Year Four				
				Source Identification	Contributions to Bay Impairment	Management Action Effectiveness	Loads and Status	Trends
PCBs	Water or sediment	80	8	8	8	8	8	8
Total Mercury	Water or sediment	80	8	8	8	8	8	8
Total & Dissolved Copper	Water	20	2	--	--	--	4	4
Nutrients <sup>a</sup>	Water	20	2	--	--	--	20	--
Emerging Contaminants <sup>b</sup>	--	--	--	--	--	--	--	--
Ancillary Parameters <sup>c</sup>	--	--	--	--	--	--	--	--

a. Ammonium<sup>4</sup>, nitrate, nitrite, total Kjeldahl nitrogen, orthophosphate, total phosphorus (analyzed concurrently in each nutrient sample).

b. Must include perfluorooctane sulfonates (PFOS, in sediment), perfluoroalkyl sulfonates (PFAS, in sediment), alternative flame retardants. The Permittee shall conduct or cause to be conducted a special study that addresses relevant management information needs for emerging contaminants. The special study must account for relevant Contaminants of Emerging Concern (CECs) in stormwater and would address at least PFOS, PFAS, and alternative flame retardants being used to replace PBDEs.

c. Total Organic Carbon (TOC) should be collected concurrently with PCBs data when normalization to TOC is deemed appropriate. Suspended sediment concentration (SSC) should be collected in water samples used to assess loads, loading trends, or Best Management Practice (BMP) effectiveness. Hardness data are used in conjunction with copper concentrations collected in fresh water.

d. Total samples that must be collected over the five-year Permit term.

## 1.2 Third-Party Data

SCVURPPP strives to work collaboratively with our water quality monitoring partners to find mutually beneficial monitoring approaches. Provision C.8.a.iii of the MRP allows Permittees to use data collected by third-party organizations to fulfill monitoring requirements, provided the data are demonstrated to meet the required data quality objectives. For example, samples collected in Santa Clara County through BASMAA, the Regional Monitoring Program for Water Quality in the San Francisco Estuary (RMP) and the State’s Stream Pollution Trends (SPoT) Monitoring Program may supplement the Program’s efforts towards achieving Provision C.8.f monitoring requirements. Third party monitoring conducted or planned by the RMP and SPoT are briefly summarized in this report.

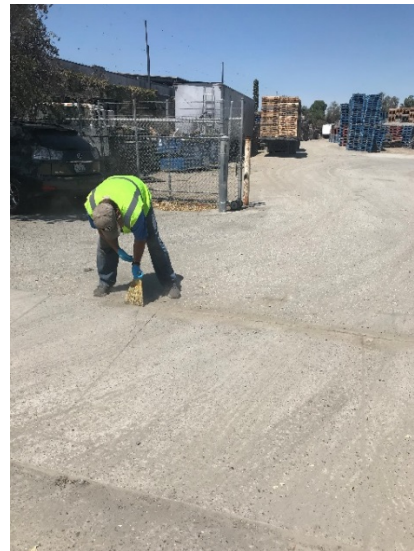
<sup>4</sup> There are several challenges to collecting samples for “ammonium” analysis. Therefore, samples will be analyzed for total ammonia which is the sum of un-ionized ammonia (NH<sub>3</sub>) and ionized ammonia (ammonium, NH<sub>4</sub><sup>+</sup>). Ammonium concentrations will be calculated by subtracting the calculated concentration of un-ionized ammonia from the measured concentration of total ammonia. Un-ionized ammonia concentrations will be calculated using a formula provided by the American Fisheries Society that includes field pH, field temperature, and specific conductance. This approach was approved by Regional Water Board staff in an email dated June 21, 2016.

## 2.0 POC MONITORING ACCOMPLISHMENTS (WY 2019) AND GOALS (WY 2020)

In compliance with Provision C.8.f of the MRP, the Program conducted POC monitoring in WY 2019 for PCBs, mercury, copper, and nutrients. The MRP-required yearly minimum number of samples was met or exceeded for all POCs in WY 2019. The total number of samples collected for each POC in WY 2019, the agency conducting the monitoring, and the Management Questions addressed are listed in Table 2 (PCBs), Table 3 (mercury), Table 4 (copper), and Table 5 (nutrients). These tables also include this information for WY 2016 through WY 2018 and show cumulative progress towards the MRP minimum sample requirements. Tables 2 through 5 show that the MRP-required minimum number of samples addressing each Management Question by the end of year four of the Permit was met or exceeded for all POCs. Specific monitoring stations are listed in Table 6 and illustrated in Figure 2. The sections below describe details of the monitoring accomplished in WY 2019 and the planned allocation of effort for WY 2020. A summary of the planned allocation of effort for WY 2020 is presented in Table 7.



Sediment sample collection with metal spoon



Sediment sample collection with dust broom



Sediment sample collection with pole in vault



Sediment sample collection with pole in maintenance hole

**Figure 1. Sediment sampling methods employed by SCVURPPP for PCBs and mercury samples.**

**Table 2. SCVURPPP and Third-Party Monitoring Accomplishments for PCBs, WY 2016 – WY 2019.**

Pollutant of Concern/ Organization	Number of PCBs Samples	Management Question Addressed <sup>a</sup>					Sample Type and Comments
		1. Source Identification	2. Contributions to Bay Impairment	3. Management Action Effectiveness	4. Loads and Status	5. Trends	
<b>WY 2019</b>							
SCVURPPP	15	15	15	--	15	15	Stormwater runoff samples to characterize WMAs
SCVURPPP	56	56	--	--	--	--	Sediment samples to identify source properties
RMP STLS	2	2	2	--	2	2	Stormwater runoff samples to characterize WMAs
SPoT	2	--	--	--	--	2	Sediment sample to assess long-term trends (PCBs only, no mercury)
<b>WY 2018</b>							
SCVURPPP	8	8	8	--	8	2	Stormwater runoff samples to characterize WMAs
SCVURPPP/BASMAA	5	5	--	--	--	--	Regional public infrastructure caulk/sealant samples (1/4 of project total)
SCVURPPP/BASMAA	8	--	--	8	--	--	Regional HDS unit & biochar effectiveness study (1/4 of project total)
RMP STLS	2	2	2	--	2	2	Stormwater runoff samples to characterize WMAs.
SPoT	--	--	--	--	--	--	Sediment sample to assess long-term trends (mercury only, no PCBs)
<b>WY 2017</b>							
SCVURPPP	16	16	16	--	16	--	Stormwater runoff samples to characterize WMAs
SCVURPPP	75	75	--	--	--	--	Sediment samples to identify source areas
RMP STLS	2	2	2	--	2	--	Stormwater runoff samples to characterize WMAs
RMP STLS	1	--	1	--	1	1	High flow sample collected in Guadalupe River
SPoT	2	--	--	--	--	2	Sediment sample to assess long-term trends
<b>WY 2016</b>							
SCVURPPP	9	9	9	--	9	--	Stormwater runoff samples to characterize WMAs
RMP STLS	6	6	6	--	6	--	Stormwater runoff samples to characterize WMAs
<b>Total / MRP Minimum<sup>b</sup></b>	<b>209 / 80</b>	<b>196 / 8</b>	<b>61 / 8</b>	<b>8 / 8</b>	<b>61 / 8</b>	<b>26 / 8</b>	

<sup>a</sup> Individual samples can address more than one Management Question simultaneously.

<sup>b</sup> The MRP overall minimum number of samples must be met by the end of the five-year permit term. The MRP minimum number of samples for each Management Question must be met by the end of year four of the permit (i.e., 2019).

**Table 3. SCVURPPP and Third-Party Monitoring Accomplishments for Mercury, WY 2016 – WY 2019.**

Pollutant of Concern/ Organization	Number of PCBs Samples	Management Question Addressed <sup>a</sup>					Sample Type and Comments
		1. Source Identification	2. Contributions to Bay Impairment	3. Management Action Effectiveness	4. Loads and Status	5. Trends	
<b>WY 2019</b>							
SCVURPPP	15	15	15	--	15	15	Stormwater runoff samples to characterize WMAs
SCVURPPP	56	56	--	--	--	--	Upland sediment samples to identify source properties
RMP STLS	2	2	2	--	2	2	Stormwater runoff samples to characterize WMAs
SPoT	--	--	--	--	--	--	Sediment sample to assess long-term trends (PCBs only, no mercury)
<b>WY 2018</b>							
SCVURPPP	8	8	8	--	8	2	Stormwater runoff samples to characterize WMAs
SCVURPPP/BASMAA	5	5	--	--	--	--	Regional public infrastructure caulk/sealant samples (1/4 of project total)
SCVURPPP/BASMAA	8	--	--	8	--	--	Regional HDS unit & biochar effectiveness study (1/4 of project total)
RMP STLS	2	2	2	--	2	2	Stormwater runoff samples to characterize WMAs.
SPoT	2	--	--	--	--	2	Sediment sample to assess long-term trends (mercury only, no PCBs)
<b>WY 2017</b>							
SCVURPPP	16	16	16	--	16	--	Stormwater runoff samples to characterize WMAs
SCVURPPP	75	75	--	--	--	--	Upland sediment samples to identify source properties
RMP STLS	2	2	2	--	2	--	Stormwater runoff samples to characterize WMAs
RMP STLS	14	--	14	14	14	41	High flow sample collected in Guadalupe River
SPoT	1	--	--	--	--	1	Sediment sample to assess long-term trends
<b>WY 2016</b>							
SCVURPPP	9	9	9	--	9	--	Stormwater runoff samples to characterize WMAs
RMP STLS	6	6	6	--	6	--	Stormwater runoff samples to characterize WMAs
<b>Total / MRP Minimum<sup>b</sup></b>	<b>221 / 80</b>	<b>196 / 8</b>	<b>74 / 8</b>	<b>22 / 8</b>	<b>74 / 8</b>	<b>65 / 8</b>	

<sup>a</sup> Individual samples can address more than one Management Question simultaneously.

<sup>b</sup> The MRP overall minimum number of samples must be met by the end of the five-year permit term. The MRP minimum number of samples for each Management Question must be met by the end of year four of the permit (i.e., 2019).

**Table 4. SCVURPPP and Third-Party Monitoring Accomplishments for Copper, WY 2016 – WY 2019.**

Pollutant of Concern/ Organization	Number of Samples	Management Question Addressed <sup>a</sup>					Sample Type and Comments
		1. Source Identification	2. Contributions to Bay Impairment	3. Management Action Effectiveness	4. Loads and Status	5. Trends	
<b>WY 2019</b>							
SCVURPPP	2	--	--	--	2	--	Copper analyzed on a subset of PCBs/Hg stormwater runoff samples
<b>WY 2018</b>							
SCVURPPP	6	--	--	--	6	6	Creek water samples collected during storm event and spring base flows
SPoT	2	--	--	--	--	2	Sediment sample to assess trends at long-term monitoring station
<b>WY 2017</b>							
SCVURPPP	2	--	--	--	2	--	Copper analyzed on a subset of PCBs/Hg stormwater runoff samples
SCVURPPP	3	--	--	--	3	3	Creek water samples collected during storm event
SPoT	1	--	--	--	--	1	Sediment sample to assess trends at long-term monitoring station
<b>WY 2016</b>							
SCVURPPP	4	--	--	--	4	--	Copper analyzed on a subset of PCBs/Hg stormwater runoff samples
<b>Total / MRP Minimum<sup>b</sup></b>	<b>20 / 20</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>17 / 4</b>	<b>12 / 4</b>	

NA = Not Applicable. For this pollutant, the MRP does not require sampling to address the management question.

<sup>a</sup> Individual samples can address more than one Management Question simultaneously.

<sup>b</sup> The MRP overall minimum number of samples must be met by the end of the five-year permit term. The MRP minimum number of samples for each Management Question must be met by the end of year four of the permit.

**Table 5. SCVURPPP and Third-Party Monitoring Accomplishments for Nutrients, WY 2016 – WY 2019.**

Pollutant of Concern/ Organization	Number of Samples	Management Question Addressed <sup>a</sup>					Sample Type and Comments
		1. Source Identification	2. Contributions to Bay Impairment	3. Management Action Effectiveness	4. Loads and Status	5. Trends	
<b>WY 2019</b>							
SCVURPPP	13	13	--	--	13	--	Water samples collected as part of Stressor Source Identification study
<b>WY 2018</b>							
SCVURPPP	6	--	--	--	6	--	Creek water samples collected during storm event and spring base flows
<b>WY 2017</b>							
SCVURPPP	4	--	--	--	4	--	Creek water samples collected during storm event and spring base flows
<b>WY 2016</b>							
SCVURPPP	2	--	--	--	2	--	Water samples collected from Stressor Source Identification study station
<b>Total / MRP Minimum<sup>b</sup></b>	<b>25 / 20</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>25 / 20</b>	<b>NA</b>	

NA = Not Applicable. For this pollutant, the MRP does not require sampling to address the management question.

<sup>a</sup> Individual samples can address more than one Management Question simultaneously.

<sup>b</sup> The MRP overall minimum number of samples must be met by the end of the five-year permit term. The MRP minimum number of samples for each Management Question must be met by the end of year four of the permit.

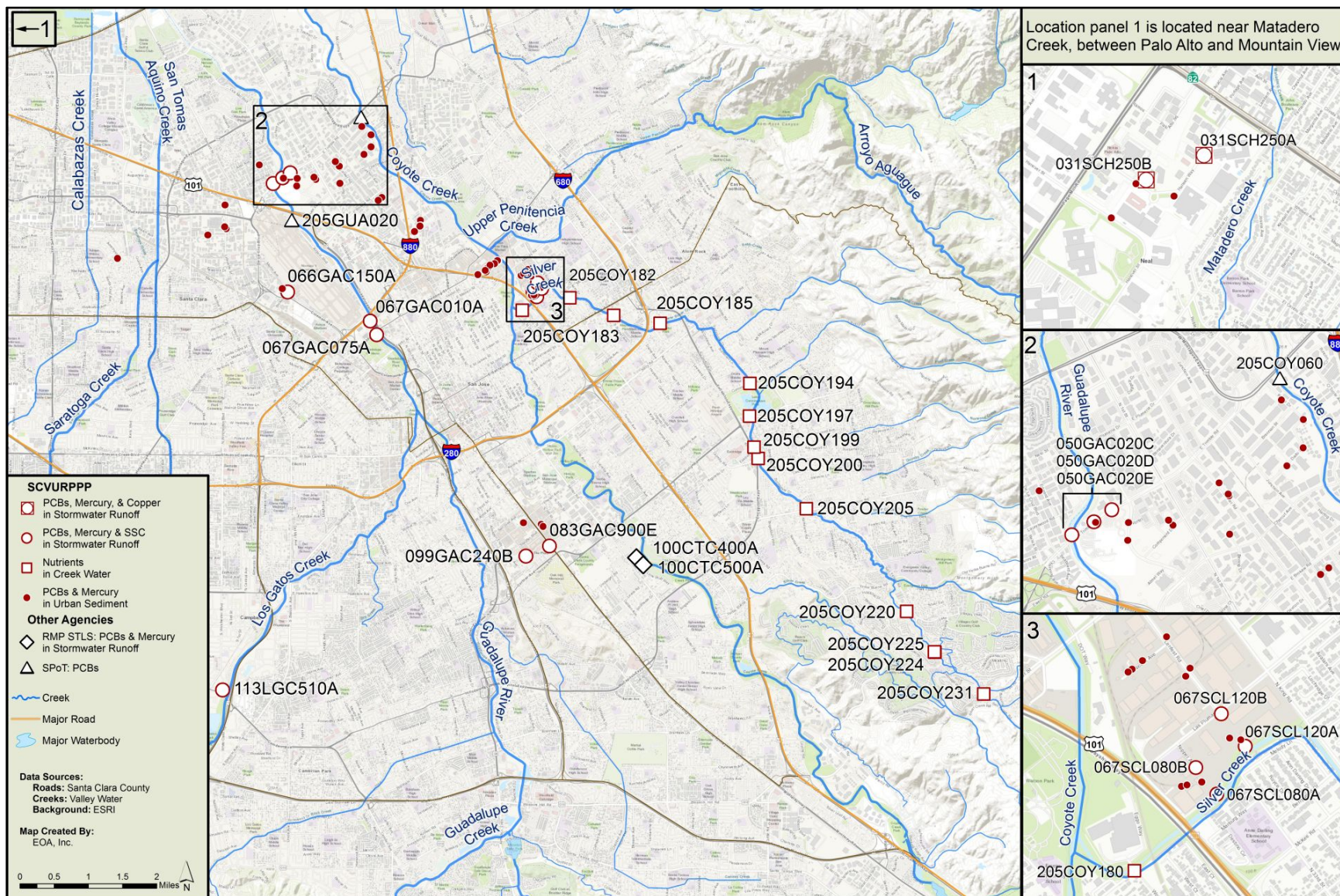


Figure 2. SCVURPPP and Third-Party POC Monitoring Stations in WY 2019.

**Table 6. SCVURPPP and Third-Party POC Monitoring Stations in WY 2019.**

Agency	Station Code	Sample Date	Latitude	Longitude	Matrix	PCBs	Mercury	Suspended Sediment Concentration	Total Copper	Dissolved Copper	Hardness as CaCO3	Nutrients <sup>a</sup>
<b>SCVURPPP</b>												
SCVURPPP	031SCH250A	1/6/2019	37.41891	-122.13962	water	x	x	x	x	x	x	
SCVURPPP	031SCH250B	1/6/2019	37.41778	-122.14278	water	x	x	x	x	x	x	
SCVURPPP	067GAC010A	1/6/2019	37.35227	-121.91156	water	x	x	x				
SCVURPPP	067GAC075A	1/6/2019	37.34939	-121.90981	water	x	x	x				
SCVURPPP	067SCL080A	1/16/2019	37.35791	-121.86744	water	x	x	x				
SCVURPPP	067SCL080B	1/16/2019	37.35888	-121.86843	water	x	x	x				
SCVURPPP	067SCL120A	1/16/2019	37.35969	-121.86616	water	x	x	x				
SCVURPPP	067SCL120B	1/16/2019	37.36088	-121.86729	water	x	x	x				
SCVURPPP	050GAC020E	2/1/2019	37.38108	-121.93791	water	x	x	x				
SCVURPPP	083GAC900E	2/2/2019	37.30516	-121.86306	water	x	x	x				
SCVURPPP	099GAC240B	2/2/2019	37.30298	-121.86932	water	x	x	x				
SCVURPPP	066GAC150A	2/13/2019	37.35816	-121.93362	water	x	x	x				
SCVURPPP	050GAC020C	2/27/2019	37.38229	-121.93544	water	x	x	x				
SCVURPPP	050GAC020D	2/27/2019	37.38339	-121.93345	water	x	x	x				
SCVURPPP	113LGC510A	2/27/2019	37.27362	-121.94925	water	x	x	x				
SCVURPPP	(56 samples. See Appendix A for details.)				sediment	x	x					
SCVURPPP	205COY231	8/8/2019	37.27513	-121.74731	water							x
SCVURPPP	205COY225	8/8/2019	37.28385	-121.76039	water							x
SCVURPPP	205COY224	8/8/2019	37.28391	-121.76051	water							x
SCVURPPP	205COY220	8/8/2019	37.29240	-121.76803	water							x
SCVURPPP	205COY205	8/8/2019	37.31386	-121.79504	water							x
SCVURPPP	205COY200	8/8/2019	37.32436	-121.80798	water							x
SCVURPPP	205COY199	8/8/2019	37.32677	-121.80912	water							x
SCVURPPP	205COY197	8/8/2019	37.3333	-121.81044	water							x
SCVURPPP	205COY194	8/8/2019	37.34023	-121.81046	water							x
SCVURPPP	205COY185	8/8/2019	37.35273	-121.83455	water							x
SCVURPPP	205COY183	8/8/2019	37.35425	-121.84690	water							x
SCVURPPP	205COY182	8/8/2019	37.35784	-121.85861	water							x
SCVURPPP	205COY180	8/8/2019	37.35505	-121.87121	water							x
<b>Third Party Organizations</b>												
RMP STLS	100CTC400A	1/16/2019	37.30300	-121.83995	water	x	x	x				
RMP STLS	100CTC500A	1/16/2019	37.30149	-121.83815	water	x	x	x				
SPoT	205GUA020	7/2/2019	37.3734	-121.9328	sediment	x						
SPoT	205COY060	7/2/2019	37.3954	-121.9148	sediment	x						

<sup>a</sup> Ammonia (for ammonium), nitrate, nitrite, total Kjeldahl nitrogen, orthophosphate, and total phosphorus are analyzed concurrently in each nutrient sample.

## 2.1 PCBs and Mercury

During WY 2019 the Program collected 15 stormwater runoff samples and analyzed each for PCBs and mercury. Two additional stormwater runoff samples were collected in Santa Clara County through the RMPs Small Tributary Loading Strategy (STLS) and analyzed for mercury and PCBs. These combined SCVURPPP and STLS samples address Management Questions #1 (Source Identification), #2 (Contributions to Bay Impairment) and provide information for assessing trends (i.e., Management Question #5). Data may also be used by the RMP STLS to improve calibration of models used to estimate the overall POC loads from small tributaries to San Francisco Bay (i.e., Management Question #4 – Loads and Status). SCVURPPP also collected 56 upland sediment samples to address Management Question #1 (Source Identification). Two additional streambed sediment samples collected in Santa Clara County by the SPoT program were analyzed for PCBs to address Management Question #5 (Trends).

### 2.1.1 SCVURPPP Accomplishments and Goals

#### WY 2019 Accomplishments

As in previous years, the primary goal of PCBs and mercury monitoring conducted by SCVURPPP in WY 2019 was to inform identification of WMAs and source properties where control measures could be implemented to comply with MRP requirements for load reductions of PCBs. There were two general approaches to PCBs monitoring implemented in WY 2019:

- The Program collected 15 composite water samples from the stormwater conveyance system in WMAs containing high interest parcels. WMAs were identified and prioritized for sampling by evaluating several types of data, including: PCBs and mercury concentrations from prior sediment and water sampling efforts, land use data, municipal storm drain data showing pipelines and access points (e.g., manholes, outfalls, pump stations), catchment areas delineated from municipal storm drain data, and logistical/safety consideration. Station identification and sample collection was consistent with the *Water Year 2016 Pollutant of Concern Monitoring - Sampling and Analysis Plan* (SCVURPPP 2015). Composite samples consisting of six to eight aliquots collected during the rising limb and peak of the storm hydrograph (as determined through field observations) were analyzed for the “RMP 40” PCB congeners<sup>5</sup> (method EPA 1668), total mercury (method EPA 1631E), and SSC (method ASTM D3977).
- The Program collected 56 sediment samples as part of the source property investigation program. The goal of this program is to identify source properties that can be referred to the Regional Water Board for abatement. These samples were collected in and near parcels with characteristics associated with potential PCBs use and/or in WMAs with previously observed elevated PCBs concentrations. Sample collection methods were similar to the methods described and implemented previously (SCVURPPP 2016). Individual and composite sediment samples collected from ditches, manholes, storm drain inlets, vaults, driveways, sidewalks, and gravel pads were analyzed for the “RMP 40” PCB congeners (method EPA 8270 modified) total mercury (method EPA 7471A), and total solids<sup>6</sup> (method SM 2540G-11). Figure 1 shows photographs of some of the sediment sampling methods.

<sup>5</sup> The “RMP 40” congeners include: congeners PCB-8, PCB-18, PCB-28, PCB-31, PCB-33, PCB-44, PCB-49, PCB-52, PCB-56, PCB-60, PCB-66, PCB-70, PCB-74, PCB-87, PCB-95, PCB-97, PCB-99, PCB-101, PCB-105, PCB-110, PCB-118, PCB-128, PCB-132, PCB-138, PCB-141, PCB-149, PCB-151, PCB-153, PCB-156, PCB-158, PCB-170, PCB-174, PCB-177, PCB-180, PCB-183, PCB-187, PCB-194, PCB-195, PCB-201, PCB-203.

<sup>6</sup>Samples were analyzed for total solids so that dry weight calculations could be made.

## WY 2020 Goals

As stated above, the Program's WY 2019 PCBs and mercury monitoring focused on addressing Management Questions #1 (Source Identification) and #2 (Contributions to Bay Impairment), while contributing to the regional dataset being used to address Management Questions #3 (Loads and Status) and #5 (Trends). A similar focus is planned for WY 2020. The Program intends to collect five storm composite samples from WMAs, to assist with source detection and continue informing classification of WMAs. In some cases, WMAs previously targeted may be resampled to confirm unexpected results and develop a more robust dataset. An additional eight sediment samples will be collected within WMAs, primarily to identify specific source properties for referral to the Regional Water Board or another appropriate regulatory agency with investigation and cleanup authority. The specific coordinates for the WY 2020 samples are not yet known, and will be influenced by logistical field considerations such as tidal conditions during storm events (for storm samples), the presence of sampleable sediment within the storm drain system and right-of-way (for sediment samples), and ongoing review of the WY 2015 to WY 2019 dataset.

### 2.1.3 Third-Party Accomplishments and Goals

#### RMP STLS

The RMP's STLS Team typically conducts annual monitoring for POCs regionwide. SCVURPPP is an active participant in the STLS and works with other Bay Area municipal stormwater programs to identify opportunities to direct RMP funds and monitoring activities towards supplementing monitoring required by the MRP. POC monitoring activities conducted by the STLS in recent years have focused on wet weather characterization monitoring in catchments of interest (WY 2015 – present). In WY 2019, the STLS Team continued wet weather characterization sampling using a similar approach to the PCBs and mercury sampling that was implemented by the Program. The RMP's STLS collected one storm composite PCBs/mercury sample from each of two previously sampled catchments in Santa Clara County in WY 2019. Revisiting these stations will help confirm prior findings and provide information on variability during different years and types of storm events.

RMP STLS monitoring in WY 2020 will continue to focus on wet weather characterization. The number of stations in Santa Clara County targeted by the STLS Team will likely be limited to one or two stations previously sampled with unexpectedly low PCBs results. Additional stations may be monitored using unmanned "remote" samplers that capture suspended sediment from the water column throughout the duration of their deployment which is typically during one storm event. The STLS Team has been pilot testing these devices since WY 2015 and recently concluded that they generate data adequate for evaluating whether a WMA should be prioritized for source property investigations. In future years, RMP STLS monitoring is expected to shift towards Management Question #5 (Trends). The STLS Trends Strategy Team, initiated in WY 2015, is currently developing a regional monitoring program to assess trends in POC loading to San Francisco Bay from small tributaries. The STLS Trends Strategy will initially focus on PCBs and mercury, but will not be limited to those POCs. The preliminary design concept included additional monitoring at one or two of the region-wide loadings stations to gain a better understanding of the variability in PCBs concentrations/loadings in the existing dataset. However, uncertainties about the utility of developing a trends monitoring program targeting just one or two watersheds coupled with unknowns about how to extrapolate findings regionally has prompted the Trends Strategy Team to delay monitoring and focus instead on identifying practical modeling approaches. STLS Trends monitoring is not anticipated to commence before WY 2021.

#### SPoT Monitoring Program

The SPoT Monitoring Program conducts annual dry season monitoring (subject to funding constraints) of sediments collected from a statewide network of large rivers. The goal of the SPoT Program is to

investigate long-term trends in water quality (Management Question #5 – Trends). Sites are targeted in bottom-of-the-watershed locations with slow water flow and appropriate micromorphology to allow deposition and accumulation of sediments, including stations near the mouth of Coyote Creek and the Guadalupe River. In most years, sediments are analyzed for PCBs, mercury, metals (including copper), toxicity, pesticides, and organic pollutants (Phillips et al. 2014). In WY 2019, the Coyote and Guadalupe stations were only monitored for PCBs, PBDEs, PAHs, pesticides, organochlorines, and toxicity. The SPoT program will likely sample for mercury, copper, PBDEs, PAHs, pesticides, organochlorines, and toxicity in WY 2020 (K. Siegler personal communication, August 2019). The most recent technical report prepared by SPoT program staff was published in 2016 and describes seven-year trends from the initiation of the program in 2008 through 2014 (Phillips et al. 2016). An update to the report is anticipated in the near future.

## 2.2 Copper

In WY 2019, SCVURPPP collected two copper samples from storm drain outfalls concurrently with the PCBs and mercury storm composite samples in WMAs containing industrial land uses. The goal is to address Management Question #4 (Loads and Status) by characterizing copper concentrations in stormwater runoff from highly urban catchments.

In WY 2020, the Program is planning a similar approach and anticipates analyzing two of PCBs and mercury storm composites for copper. The process for identifying specific sampling stations will include land use analysis and logistical considerations related to stream access and field crew safety. In addition, in WY 2020, the SPoT Program is planning to include copper in its suite of analytical constituents for the dry-season sediment samples collected from the mouths of Coyote Creek and the Guadalupe River.

## 2.3 Nutrients

Nutrient monitoring addresses Management Question #4 (Loads and Status). Nutrients were included in the POC monitoring requirements to support Regional Water Board efforts to develop nutrient numeric endpoints (NNE) for the San Francisco Bay Estuary. The “Nutrient Management Strategy for San Francisco Bay” is part of a statewide initiative to address nutrient over-enrichment in State waters (Regional Water Board 2012). The suite of nutrients required in the MRP (i.e., ammonium, nitrate, nitrite, total Kjeldahl nitrogen, orthophosphate, and total phosphorus) closely reflects the list of analytes measured by the RMP and BASMAA partners at the six regional loading stations (including Santa Clara County stations on Guadalupe River and Sunnyvale East Channel) monitored in WY 2012 and WY 2013. The prior data were used by the Nutrient Strategy Technical Team to develop and calibrate nutrient loading models.

In WY 2019, POC monitoring for nutrients in Santa Clara County was conducted at 13 stations on Thompson Creek and Lower Silver Creek as part of a Stressor Source Identification (SSID) study investigating causes of low biological stream condition and sources of nutrients. WY 2020 POC monitoring for nutrients will also support the SSID study. The Work Plan for the Lower Silver-Thompson Creek Watershed SSID Project will be submitted with the IMR on March 31, 2020. Data from the SSID project will be interpreted in a study report anticipated for submittal with the WY 2020 UCMR.

## 2.4 Emerging Contaminants

Emerging contaminant monitoring is being addressed through the Program’s participation in the RMP. The RMP has investigated Contaminants of Emerging Concern (CECs) since 2001 and established the RMP Emerging Contaminants Work Group (ECWG) in 2006. The purpose of the ECWG is to identify CECs that might impact beneficial uses in the Bay and to develop cost-effective strategies to identify, monitor, and minimize impacts. The RMP published a CEC Strategy “living” document in 2013 and completed a full revision in 2017 (Sutton et al. 2013; Sutton and Sedlak 2015; Sutton et al. 2017) and made minor updates

in 2018 (Lin et al. 2018). The CEC Strategy document guides RMP special studies on CECs using a tiered risk and management action framework.

Provision C.8.f of the MRP identifies three emerging contaminants that must be addressed through POC monitoring: Perfluorooctane Sulfonate Substances (PFOS), Perfluoroalkyl and Polyfluoroalkyl Sulfonate Substances (PFAS), and Alternative Flame Retardants (AFRs). PFAS is a broad class of chemicals used in industrial applications and consumer goods primarily for their ability to repel oil and water. PFOS are a subgroup within the PFAS umbrella and are identified in the CEC Strategy as “moderate” concern due to Bay occurrence data suggesting a high probability of a low-level effect on Bay wildlife. Other PFAS and AFRs are identified as “possible” concern due to uncertainties in measured or predicted Bay concentrations or in toxicity thresholds. RMP staff recently published reports summarizing PFOS and PFAS monitoring results (Houtz et al. 2016; Sedlak et al. 2017; Sedlak et al. 2018).<sup>7</sup>

AFRs came into use following state bans and nationwide phase-outs of polybrominated diphenyl ether (PBDE) flame retardants in the early 2000’s. They include many categories of compounds, including organophosphate esters. In 2018 the RMP STLS and ECWG worked together to conduct a special study to inform ECWG’s planning activities related to AFRs. The special study compiled and reviewed available data and previously developed conceptual models for PBDE to support a stormwater-related AFR conceptual model being developed by the ECWG. Organophosphate esters were prioritized for further investigation due to their increasing use, persistent character, and ubiquitous detections at concentrations exceeding PBDE concentrations in the Bay. Limited stormwater data from two watersheds in Richmond and Sunnyvale suggest that urban runoff may be an important source of these compounds. Additional monitoring and modeling was recommended. Results of the AFR special study were published in a Technical Report in 2018 (Lin and Sutton 2018).

In 2018, the RMP’s ECWG also developed a special study proposal to analyze stormwater samples collected from urban watersheds for a large suite of CECs. The list of CECs to be analyzed is based on recent work conducted in Puget Sound streams and is intended to target urban runoff constituents rather than those found in wastewater (e.g., pharmaceuticals). The list includes PFOSs, PFASs, and AFRs. Pilot sampling is expected to begin in 2019 in close coordination with the STLS.

These RMP special studies satisfy the POC monitoring requirement for CECs within provision C.8.f.

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<sup>7</sup> The Emerging Contaminants Workgroup is also conducting monitoring on a number of other emerging contaminants that are not identified in the MRP. These include microplastics, ethoxylated surfactants, and fipronil.

**Table 7. Planned Allocation of SCVURPPP and Third-Party POC Monitoring Efforts in WY 2020.**

Pollutant of Concern/ Agency	Planned Number of Samples (WY 2020)	Yearly Minimum	Management Question Addressed <sup>a</sup>					Sample Type and Comments
			1. Source Identification	2. Contributions to Bay Impairment	3. Management Action Effectiveness	4. Loads and Status	5. Trends	
<b>PCBs &amp; Mercury</b>								
SCVURPPP	5	8	X	X	--	X	X	Stormwater runoff samples to classify WMAs
SCVURPPP	8		X	--	--	--	--	Urban street/storm drain/surface sediment samples in priority WMAs to identify source properties
RMP STLS	2		X	X	--	X	X	Stormwater runoff samples to classify WMAs
SPoT	2 (mercury only)		--	--	--	--	X	Long-term trends monitoring program (sediment samples from creek bed)
<b>Copper</b>								
SCVURPPP	2	2	--	--	--	X	--	Copper analyzed on a subset of PCBs/mercury stormwater runoff samples
SPoT	2		--	--	--	--	X	Long-term trends monitoring program (sediment samples from creek bed)
<b>Nutrients</b>								
SCVURPPP	2+	2	--	--	--	X	--	Lower Silver-Thompson Creek SSID Project

<sup>a</sup>. Individual samples can address more than one Management Question simultaneously.

### 3.0 REFERENCES

- Houtz, E.F., Sutton, R., Park, J-S., and Sedlak, M. 2016. Poly- and perfluoroalkyl substances in wastewater: Significance of unknown precursors, manufacturing shifts, and likely AFFF impacts. *Water Research* v. 95, pp. 142-149.
- Lin, D. Sutton, R., Shimabuku, I., Sedlak, M., Wu, J., and Holleman, R. 2018. Contaminants of Emerging Concern in San Francisco Bay: A Strategy for Future Investigations 2018 Update. SFEI Contribution No. 873. San Francisco Estuary Institute, Richmond, CA.
- Phillips, B.M., Anderson, B.S., Siegler, K., Voorhees, J., Tadesse, D., Weber, L., Breuer, R. 2014. Trends in Chemical Contamination, Toxicity and Land Use in California Watersheds: Stream Pollution Trends (SPoT) Monitoring Program. Third Report – Five-Year Trends 2008-2012. California State Water Resources Control Board, Sacramento, CA.
- Phillips, B.M., Anderson, B.S., Siegler, K., Voorhees, J., Tadesse, D., Weber, L., Breuer, R. 2016. Spatial and Temporal Trends in Chemical Contamination and Toxicity Relative to Land Use in California Watersheds: Stream Pollution Trends (SPoT) Monitoring Program. Fourth Report – Seven-Year Trends 2008-2014. California State Water Resources Control Board, Sacramento, CA.
- Regional Water Board. 2012. Nutrient Management Strategy for San Francisco Bay. November 2012.
- Regional Water Board. 2015. San Francisco Bay Region Municipal Regional Stormwater NPDES Permit. Order R2-2015-0049, NPDES Permit No. CAS612008. November 19, 2016. 152 pp plus Attachments A-G.
- SCVURPPP. 2015. Water Year 2016 Pollutant of Concern Monitoring. Sampling and Analysis Plan. November 16, 2015.
- SCVURPPP. 2016. PCBs and Mercury Source Area Identification, Water Year 2015 POC Monitoring Report.
- Sedlak, M.D., Benskin, J.P., Wong, A., Grace, R., and Greig, D.J. 2017. Per and polyfluoroalkyl substances (PFASs) in San Francisco Bay wildlife: Temporal trends, exposure pathways, and notable presence of precursor compounds. *Chemosphere* v. 185, pp. 1217-1226.
- Sedlak, M.D., Sutton, R., Wong, A., Lin, D. 2018. Per and polyfluoroalkyl substances (PFASs) in San Francisco Bay: Synthesis and Strategy. San Francisco Estuary Institute, Richmond, CA. Contribution # 867. 130 pages.
- Sutton, R. and Sedlak, M. 2015. Contaminants of Emerging Concern in San Francisco Bay: A Strategy for Future Investigations. 2015 Update. San Francisco Estuary Institute, Richmond, CA. Contribution # 761.
- Sutton, R., Sedlak, M., Sun, J., and Lin, D. 2017. Contaminants of Emerging Concern in San Francisco Bay: A Strategy for Future Investigations. 2017 Revision. San Francisco Estuary Institute, Richmond, CA. Contribution # 851.
- Sutton, R., Sedlak, M., and Yee, D. 2013. Contaminants of Emerging Concern in San Francisco Bay: A Strategy for Future Investigations. San Francisco Estuary Institute, Richmond, CA. Contribution # 700.

**Appendix A**

**SCVURPPP Sediment Monitoring Stations in WY 2019**

**Appendix A. SCVURPPP Sediment Monitoring Stations in WY 2019.**

Samples analyzed for PCBs, mercury, and total solids.

Station	Date	Latitude	Longitude
SC-SCL-02-M	06-03-19	37.37132	-121.95014
SC-SCL-05-F	06-03-19	37.37177	-121.95064
SC-SCL-05-G	06-03-19	37.35885	-121.93509
SC-SCL-05-H	06-03-19	37.36997	-121.95508
SC-SCL-06-C	06-03-19	37.37639	-121.95061
SC-SCL-23-G	06-03-19	37.35885	-121.93509
SC-SJY-17-I	08-12-19	37.35818	-121.86908
SC-SJY-17-J	08-12-19	37.35823	-121.86883
SC-SJY-17-K	08-12-19	37.35835	-121.86815
SC-SJY-17-L	08-12-19	37.35998	-121.86689
SC-SJY-17-M	08-12-19	37.36254	-121.86877
SC-SJY-17-N	08-12-19	37.362241	-121.86896
SC-SJY-17-O	08-12-19	37.36369	-121.86987
SC-SJY-08-X	08-12-19	37.37377	-121.89863
SC-SJY-08-Y	08-12-19	37.37263	-121.89857
SC-SJY-08-Z	08-12-19	37.37256	-121.89876
SC-SJY-47-M	08-13-19	37.30973	-121.86538
SC-SJY-47-N	08-13-19	37.30999	-121.87009
SC-SJY-04-C	08-13-19	37.38208	-121.92656
SC-SJY-04-D	08-13-19	37.382538	-121.92707
SC-SJY-04-E	08-13-19	37.39346	-121.91459
SC-SJY-04-F	08-13-19	37.39172	-121.91211
SC-SJY-17-P	08-19-19	37.36248	-121.87145
SC-SJY-17-Q	08-19-19	37.36237	-121.87163
SC-SJY-17-R	08-19-19	37.36280	-121.87098
SC-SJY-17-T	08-19-19	37.35993	-121.86637
SC-SJY-14-B	08-19-19	37.36539	-121.87803
SC-SJY-14-C	08-19-19	37.36531	-121.87824
SC-SJY-14-D	08-19-19	37.36537	-121.87788
SC-SJY-14-E	08-19-19	37.36549	-121.87803
SC-SJY-14-F	08-19-19	37.36484	-121.87876
SC-SJY-14-H	08-19-19	37.36394	-121.88052
SC-SJY-14-I	08-19-19	37.36447	-121.87997
SC-SJY-14-J	08-19-19	37.36473	-121.97894
SC-SJY-14-K	08-20-19	37.36307	-121.88099
SC-SJY-14-L	08-20-19	37.36336	-121.88118
SC-SJY-14-M	08-20-19	37.36246	-121.88313
SC-SJY-04-H	08-20-19	37.38756	-121.91387
SC-SJY-04-I	08-20-19	37.38920	-121.91207
SC-PAO-08-A	08-20-19	37.41609	-122.14466
SC-PAO-08-B	08-20-19	37.41761	-122.14334
SC-PAO-08-C	08-20-19	37.41709	-122.14123
SC-SJY-04-J	08-27-19	37.38067	-121.93162
SC-SJY-04-K	08-27-19	37.38226	-121.93157
SC-SJY-04-L	08-27-19	37.38498	-121.94165
SC-SJY-04-M	08-27-19	37.38137	-121.92017
SC-SJY-04-N	08-27-19	37.38481	-121.92031
SC-SJY-04-O	08-27-19	37.38495	-121.92042
SC-SJY-04-P	08-27-19	37.38594	-121.92146
SC-SJY-08-AB	08-27-19	37.37121	-121.90037
SC-SJY-08-AC	08-27-19	37.37126	-121.90006
SC-SJY-08-AD	08-27-19	37.37138	-121.90017
SC-SJY-04-R	08-28-19	37.38224	-121.93524
SC-SJY-10-R	08-28-19	37.37849	-121.90899
SC-SJY-10-S	08-28-19	37.37789	-121.90991
SC-SJY-47-O	08-28-19	37.30929	-121.86487