cleanwater
PROGRAM

Protecting Alameda County Creeks, Wetlands & the Bay

399 Elmhurst St.
Hayward, CA
94544
p. 510-670-5543

MEMBER AGENCIES:
Alameda
Albany
Berkeley
Dublin
Emeryville
Fremont
Hayward
Livermore
Newark
Oakland
Piedmont
Pleasanton
San Leandro
Union City
County of Alameda
Alameda County Flood Control and Water Conservation District
Zone 7 Water Agency

October 12, 2018

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

SUBJECT: **SUBMITTAL OF THE ALAMEDA COUNTYWIDE CLEAN WATER PROGRAM POLLUTANTS OF CONCERN MONITORING REPORT FOR WATER YEAR 2018**

Dear Bruce:

As you know, various submission and reporting provisions of the Municipal Regional Stormwater Permit (MRP) authorize Permittee implementation and compliance though coordination of the countywide stormwater programs. The member agency Permittees of the Alameda Countywide Clean Water Program (ACCWP) through their Management Committee, and in conformance with the Memorandum of Agreement signed by their governing bodies, have authorized and directed me to prepare and submit certain reports as part of their compliance with submission of MRP-required reports.

Therefore, with this letter, I am submitting this ACCWP Pollutants of Concern Monitoring Report for Water Year 2018 on behalf of and for the benefit of the ACCWP member agency Permittees. By signing this letter on behalf of ACCWP, I certify under penalty of law that these documents 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. [40CFR 122.22(d)].

Sincerely,

James Scanlin
Program Manager

Attachments: Certification Statement (1 page)
ACCWP Pollutants of Concern Monitoring Report

Certification Statement

Report contents

This submittal by the Alameda Countywide Clean Water Program of the Pollutants of Concern Monitoring Report for Water Year 2018 is in compliance with provision C.8.h.iv of the MRP in reporting monitoring accomplishments and planned efforts pursuant to MRP Provision C.8.f, Pollutants of Concern Monitoring.

Third party monitoring

Please note that consistent with provision C.8.a.iv of the original MRP (Order R2-2009-074) in effect during part of the reporting period and C.8.a.iii of the reissued MRP (Order R2-2015-0049), portions of the water quality monitoring requirements were fulfilled or partially fulfilled by third party monitoring in Water Year 2017, as described in Section 1.3 of the attached Pollutants of Concern Monitoring Report:

- The Regional Monitoring Program for Water Quality in San Francisco Bay (RMP) conducted a portion of the data collection in Water Year 2017 on behalf of Permittees, pursuant to provision C.8.f. The results of that monitoring will be reported as available in the Urban Creeks Monitoring Report for Water Year 2018.

- Additionally, data addressing the Trends monitoring information need described in C.8.f was collected by the State of California's Surface Water Ambient Monitoring Program (SWAMP) through its Stream Pollutant Trend Monitoring Program at two Alameda County locations. As stated in provision C.8.a.iii Permittees may continue using these data to comply with applicable monitoring requirements included in provision C.8.f. The schedule for SWAMP's review and reporting of data collected pursuant to this provision, however, differs from the schedule described in the MRP.

Per provision C.8.a.iv of the original MRP, the Permittees requested in March 2013 that the Executive Officer adjust the MRP due dates for these reporting deliverables to synchronize with the third party reporting schedules of SWAMP and the RMP, and we ask that this adjustment be continued for the current permit term.

ALAMEDA COUNTYWIDE CLEAN WATER PROGRAM

POLLUTANTS OF CONCERN MONITORING REPORT 2018

MEMBER AGENCIES:

Alameda
Albany
Berkeley
Dublin
Emeryville
Fremont
Hayward
Livermore
Newark
Oakland
Piedmont
Pleasanton
San Leandro
Union City
County of Alameda
Alameda County Flood Control and Water Conservation District
Zone 7 Water Agency

Report prepared by
Alameda Countywide Clean Water Program
399 Elmhurst Street,
Hayward, California 94544

Submitted to:
California Regional Water Quality Control Board, San Francisco Bay Region

October 12, 2018

Protecting Alameda County Creeks, Wetlands & the Bay

Acknowledgements

Applied Marine Sciences contributed site information and maps to this report. Geosyntec Consultants contributed to the writing and preparation of this report.

Preface

This *Pollutants of Concern Monitoring Report 2018* was prepared by the Alameda Countywide Clean Water Program (Program, ACCWP) per the Municipal Regional Permit (MRP, NPDES Permit No. CAS612008; Order No. R2-2015-0049) for urban stormwater issued by the San Francisco Bay Regional Water Quality Control Board. This report fulfills the requirements of MRP Provision C.8.h.iv for a report describing the allocation of sampling effort for Pollutant of Concern (POC) monitoring for the forthcoming year (i.e., the water year that began October 1 of that year) and what was accomplished for POC monitoring during the preceding water year.

This report is submitted by ACCWP on behalf of the following Permittees:

- The cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City;
- Alameda County;
- Alameda County Flood Control and Water Conservation District; and
- Zone 7 of the Alameda County Flood Control and Water Conservation District (Zone 7 Water Agency).

List of Acronyms

Acronym	Definition
ACCWP	Alameda Countywide Clean Water Program (also Program)
BASMAA	Bay Area Stormwater Management Agencies Association
BMP	Best Management Practice
BSM	Bioretention Soil Media
CEC	Chemicals of Emerging Concern
CEDEN	California Environmental Data Exchange Network
DTSC	California Department of Toxic Substances Control
FY	Fiscal Year
mg/kg	milligrams per kilogram (parts per million)
MPC	BASMAA Monitoring and Pollutants of Concern Committee
MRP	Municipal Regional Stormwater Permit
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
PBDEs	Polybrominated Diphenyl Ethers
PCBs	Polychlorinated Biphenyls
PFAS	Perfluoroalkyl Sulfonates
PFOS	Perfluorooctane Sulfonates
POC	Pollutant of Concern
RMC	BASMAA Regional Monitoring Coalition
RMP	Regional Monitoring Program for Water Quality in San Francisco Bay
ROW	Right-of-Way
SAP	Sampling and Analysis Plan
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board (also Regional Water Board)
SFEI	San Francisco Estuary Institute
SPoT	SWAMP Statewide Stream Pollutant Trends Monitoring
SSC	Suspended Sediment Concentration
STLS	Small Tributaries Loading Strategy
SWAMP	Surface Water Ambient Monitoring Program
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
UCMR	Urban Creeks Monitoring Report
USEPA	US Environmental Protection Agency
WY	Water Year

Table of Contents

Acknowledgements i
Preface ii
List of Acronyms iii
1 Introduction 1
1.1 MRP Requirements and Report Organization 1
1.2 Background 1
1.3 Related Regional Activities and Third-Party Data 4
1.4 Reporting for MRP Provision C.8. 9
2 POC Monitoring Accomplishments in WY 2018 10
2.1 Summary of Alameda County POC Monitoring by Parameter and Monitoring Type 16
3 Planned POC Monitoring in WY 2019 18
4 References 19

List of Tables

Table 1-1. Types and Methods of POC monitoring conducted by ACCWP and third parties..... 8

Table 1-2. Index to Standard Reporting Content for POC Monitoring. 9

Table 2-1. WY 2018 POC monitoring sites sampled by ACCWP and third parties. 10

Table 2-2. Summary of ACCWP POC monitoring samples collected in WY 2018 and cumulatively from WY 2016 – WY2018. 17

Table 2-3. Summary of ACCWP POC monitoring samples collected from WY 2016 – WY2018 and number required by MRP. 17

List of Figures

Figure 2-1. WY 2018 POC Urban Sediment Sampling Sites: Berkeley, Emeryville and North Oakland. 12

Figure 2-2. WY 2018 POC Urban Sediment Sampling Sites by ACCWP: South Oakland, San Leandro and Hayward. Two Hayward sites (ROW18-24 and ROW18-25) analyzed Hg only as a follow-up to WY 2016 results. 13

Figure 2-3. WY 2018 POC Sampling Sites by ACCWP. White icons indicate wet weather Pesticides and Toxicity sites with POC water quality samples; blue icons indicate dry weather sampling locations with both bedded sediment and water quality samples. 14

Figure 2-4. WY 2018 POC Sampling Sites by the RMP 16

1 Introduction

1.1 MRP Requirements and Report Organization

This *Pollutants of Concern Monitoring Report 2018* was prepared by the Alameda Countywide Clean Water Program (ACCWP) per the Municipal Regional Stormwater Permit (MRP) issued by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB; Order No. R2-2015-0049). This report fulfills the requirements of MRP Provision C.8.h.iv to submit a report describing the allocation of sampling effort for Pollutants of Concern (POC) monitoring for the forthcoming water year (WY 2019; October 1, 2018 – September 30, 2019) and what was accomplished for POC monitoring during the preceding water year (WY 2018).

The introduction to this report provides an overview of MRP requirements and relevant POC monitoring activities by ACCWP and third parties. Section 2 includes the following information for the preceding Water Year, while Section 3 contains equivalent information projected for the forthcoming year, as available:

- Monitoring locations, with latitude-longitude coordinates;
- Number of samples collected and the method of collection or sub-type as classified in MRP Table 8.1;
- Purpose of sampling (i.e., specific relevance to the management question addressed); and
- Analytes measured.

1.2 Background

MRP Provision C.8.f, POC Monitoring, requires monitoring directed toward addressing the following five priority POC management information needs. Monitoring is specified by Monitoring Type 1 through 5, as follows:

<u>Monitoring Type 1: Source Identification</u> - identifying which sources or watershed source areas provide the greatest opportunities for reductions of POCs in urban stormwater runoff;

<u>Monitoring Type 2: Contributions to Bay Impairment -</u> 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);

<u>Monitoring Type 3: Management Action Effectiveness</u> - providing support for planning future management actions or evaluating the effectiveness or impacts of existing management actions;

<u>Monitoring Type 4: Loads and Status</u> - providing information on POC loads, concentrations, and presence in local tributaries or urban stormwater discharges; and

Monitoring Type 5: Trends - evaluating trends in POC loading to the Bay and POC concentrations in urban stormwater discharges or local tributaries over time.

Not all of the above information need apply to all POCs; MRP Tables 8.1 and 8.2 specify the minimum monitoring types (corresponding to the above information needs), methods, and frequencies of monitoring for each countywide stormwater program for the following POCs or POC groups:

- Polychlorinated biphenyls (PCBs) and total mercury, for monitoring types 1-5;
- Copper, for monitoring types 4-5;
- Nutrients (ammonium, nitrate, nitrite, total Kjeldahl nitrogen, orthophosphate and total phosphorus to be analyzed in each sample), for monitoring type 4.
- Emerging Contaminants, which are to be addressed by a special study that addresses relevant management information needs for emerging contaminants (see section 1.3 below); and
- Ancillary Parameters as necessary for each sample to address management questions for the above POCs, e.g. Total Organic Carbon (TOC) concurrent with PCBs where normalizing concentrations in water or sediment, Suspended Sediment Concentration (SSC) for water samples analyzed for PCBs or mercury for monitoring types 3, 4 or 5, and hardness in conjunction with copper samples from fresh water.

ACCWP's POC monitoring activities during the permit term will be coordinated with information needs for other permit-related activities, which include:

- **Planning and implementation of PCB and mercury controls** to achieve total maximum daily load (TMDL) load reductions are driven by targets for PCB load reductions, but mercury reductions are also to be considered and accounted for when addressing most of the following:
    - Provisions C.11/12.a require Permittees to identify watersheds and management areas where control measures are currently being implemented and/or will be implemented during the permit term. Beginning in WY 2014, ACCWP and other BASMAA programs developed screening and sampling steps to identify on-land PCB sources for abatement and to characterize broader areas with high likelihood of PCB discharge as described in ACCWP 2016 (monitoring type 1). Ongoing sampling of urban sediments in publicly owned rights-of way (ROWs) is an important tool for refining the initial descriptions of management areas delineated in ACCWP (2017b) and thus supports identification and application of additional control measures in these areas (indirectly, monitoring type 3). For screening purposes samples are analyzed for total mercury, PCB congeners by EPA method 8082, TOC, % fines, and

density. Due to the difficulty of associating individual sediment samples to specific source properties, in WY 2017 ACCWP added a screening strategy of compositing surface sediments from broader "interest areas" or "halos" that surround groups of High or Medium Likelihood parcels.

  - Provisions C.11/12.b require MRP Permittees to develop and implement an assessment methodology and data collection program to quantify mercury and PCB loads reduced through implementation of pollution prevention, source control, and treatment control measures. BASMAA (2017) built on previously developed methodologies described in MRP provision C.12 and the MRP Fact Sheet to provide an interim methodology to be used during this permit term, based on relative yields of mercury and PCB from different land use categories. The report's default yield coefficients are estimates of the mass of each POC contributed by an area of a particular land use per unit time, derived mainly from previous source identification studies (monitoring type 1) or watershed monitoring (monitoring types 2 or 4). New monitoring data collected during this permit term may be considered in future recommendations for updates to the yield-based accounting system.
  - Provisions C.11/12.c and d include requirements for reasonable assurance analyses (RAAs) demonstrating that sufficient Green Infrastructure and other control measures will be implemented to attain the TMDL wasteload allocations at milestone dates in the future. ACCWP started preparation of the countywide RAA in WY 2018, which, in combination with monitoring data, will provide information on POC loads (monitoring type 4).
  - Provision C.12.e requires Permittees to collect at least 20 composite samples (throughout the permit-area) of and other sealants used in storm drains and between concrete curbs and street pavement and investigate whether PCBs are present in such material and in what concentrations, as a subtype of source identification (monitoring type 1). A BASMAA regional project to satisfy this requirement was conducted in WY 2018; ACCWP will share credit with the other large programs for the sampling conducted as part of this project.

- MRP Permittees have agreed to collectively conduct a POC monitoring project for **management action effectiveness** (monitoring type 3) via BASMAA. The overall goal of the project is to evaluate the effectiveness of selected stormwater treatment controls in order to provide information needed to support RAA development. BASMAA members agreed to focus this monitoring effort on two treatment options that have the potential to reduce PCBs discharges: (1) hydrodynamic separators (HDS units) and (2) enhanced bioretention filters. HDS monitoring is focused on collecting sediment removed from HDS unit sumps during maintenance to evaluate the PCBs and mercury load reduction effectiveness of these units. Enhanced bioretention monitoring is focused on testing

biochar media amendments to identify those that improve PCBs and mercury load removal by bioretention BMPs. The project team conducted monitoring activities and initiated data analysis and reporting in WY 2018. It is anticipated that the final project report will be submitted to the Regional Water Board in March 2019.

- **Pesticides and Toxicity Monitoring** (Provision C.8.g) requires wet weather and dry weather monitoring of water toxicity in urban creeks along with dry weather toxicity testing and chemical analyses of fine-grained depositional sediment. For WY 2018, ACCWP selected two new dry weather toxicity and sediment chemistry monitoring sites at the base of urban watersheds which, along with the WY 2016 and 2017 sites, are also suitable for characterizing the status of copper and nutrients and building a baseline for future trends monitoring (monitoring types 4 and 5)[1]. Copper analysis is required for sediment samples per MRP Table 8.5 and for water samples per MRP Table 8.3 . During WY 2018, ACCWP conducted wet weather toxicity and pesticide monitoring collaboratively through the BASMAA Regional Monitoring Coalition (RMC). Ten samples were collected through the RMC and ACCWP collected and analyzed samples from three locations from a single storm event as part of this regional effort.
- **Creek Status Monitoring** (Provision C.8.d) includes sampling of nutrients in association with biological assessment sampling. At present, the selection of sampling sites is determined by a regional probabilistic design and screening. A BASMAA Regional Monitoring Coalition Five-Year Bioassessment Report Water Years 2012 – 2016, which describes this monitoring and analyzes the bioassessment data, will be finalized in WY 2019. Future POC monitoring of types 4 and 5 may be coordinated with Creek Status sites according to guidance on information needs from the San Francisco Bay Nutrient Management Strategy (described below).

1.3 Related Regional Activities and Third-Party Data

MRP Provision C.8.a.iii allows Permittees to use data collected by a third-party organization to fulfill a monitoring requirement, provided the data are demonstrated to meet data quality objectives comparable to those of the statewide Surface Water Ambient Monitoring Program (SWAMP) as described in Provision C.8.b. This section briefly describes third-party data collection activities by two programs that meet these criteria and are relevant to ACCWP's POC Monitoring objectives as summarized in Section 1.4:

[1] One of these sites, 204CVY010 at Castro Valley Creek, was extensively used for stormwater monitoring in earlier permits and may be useful in the future for confirming long-term trends in copper concentrations in water as a mandated phase-out is implemented of copper in vehicle brake pads. This site was sampled in 2017.

- The Regional Monitoring Program (RMP)
- The Stream Pollution Trends (SPoT) Monitoring Program, which is the long-term trends component of SWAMP.

The **RMP Small Tributaries Loading Strategy** (STLS) coordinates monitoring efforts between BASMAA and the RMP to address the management information needs identified above. Ongoing design and priorities are set by the STLS Team, which includes representatives from BASMAA, Regional Water Board staff, RMP staff from San Francisco Estuary Institute (SFEI) and technical advisors. The STLS Multi-Year Plan was originally developed to provide an alternative monitoring approach to default requirements in Provision C.8.e of the previous MRP (R2-2009-0074), which listed management information needs similar to those in the current permit.

Watershed monitoring is a major element of the STLS, and SFEI's efforts in this area during WYs 2015 through 2018 focused on a "Characterization Reconnaissance" monitoring design that reflects an increasing focus towards finding watersheds and land areas within watersheds that contain PCB sources (monitoring types 1 and 2) and could be candidates for management actions by stormwater programs. In addition to watershed monitoring, RMP-funded elements of the STLS include a Regional Watershed Spreadsheet Model for estimating pollutant loads to the Bay, for which calibration can be improved and updated loads using results from the characterization monitoring (monitoring type 4) and a Long-Term Trends Strategy to guide future monitoring design that will apply to monitoring type 5.

SFEI staff collaborated with BASMAA stormwater programs to identify suitable locations for collection of composite stormwater grab samples that were analyzed for PCBs, total mercury, total metals, SSC, grain size and TOC/DOC. Priority sites in Alameda County target channels or outfalls in older industrial drainages that are often tidally influenced, which limits their ability to be sampled based on the timing of storm events in relation to the tidal cycle. In WY 2018, two Alameda County sites were sampled as described in Section 2.

The **RMP PCB Strategy** is engaged in a multi-year effort to develop conceptual models of PCB fate and transport in selected nearshore portions of SF Bay called Priority Margin Units (PMUs), in order to clarify contributions from adjacent watersheds to Bay impairment, inform future management decisions, and track of trends in PCB loads from those watersheds. The Emeryville Crescent was the first PMU to be studied, using available data from the RMP and other sources, in 2015-2016. The Conceptual Model Report concluded that the Crescent experiences relatively quick turnover of PCB loads through exchange of water and sediment with the open Bay, and that foodweb monitoring would be a promising indicator for tracking future response to projected load reductions in the watershed.

The second conceptual model study, developed for San Leandro Bay, is being conducted in phases. RMP funding for conceptual model development was substantially augmented by funding from two Supplemental Environmental Projects (SEPs). The Phase One Data Report (Yee et al., 2017) was a deliverable for the first SEP, which supported both development of the conceptual model and an extensive field study of PCB concentrations in San Leandro Bay. The Phase Two Data Report (Davis et al., 2017) reported on the field studies conducted to support development of the conceptual model. PCBs were analyzed in sediment, water and biota (sport fish, small prey fish, and benthos) collected at the confluence of 3 main "inputs" to San Leandro Bay: Airport Channel, the confluence of San Leandro Creek and Damon Slough (Zone 12 Line K) and the Oakland Estuary channel between Oakland and Alameda.

Additional field data will be generated by a study of fish gut contents as well as additional stormwater sampling in one watershed (Line 12H at Coliseum Way, downstream of the General Electric Oakland property). This work and a final conceptual model report that incorporates all of the data from Phase 1, Phase 2, and the additional data will be completed in WY 2019.

The **RMP Chemicals of Emerging Concern (CECs) Strategy** is a "living" document developed by the RMP Emerging Contaminants Work Group to guide RMP special studies on CECs using a tiered risk and management action framework. BASMAA's representatives to the various RMP workgroups and Technical Review Committee are working to ensure that this strategy will address the requirement in MRP Table 8.2 that Permittees conduct or cause to be conducted a special study that addresses relevant management information needs for emerging contaminants[2].

The RMP also provides support for the **San Francisco Bay Nutrient Management Strategy**, an initiative begun in 2012 to develop scientific information needed to make decisions about assessing and managing potential nutrient impacts to the Bay. The STLS Team has asked SFEI staff working on the Nutrient Strategy about information needs regarding nutrients in stormwater but to date has not received any response suggesting additional nutrient data would be useful from the STLS characterization sites, which have been selected based on likelihood of PCB sources.

The main goal of the **SPoT Monitoring Program** is to determine long-term trends in stream contaminant concentrations and effects statewide. For this purpose the program has established a network of approximately 100 sites throughout the state where it samples depositional stream

[2] The special study must account for relevant CECs in stormwater and would address at least perfluorooctane sulfonates (PFOS), perfluoroalkyl sulfonates (PFAS), and alternative flame retardants being used to replace PBDEs. The Emerging Contaminant Work Group (ECWG) has completed studies addressing PFOS and PFAS and has budgeted a 2019 Conceptual Model report on alternative flame retardants (AFRs). The STLS Team assisted in developing the AFR project concept and provided planning assistance to the ECWG for more detailed study scoping during 2018.

sediments collected near the base of watersheds[3]. Bay Area sites selected by Regional Water Board staff include two in Alameda County which are identified in Section 2.

Tier 1 contaminants analyzed at all SPoT sites include total mercury, copper and other metals, and PCB congeners (analyzed by EPA Method 8082M). After the first 5 years of mostly annual monitoring Phillips et al. (2014) recommended that the monitoring design be modified so that half of the sites continue to be sampled annually while the other half are sampled biannually, rotating in two groups to allow reallocation of funds for analysis of additional parameters at some sites. After the re-design for SPoT went into effect in 2015, fifty sites are considered "core" sites and are sampled every year, including the two Alameda County sites (Phillips et al. 2016). Results of SPoT 2013 and 2014 monitoring are included in the current 7-year report (Phillips et al. 2016). A ten-year synthesis report is planned to include data collected through 2017, with a draft expected by late 2018 (Bryn Phillips, pers. comment).

Table 1-1 summarizes the types and methods of monitoring used in relevant POC monitoring by ACCWP or third parties, as described above in Sections 1.2 and 1.3. The “Type-Method” abbreviations are used in the tables in Sections 2 and 3 to reference the management question(s) and details of sample matrix and collection methods as described in this table.

[3]SPoT’s original design targeted large watersheds, but Regional Water Board staff, in consultation with BASMAA representatives, recommended sampling a range of sizes of urbanized Bay Area watersheds.

Table 1-1. Types and Methods of POC monitoring conducted by ACCWP and third parties.

Sample Type-Matrix Abbreviation	Sample Matrix	Type of Sampling Event/ Location	POCs	Sampling program (note)
1-SU	Sediment, urban	Dry weather/ on or near ROW surface receiving runoff from potential/likely source	PCBs, mercury	ACCWP (may be composited)
5-SU	Sediment, urban	Dry weather/ on or near ROW surface receiving runoff from potential/likely source, follow up samples	mercury	ACCWP (may be composited)
1,2-SU	Sediment, urban	Dry weather/ ROW surfaces in interest area containing potential/likely source(s)	PCBs, mercury	ACCWP (composited)
1,2-SB	Sediment, bedded	Dry weather/ in MS4 facilities or local channels	PCBs, mercury	ACCWP
1,2,4-WW	Runoff	Stormwater grab or composite/ lower watershed site	PCBs, mercury, some copper	RMP-STLS (characterization)
1,3-Caulk	Caulk or sealant	Dry weather / storm drainage and roadway infrastructure or building structure	PCBs	BASMAA (regional project)
3-WW	Runoff	Stormwater influent/effluent samples from BMPs or experimental microcosms	PCBs, mercury	BASMAA (regional project)
4,5-WD	Runoff	Dry weather grab sample/ lower watershed integrative site	Copper, nutrients	ACCWP (Pesticides & Toxicity sites)
4,5-WW	Runoff	Stormwater grab or composite/ lower watershed integrative site	Copper, nutrients	ACCWP (Pesticides & Toxicity sites)
4,5-SB	Sediment, bedded in channel	Dry weather/ fine grained at lower watershed integrative site	Copper	ACCWP (Pesticides & Toxicity sites)
5-WW	Runoff	Details of design to be determined by STLS Long Term Trends Strategy	PCBs, mercury	RMP-STLS (Long-term Trends)
5-SB	Sediment, bedded in channels	Dry weather / lower watershed integrative site	PCBs, mercury, copper	SPoT

1.4 Reporting for MRP Provision C.8.

The MRP requires the following submittals by March 31 of each year:

- Electronic Reporting (C.8.h.ii)
- Urban Creeks Monitoring Report (UCMR, C.8.h.ii).

Table 1-2 lists Standard Report Content for monitoring reports as described in MRP Provision C.8.h.vi and shows the distribution of the required content among this report and the above reporting deliverables.

Table 1-2. Index to Standard Reporting Content for POC Monitoring.

Standard Report Content	This Report	March 2017 submittal
(1) The purpose of the monitoring and briefly describe the study design rationale	Sections 2,3	UCMR
(2) Quality Assurance/Quality Control summaries for sample collection and analytical methods, including a discussion of any limitations of the data	N/A	UCMR
(3) Brief descriptions of sampling protocols and analytical methods	By reference only	UCMR, by reference
(4) Sample location description, including water body name and segment and latitude and longitude coordinates	Section 2 (coordinates only)	UCMR
(5) Sample ID, collection date (and time if relevant), media (e.g., water, filtered water, bed sediment, tissue)	Sections 2,3 (as available)	UCMR and Electronic Reporting
(6) Concentrations detected, measurement units, and detection limits	N/A	UCMR and Electronic Reporting
(7) Assessment, analysis, and interpretation of the data for each monitoring program component	Section 2 (Narrative)	UCMR
(8) A listing of volunteer and other non-Permittee entities whose data are included in the report	Section 1.3	UCMR
(9) Assessment of compliance with applicable water quality standards.	N/A	UCMR

2 POC Monitoring Accomplishments in WY 2018

In WY 2018, ACCWP and third parties collected a total of 48 samples in eight monitoring Type-method categories, as summarized in Table 2-1.

Table 2-1. WY 2018 POC monitoring sites sampled by ACCWP and third parties.

Station Code or Sample ID	Sampling Program	Latitude	Longitude	Sample Date	Type-Method	Analytes
ROW18-01	ACCWP	37.85351	-122.29525	9/17/2018	1-SU (*5-SU)	Mercury, PCBs (*follow-up samples, analyzed for mercury only)
ROW18-02	ACCWP	37.83482	-122.29390	9/17/2018		
ROW18-03	ACCWP	37.83388	-122.29379	9/17/2018		
ROW18-04	ACCWP	37.83467	-122.28716	9/17/2018		
ROW18-05	ACCWP	37.82242	-122.28193	9/17/2018		
ROW18-06	ACCWP	37.82120	-122.28424	9/17/2018		
ROW18-07	ACCWP	37.82025	-122.28621	9/17/2018		
ROW18-08	ACCWP	37.82450	-122.29949	9/17/2018		
ROW18-09	ACCWP	37.82076	-122.29536	9/17/2018		
ROW18-10	ACCWP	37.81703	-122.29538	9/17/2018		
ROW18-11	ACCWP	37.81076	-122.28858	9/18/2018		
ROW18-12	ACCWP	37.80306	-122.29911	9/18/2018		
ROW18-13	ACCWP	37.80315	-122.29339	9/18/2018		
ROW18-14	ACCWP	37.80282	-122.29486	9/18/2018		
ROW18-15	ACCWP	37.79806	-122.28912	9/18/2018		
ROW18-16	ACCWP	37.77980	-122.24324	9/18/2018		
ROW18-17	ACCWP	37.77737	-122.22961	9/18/2018		
ROW18-18	ACCWP	37.76818	-122.21843	9/19/2018		
ROW18-19	ACCWP	37.76688	-122.21633	9/19/2018		
ROW18-20	ACCWP	37.76538	-122.20592	9/19/2018		
ROW18-21	ACCWP	37.75719	-122.19822	9/19/2018		
ROW18-22	ACCWP	37.75309	-122.19498	9/19/2018		
ROW18-23	ACCWP	37.71698	-122.18855	9/19/2018		
ROW18-24*	ACCWP	37.65377	-122.12695	9/19/2018		
ROW18-25*	ACCWP	37.63713	-122.13179	9/19/2018		
204AVJ020	ACCWP	37.76212	-122.17640	7/18/2018	4,5-WD (4,5-SB, copper only)	Copper, nutrients
204LME100	ACCWP	37.81837	-122.26052	7/18/2018		
205R01198	ACCWP	37.50917	-121.96423	1/8/2018	4,5-WW	Copper, nutrients
204CVY010	ACCWP	37.68165	-122.08063	1/9/2018		
204SAU030	ACCWP	37.78593	-122.22430	1/9/2018		
5 caulk sample sites, not geo-referenced	BASMAA Regional Project	NA	NA	11/8/2017	1,3-caulk	PCBs

Station Code or Sample ID	Sampling Program	Latitude	Longitude	Sample Date	Type-Method	Analytes
Outfall at Gilman Street	RMP-STLS (long-term trends)	37.877608	-122.309836	1/9/18	5-WW	Mercury, PCBs
Zone 12 Line A at Shellmound St. Pedestrian Bridge	RMP-STLS (characterization)	37.834237	-122.29352	1/8/18	1,2,4-WW	Mercury, PCBs
204ALA020	SPoT	37.582	-122.052	May or June	5-SB	Mercury, PCBs, Copper
204SLE030	SPoT	37.72556	-122.18361			
9 samples, not georeferenced	BASMAA BMP Effectiveness	NA	NA	2017/2018	3-WW	Mercury, PCBs

The largest group of samples were urban right-of way sediments (type 1-SU) to support identification of PCB sources, collected in Old Industrial areas of Berkeley, Emeryville, Oakland, San Leandro, and Hayward, as shown in Figure 2-1 and Figure 2-2. This was a continuation of earlier PCB source screening efforts as reported in ACCWP (2017a) and ACCWP (2018) targeting suspected source properties identified through prior property review or sampling efforts. Sampling was conducted in September 2018 and initial laboratory results are expected in November / December 2018.

Figure 2-3 shows sampling sites monitored for POC analytes during WY 2018 wet and dry seasons. Wet season samples for analysis of nutrients, copper, and ancillary parameters were collected at three locations in association with MRP Provision C.8.g.iii Wet Weather Pesticides and Toxicity Monitoring efforts conducted through a BASMAA regional collaboration. Dry season water quality samples for analysis of nutrients, copper, and ancillary parameters and copper in bedded sediment were collected in conjunction with ACCWP's annual Creek Status Monitoring efforts.

In WY 2018, ACCWP participated in a BASMAA collaboration investigating PCBs in caulk and sealants pursuant to MRP Provision C.12.e, entitled Pollutants of Concern (POC) Monitoring for Source Identification and Management Action Effectiveness. As part of this effort, a total of 54 caulk and sealant samples were collected from ten different types of roadway and storm drain structures in the public ROW. Structures sampled included concrete bridges/overpasses, sidewalks, curbs and gutters, roadway surfaces, above and below ground storm drain structures (i.e., flood control channels and storm drains accessed from manholes), and electrical utility boxes or poles attached to concrete sidewalks. The individual samples were grouped by structure type and sample appearance (color and texture). The groups were combined into 20 composites. Composites were analyzed for the RMP-40 PCBs congeners. Five of these samples are credited to ACCWP. The samples were intentionally not geo-referenced when submitted for analysis, so no location data are provided here. A report documenting the results of the study was finalized in WY 2018 (BASMAA, 2018).

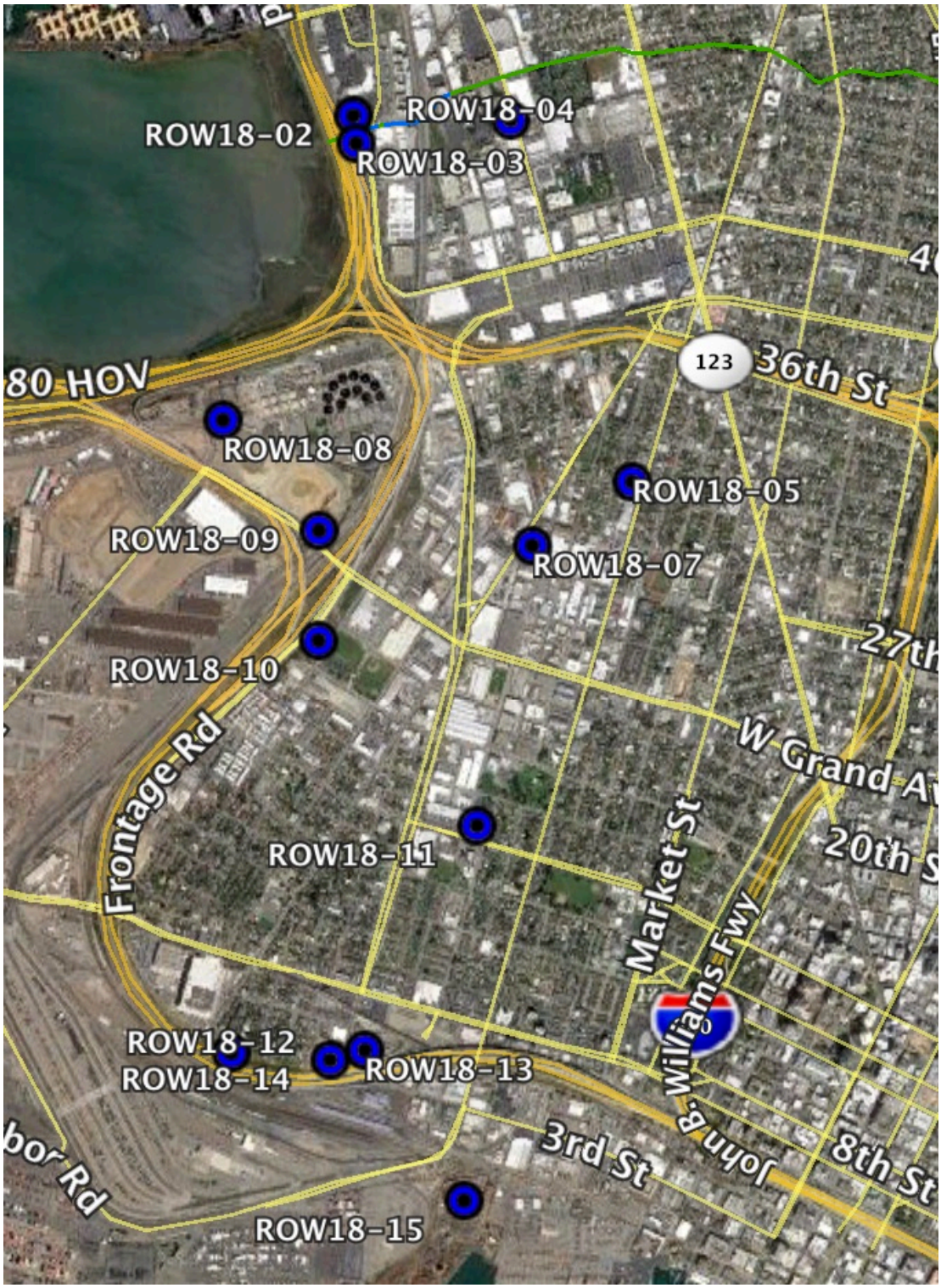

Figure 2-1. WY 2018 POC Urban Sediment Sampling Sites: Berkeley, Emeryville and North Oakland.

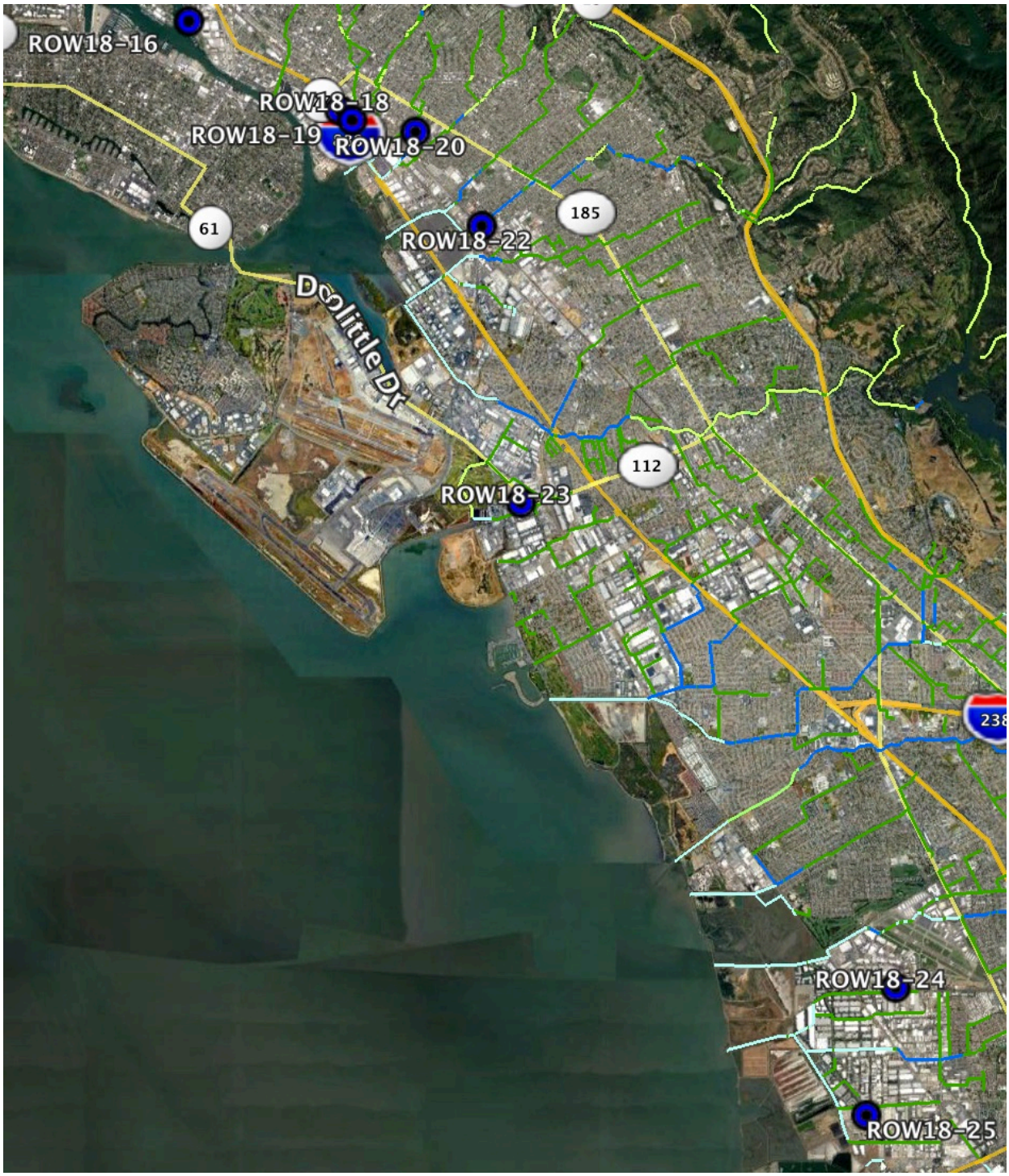

Figure 2-2. WY 2018 POC Urban Sediment Sampling Sites by ACCWP: South Oakland, San Leandro and Hayward. Two Hayward sites (ROW18-24 and ROW18-25) analyzed Hg only as a follow-up to WY 2016 results.

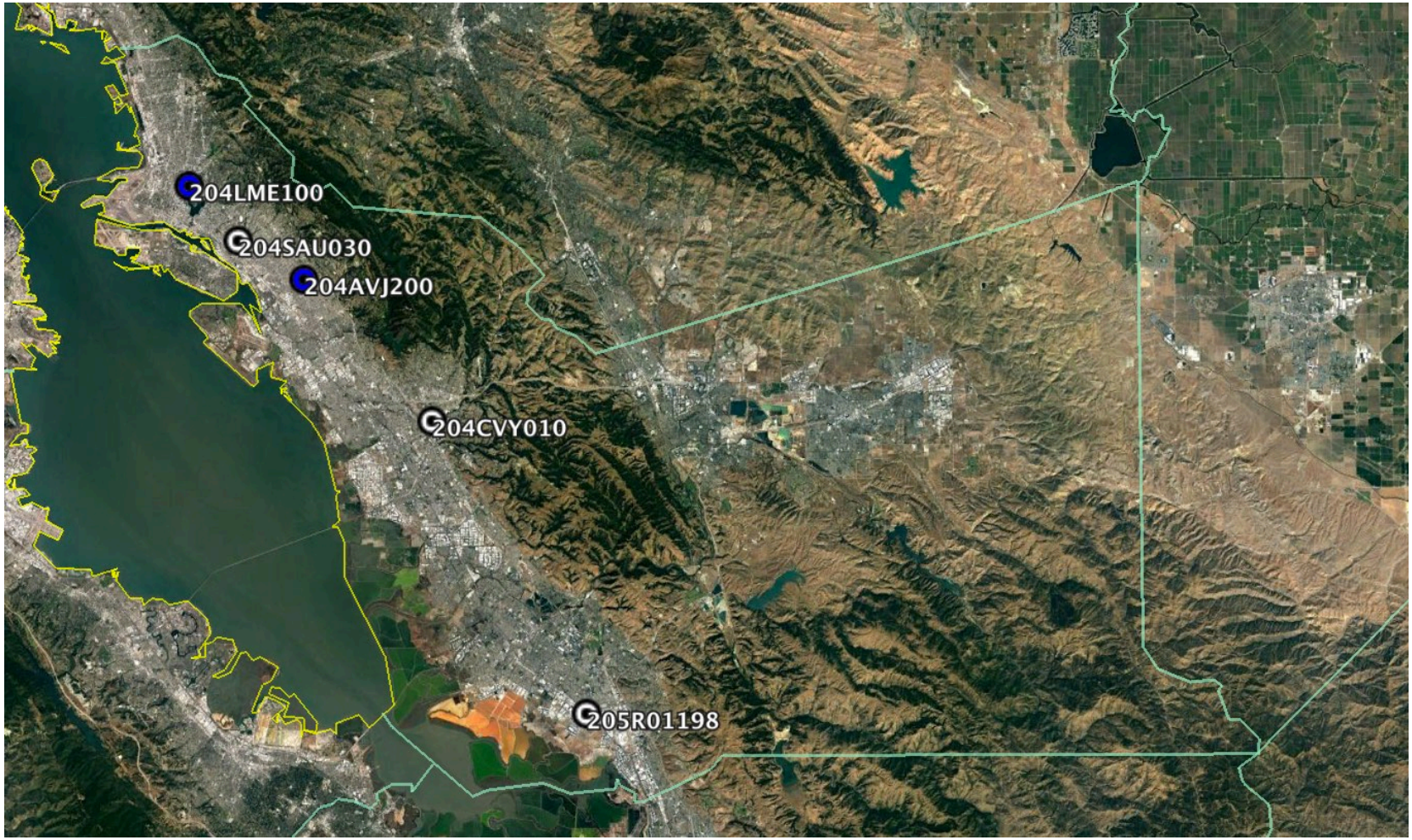

Figure 2-3. WY 2018 POC Sampling Sites by ACCWP. White icons indicate wet weather Pesticides and Toxicity sites with POC water quality samples; blue icons indicate dry weather sampling locations with both bedded sediment and water quality samples.

In WY 2018, ACCWP also participated in a BASMAA collaboration to develop a study design and conduct POC monitoring for BMP effectiveness. The following tasks were accomplished through the end of WY 2018:

- Developed an overall project schedule
- Identified the critical information needs for future RAAs in consultation with BASMAA
- Developed a final study design
- Developed a final Sampling and Analysis Plan and Quality Assurance Project Plan
- HDS Unit Sampling:
    - Conducted outreach efforts to recruit municipalities with public HDS units to participate in the project
    - Conducted monitoring at eight HDS units during regularly scheduled cleanouts. Three sediment samples and five leaf debris/sediment samples were collected.
    - HDS Units samples were submitted to the laboratory for analysis of the RMP-40 PCB congeners by EPA Method 1668 and Total Mercury by EPA Method 1631.
- Column Tests of Biochar-enhanced Bioretention Soil Media (BSM):
    - Selected five biochars for column testing and conducted hydraulic tests
    - Collected stormwater from two sites in Oakland during two storm events at each site;
    - Conducted three sampling runs using the collected stormwater for six columns - five selected biochar-enhanced BSM and one standard BSM as control; three influent samples and 18 effluent samples were collected;
    - Conducted one dilution run on two columns; one influent and two effluent samples were collected;
    - Conducted one repeated sampling run on one column; one influent and one effluent sample were collected;
    - Submitted the 26 influent/effluent samples to the laboratory for analysis of the RMP-40 PCBs by EPA Method 1668 and Total Mercury by EPA Method 1631.

Over the next water year (WY 2019), the project team will receive the laboratory data results, conduct all data analysis, and complete a final report. It is anticipated that the final project report will be submitted to the Regional Water Board in March 2019.

Figure 2-4 shows the WY 2018 RMP samples collected in Alameda County.

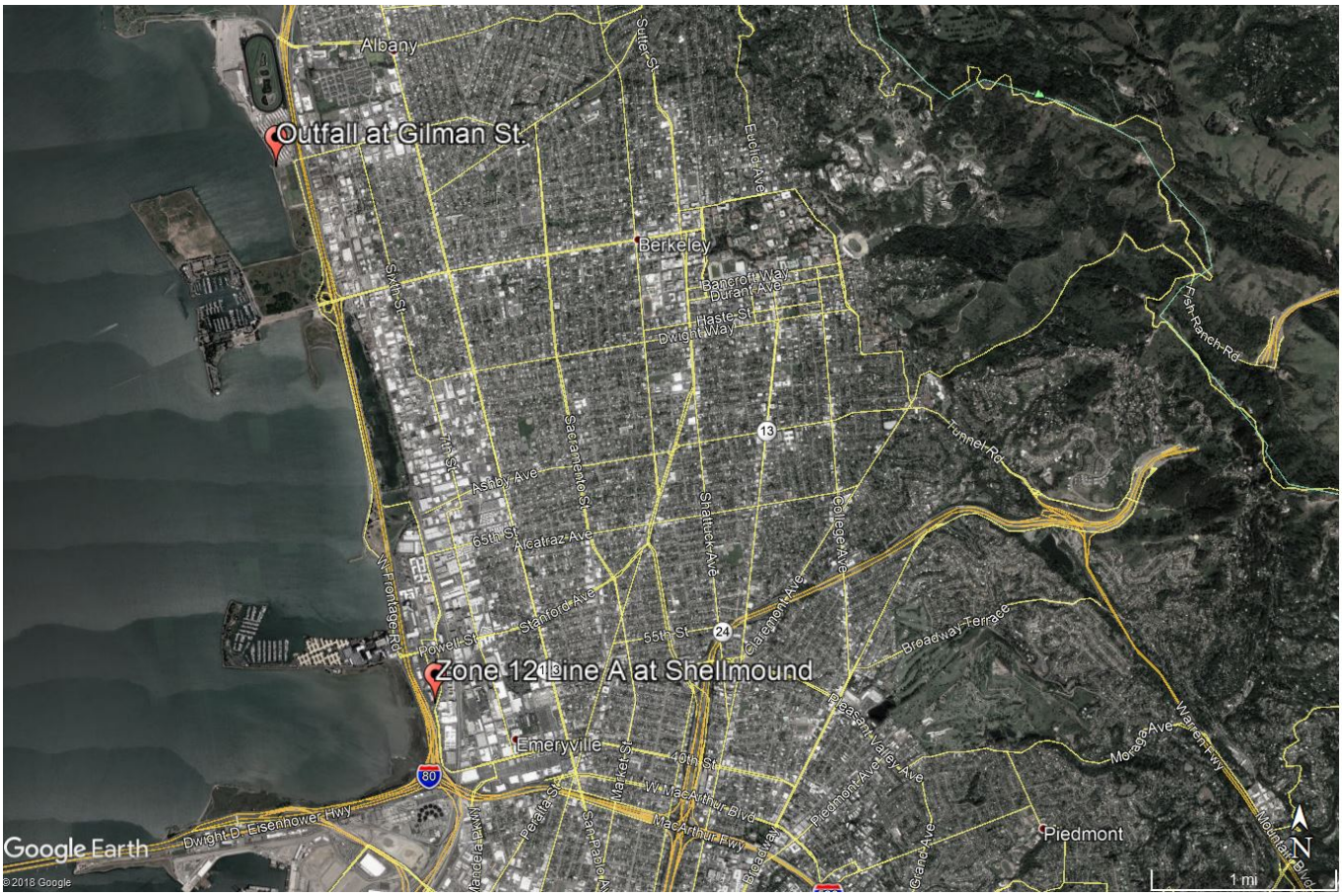

Figure 2-4. WY 2018 POC Sampling Sites by the RMP

2.1 Summary of Alameda County POC Monitoring by Parameter and Monitoring Type

Table 2-2 summarizes ACCWP's POC monitoring samples collected in WY 2018. Table 2-3 lists the minimum sampling effort required by MRP Table 8.2 for each monitoring type that must be collected by the end of year four of the permit (i.e., WY 2019) and lists the cumulative number of samples that have been collected for each monitoring type since October 1, 2016.

The MRP requirement to conduct or cause to be conducted a special study that addresses relevant management information needs for emerging contaminants has been addressed by the RMP special study on alternative flame retardants. The project report was finalized in September 2018 (Lin and Sutton, 2018).

Table 2-2. Summary of ACCWP POC monitoring samples collected in WY 2018.

POC	Number of Samples in WY 2018					Total Samples Collected in WY 2018	Minimum Number of Samples Required by MRP per Year
	Type 1	Type 2	Type 3	Type 4	Type 5		
PCBs	29	1	14	1	3	47	8
Total Mercury	24	1	9	1	6	36	8
Copper	0	0	0	12	14	11	2
Nutrients	0	0	0	5	5	5	2
Ancillary Parameters	0	0	0	0	0	28	N/A

Notes:

N/A – no minimum number of samples is required.

Table 2-3. Summary of ACCWP POC monitoring samples collected from WY 2016 – WY2018 and number required by MRP.

POC	Cumulative No. Samples WY 2016 – WY 2018					Minimum No. Samples Required by MRP Year 4					Total No. of Samples Collected WY 2016 – WY 2018	Total No. of Samples Required by MRP
	Type 1	Type 2	Type 3	Type 4	Type 5	Type 1	Type 2	Type 3	Type 4	Type 5		
PCBs	59	13	14	11	11	8	8	8	8	8	81	80
Total Mercury	54	11	9	11	11	8	8	8	8	8	70	80
Copper	0	0	0	21	21	N/A	N/A	N/A	4	4	27	20
Nutrients	0	0	0	11	11	N/A	N/A	N/A	20	N/A	9	20
Ancillary Parameters	108					N/A	N/A	N/A	N/A	N/A	52	N/A

Notes:

N/A – no minimum or total number of samples is required.

3 Planned POC Monitoring in WY 2019

As shown in Table 2-3, the MRP requirement for minimum number of samples has been met as of WY 2018 for all parameters except mercury and nutrients; 10 additional samples are needed for mercury and 11 additional samples are needed for nutrients. These samples will be collected in WY 2019.

Ongoing POC monitoring conducted by ACCWP will continue to focus on identifying PCB source properties in WY 2019. The number of samples and the sampling locations will be decided based on an analysis of the monitoring results for WY 2018, which are expected in December 2018. If possible, additional interest area sampling may be conducted in the City of Alameda, primarily in the Alameda Point redevelopment area to be converted from the former Naval Air Station.

RMP sampling in Alameda County planned for WY 2019 includes additional monitoring in the Emeryville Crescent and San Leandro Bay watersheds as part of the ongoing PMU studies, as well as two reconnaissance monitoring locations.

Additional samples may also be collected by the ACCWP in response to RMP or SPoT monitoring results, which will be available later in WY 2019.

4 References

ACCWP, 2018. Pollutants of Concern Monitoring 2017 Sediment Sampling Report: Appendix A.3A to the Urban Creeks Monitoring Report for October 2016 through September 2017. March 31, 2018.

BASMAA, 2018. Evaluation of PCBs in Caulk and Sealants in Public Roadway and Storm Drain Infrastructure Project Report. Prepared for BASMAA by EOA, SFEI, and Kinnetic Laboratories, Inc. August 16, 2018.

Lin, Diana and Rebecca Sutton. Alternative Flame Retardants in San Francisco Bay: Synthesis and Strategy. San Francisco Estuary Institute Contribution No. 885. September 2018.

Phillips, B.M., Anderson, B.S., Siegler, K., Voorhees, J., Tadesse, D., Webber, L. and R. Breuer, 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. Available at www.waterboards.ca.gov/water_issues/programs/swamp/spot/.

Phillips, B.M., Anderson, B.S., Siegler, K., Voorhees, J.P., Tadesse, D., Weber, L., Breuer, R. 2016. Spatial and Temporal Trends in Toxicity and Chemical Contamination 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. Available at www.waterboards.ca.gov/water_issues/programs/swamp/spot/.