Contra Costa Clean Water Program

Pollutants of Concern Monitoring Report: Accomplishments in Water Year 2020 and Allocation of Effort for Water Year 2021

Submitted to the San Francisco Bay Regional Water Quality Control Board

In Compliance with NPDES Permit Provision C.8.h.iv
Municipal Regional Stormwater Permit (Order R2-2015-0049)
And as Revised by Amendment Order No. R2-2019-0004

October 2020

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Municipal Regional Stormwater Permit 2.0 (Order R2-2015-0049)
and the Central Valley Regional Water Quality Control Board

Prepared for

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- Contra Costa County
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Acronyms and Abbreviations

BASMAA	Bay Area Stormwater Management Agencies Association
Bay	San Francisco Bay
Bay Area	San Francisco Bay Area
BMP	best management practice
CCCWP	Contra Costa Clean Water Program
CV	Central Valley
Delta	Sacramento-San Joaquin River Delta
EPA	United States Environmental Protection Agency
GI	green infrastructure
LID	low impact development
MeHg	methylmercury
MPC	Monitoring and Pollutants of Concern
MRP	municipal regional stormwater permit
MS4	municipal separate storm sewer system
NPDES	National Pollutant Discharge Elimination System
PCBs	polychlorinated biphenyl congeners
POC	pollutants of concern
PSD	particle size distribution
RAA	reasonable assurance analysis
RMP	Regional Monitoring Program for Water Quality in San Francisco Bay
RWQCB	Regional Water Quality Control Board
SSC	suspended sediment concentration
SWRCB	State Water Resources Control Board
TMDL	total maximum daily load
TOC	total organic carbon
WWTP	wastewater treatment plant
WY	water year

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1 BACKGROUND

This report summarizes pollutants of concern (POC) monitoring conducted by Contra Costa Clean Water Program (CCCWP) during water year 2020 (October 1, 2019 through September 30, 2020), and describes POC monitoring to be completed in the coming water year (October 1, 2020 through September 30, 2021). This report fulfills Provision C.8.h.iv of the Municipal Regional Stormwater Permit (MRP 2.0, Order R2-2015-0049) issued in 2015 by the San Francisco Bay Regional Water Quality Control Board (SFRWQCB, 2015). The following subsections describe monitoring goals (Section 1.1), CCCWP's dual jurisdiction between the San Francisco Bay and the Central Valley regional water quality control boards (Section 1.2), and concludes with lessons learned from the past several years of permit implementation (Section 1.3). Section 2 describes monitoring completed in water year 2020, and Section 3 describes monitoring to be completed in water year 2021. The report concludes with Section 4, a summary of monitoring performed by third parties reported elsewhere.

1.1 Monitoring Goals

CCCWP Permittees prioritize monitoring POCs with the goal of identifying reasonable and foreseeable means of achieving load reductions of pollutants required by total maximum daily loads (TMDLs). TMDLs are watershed plans to attain water quality goals developed and established by the San Francisco Bay Regional Water Quality Control Board (SFRWQCB). The two most prominent TMDLs in driving stormwater monitoring, source control, and treatment projects under MRP 2.0 are the mercury TMDL and the polychlorinated biphenyl congeners (PCBs) TMDL. In the interest of protecting the beneficial uses of the surface waters for people and wildlife dependent on San Francisco Bay (the Bay) for food, these regulatory plans are intended to reduce concentrations of mercury and PCBs in fish within the Bay.

Mercury and PCBs tend to bind to sediments. The principal means of transport from watersheds is via sediments washed into the Municipal Separate Storm Sewer System (MS4); therefore, an important focus of POC monitoring is identifying the most significant sources of contaminated sediments to the MS4. An additional focus is quantifying the effectiveness of control measures. The highest POC monitoring priorities for Permittees are answering these two basic TMDL implementation questions: where are the most significant POC sources, and what can be done to control them?

The SFBRWQCB framed those two priority management information needs, along with three others, in the MRP as follows:

1. ***Source Identification*** Identify which sources or watershed source areas provide the greatest opportunities for reductions of POCs in urban stormwater runoff.

2.	***Contributions to Bay Impairment***	Identify 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***	Provide support for planning future management actions or evaluating the effectiveness or impacts of existing management actions.
4.	***Loads and Status***	Provide information on POC loads, concentrations, and presence in local tributaries or urban stormwater discharges.
5.	***Trends***	Evaluate trends in POC loading to San Francisco Bay and POC concentrations in urban stormwater discharges or local tributaries over time.

Provision C.8.f of the MRP does not specify monitoring details; rather, it requires a total number of samples for different pollutant types to be monitored over the permit term, along with yearly minimum numbers of samples for each POC. The effort is to be applied to the five management information needs listed above.

The MRP requires all stormwater programs to collectively reduce PCBs from stormwater by 3 kg per year. This makes management information needs 1 (sources) and 3 (effectiveness) the highest priorities for Permittees to maintain compliance. Part of management information need 2 (watershed areas which contribute most to impairment) is also directly related to achieving load reductions. In order to prioritize management actions, Permittees need to know which specific watersheds or sub-catchments are the greatest density of source areas or average sediment pollutant concentrations.

Other aspects of the five management information needs are not as much directly related to complying with the PCB load reduction requirement of 3 kg per year by 2020. Knowing which areas of the Bay are most sensitive (second part of management information need 2) is interesting from a planning perspective, but nothing in the language of the MRP indicates extra credit would be given for reducing loads to sensitive areas. Likewise, long-term trends of POC concentrations in urban stormwater may be interesting to follow, but short-term actions are a higher priority to comply with the numeric requirements of this permit and to make progress toward improving long-term trends. For this reason, the sensitive areas aspect of management information need 2 and the trends analysis in management information need 5 is mostly addressed by funding pilot and special studies implemented by the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP).

Thinking more broadly about management questions helps address multiple questions with the same effort. For example, by identifying specific source areas through management information need 1, the concept emerged that old industrial areas contribute relatively greater amounts of PCBs per unit area. That information is responsive to management information need 2 (areas which contribute the most to

impairment). Over time, source area information is aggregated into load estimates, which inform management information need 4 (loads and status). As progress is made on abating source areas and implementing green infrastructure projects, load reduction information is developed responsive to management information need 5 (trends). The loads and status aspect (management information need 4) involves watershed modeling using monitoring data to estimate current loads of POCs and potential long-term load reductions which may be achieved through source control and stormwater treatment. This addresses long-term planning to understand how implementation of stormwater treatment through green infrastructure[1], source property referrals leading to abatement, enhanced O&M, and other control measures lead to attainment of POC load reduction goals.

CCCWP is developing a model to forecast attainment of load reduction goals for a reasonable assurance analysis (RAA) in fulfillment of Provisions C.11.d.i and C.12.d.i. An RAA establishes the relationship between areal extent of green infrastructure implementation and POC reductions, estimates the amount and characteristics of land area to be treated through green infrastructure in future years, and estimates the amount of POC reductions which will result from green infrastructure implementation by specific future years.

Permittees are developing green infrastructure plans as required by Provision C.3.j. The plans will describe how Permittees will shift their impervious surfaces and storm drain infrastructure from gray, or traditional storm drain infrastructure where runoff flows directly into the storm drain and then into the receiving water, to green – a more resilient, sustainable system that slows runoff by dispersing it to vegetated areas, harvests and uses runoff, promotes infiltration and evapotranspiration, and uses bioretention and other green infrastructure practices to clean stormwater runoff. The RAA will be performed on each Permittee's green infrastructure plan to quantify the expected volume and pollutant load reductions resulting from plan implementation.

In addition to sediment-associated TMDL pollutants, such as mercury and PCBs, Provision C.8.f also requires monitoring of copper, nutrients, and emerging contaminants (the alternative flame retardants perfluorooctane sulfonates and perfluoroalkyl sulfonates). Copper and nutrients are directly monitored by CCCWP as described in Sections 2 and 3 below. Emerging contaminants are assessed through a regional collaboration with the Bay Area Stormwater Management Agencies Association (BASMAA) and the RMP and, therefore, are not discussed at length in this report.

To summarize, of the five monitoring goals – source identification, contribution to impairment, effectiveness assessment, loads and status, and trends – the most urgent compliance-driven priorities for CCCWP Permittees are source identification and effectiveness assessment for mercury and PCBs. Analysis and modeling to forecast long-term trends will commence through the RAA. Assessments of

[1] American Rivers defines "green infrastructure" as an approach to water management which protects, restores, or mimics the natural water cycle. Green infrastructure is effective, economical, and enhances community safety and quality of life. It means planting trees and restoring wetlands, rather than building a costly new water treatment plant. Practically, in terms of stormwater management in Contra Costa County, this means requiring all new development and redevelopment projects include stormwater treatment via approved low impact development (LID) designs. These include rain gardens, bioswales, infiltration galleries, etc.

long-term trends and contribution to impairment are regional projects performed in collaboration with BASMAA and the RMP.

1.2 Dual Regional Water Quality Control Board Jurisdictions

CCCWP is in a unique position among Bay Area stormwater programs, as the county is split between the jurisdiction of the San Francisco Bay and Central Valley Regional Water Quality Control Boards (SFRWQCB and CVRWQCB, respectively). In addition to meeting monitoring requirements in the MRP, CCCWP is also required to meet monitoring specifications established in the East Contra Costa County National Pollution Discharge Elimination System (NPDES) permit (CVRWQCB, 2010) and the 2019 amendment revising the MRP (SFRWQCB, 2019) . Monitoring responsive to both permits was coordinated successfully to efficiently achieve required goals. Since the Central Valley Region has been moving toward a regional permit for municipal stormwater, CCCWP requested SFRWQCB and CVRWQCB to consolidate all areas of the county under the MRP administered by the SFBRWQCB. CCCWP will continue to be responsive to monitoring requirements established by TMDLs in the Central Valley Region which affect the East County Permittees. The summary of monitoring completed (Section 2) make note, where appropriate, of monitoring information addressing methylmercury in addition to requirements of the MRP.

1.3 Lessons Learned from MRP 1.0 (Order R2-2009-0074) and Water Years 2016-2020

At the advent of MRP 1.0 in 2009 (SFRWQCB, 2009), CCCWP and other BASMAA member agencies had some working knowledge of the distribution of PCBs and mercury loads across the urban landscape. Monitoring studies conducted in the 2000-2002 time frame showed concentrations of PCBs are highest in older industrial areas where PCBs were previously used and released. Mercury is somewhat more evenly distributed across urban land use types (through aerial deposition), with exceptions where known legacy mining sources (e.g., New Almaden) exist upstream. Still, mercury concentrations also tend to be higher in older industrial urban areas, where industrial uses and disposal of mercury occurred in the past. In some places, these early assessments turned up evidence that PCBs in sediments collected from catch basins, curbs and gutters may be elevated because of release from nearby contaminated properties. Follow-up assessments solidified the evidence of specific source properties in the City of Richmond (within Contra Costa County). Other programs had similar findings of specific source properties. Along with other information, the early studies performed by CCCWP and other BASMAA member agencies were used to develop the mercury and PCBs TMDLs for the Bay.

Source identification work conducted during MRP 1.0 confirmed two private properties in the City of Richmond with consistently high concentrations of PCBs in sediments collected from adjacent curbs, gutters and catch basins. One of the properties is a metal recycler who previously accepted and recycled used transformers; the other property was a forklift repair shop where hydraulic oil is prevalent[2]. Both

[2] Transformer oil and hydraulic oil are known historic products containing PCBs.

properties were referred to the SFRWQCB for remediation and are discussed in the 2014 integrated monitoring report (CCCWP, 2014).

The metals recycler is an active business regulated under the Industrial General Permit (SWRCB, 2015). As a result of CCCWP's source property screening and referral process under MRP 1.0, the property owner is now prohibited from discharging stormwater into the municipal storm sewer system and has designed an on-site stormwater treatment system. Oversight by the City of Richmond and the SFRWQCB compelled the property owner to implement enhanced operations and maintenance control measures, such as containing stormwater on-site, installing rumble strips to remove dirt from truck tires prior to leaving the site, and conducting enhanced street sweeping with vacuum sweepers. As a follow-up investigation, CCCWP conducted stormwater monitoring in water year 2018 in the public right-of-way. The results help determine that this property is still tracking sediments contaminated with PCBs into the MS4 system. This property was re-referred to the SFRWQCB for enforcement in the annual report for FY 2017-18. The lesson learned from this property is that follow-up sampling is useful to ensure source control measures are mitigating pollutants as expected, especially at active businesses. By mitigating releases from this property, the distribution of pollutants by way of runoff, trackout, and windborne dispersion onto surrounding streets is expected to be diminished over time.

Wide-ranging source identification activities produced another new source property for referral to the SFBRWQCB in the City of Richmond. The property is adjacent to a 2015 sampling location containing sediment PCB levels above 1.0 mg/kg and is located in San Pablo. The 10-acre property is a dormant remediation site, between the railroad tracks on Chesley Avenue. With the assistance of the SFBRWQCB, Permittees and property owners will implement actions to abate sediment discharge from this parcel to adjacent streets, the MS4, and directly to Wildcat Creek via a bypass drainage, and PCB loads will be further reduced. By mitigating this parcel, in addition to the City of San Pablo's redevelopment/abatement of the 4.45-acre former BNSF railyard site to the north, the distribution of PCB loading in this target source area is expected to diminish over time. A data gap remaining in this area is whether the railroad parcels in the area contribute PCBs to the surrounding loads.

Other than some old clean-up properties draining directly to the Bay, there are very few additional large sites which may offer high opportunity for source control. Rather, when screening is complete, CCCWP Permittees would need to wait for high likelihood parcels to change ownership or offer other opportunity for redevelopment in order to gain modest load reductions. This kind of follow-up – to address the gap between cleanup levels directed by Department of Toxic Substances Control and PCB target levels driven by TMDLs – will be a continuous, adaptive process to gradually reduce the distribution of contaminated sediments around legacy cleanup sites and old industrial areas.

One important lesson learned about monitoring low impact development (LID) facilities is that more effort needs to be directed toward quantifying exfiltration into the underlying soils (i.e., infiltration). Much of the LID monitoring in MRP 1.0 focused on comparing pollutant concentrations in stormwater flowing into a bioretention facility to concentrations in treated water flowing out of the facility

underdrain. This influent-effluent monitoring focus overlooked the benefit of infiltration, which essentially provides 100 percent pollutant load reduction for flows not exceeding the facility's infiltration capacity. Monitoring during water year 2017 included water level logging using piezometers deployed across LID facilities at a number of locations throughout the County to better characterize the range of infiltration rates typically achieved. These data will help improve our ability to predict the load reduction benefits of existing and future LID facilities, pursuant to management information needs 3 and 5.

Information about actual and assumed infiltration rates was included in CCCWP's hydromodification technical report (CCCWP, 2017). The technical report was provided to SFRWQCB staff for their consideration, with the goal of supporting reasonable sizing factors for facilities to attain hydromodification management criteria. An added benefit of the information is that modeling of green infrastructure can be based on measured instead of assumed infiltration rates. The CCCWP RAA modeling methodology for quantifying the pollutant loads reduced by green infrastructure projects incorporates these findings.

CCCWP monitored the Marsh Creek watershed for mercury and methylmercury, with an interest in understanding whether stormwater discharges from the historic Mount Diablo mercury mine in the upper watershed reach the Sacramento-San Joaquin River Delta (Delta) and San Francisco Bay. This activity is responsive to management information needs 1, 2, 4 and 5. A lesson learned during MRP 1.0 was that high frequency monitoring biased results toward smaller storms, while upper watershed flow is trapped behind the Marsh Creek Reservoir. Marsh Creek monitoring was amended to focus on large storms. The first storms in many years large enough to convey upper watershed flow to lower Marsh Creek occurred in water year 2017 and were successfully sampled. This monitoring also supported information needed for the methylmercury control study required by the Delta Methylmercury TMDL.

2 MONITORING ACCOMPLISHED IN WATER YEAR 2020

During water year 2020, monitoring activities were performed with respect to goals established at the conclusion of the previous water year, as outlined in the POCs monitoring report for water year 2019 (CCCWP, 2019). For each activity, the associated management information need is identified from among the following:

1. Source identification
2. Contributions to Bay impairment
3. Management action effectiveness
4. Loads and status
5. Trends

Monitoring activities in water year 2020 are summarized below and discussed in greater detail in the following subsections:

- PCBs and mercury screening - street dirt and storm drain drop inlet sampling at six locations adjacent to suspected source properties in old industrial areas of Santa Fe Channel watershed, Herman Slough watershed, Martinez Creek watershed and/or Kirker Creek watershed (management information needs 1, 2 and 3).

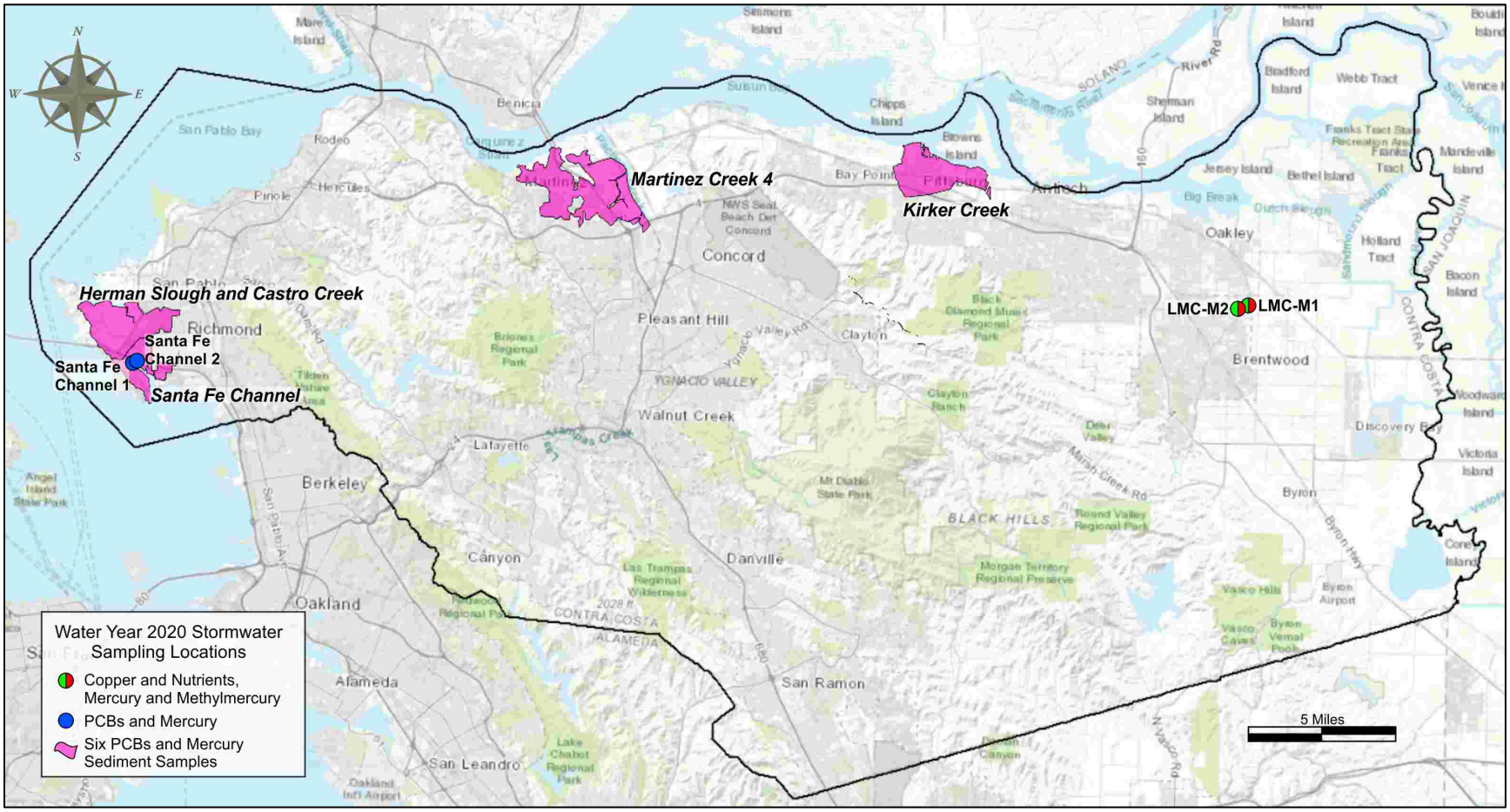
- PCBs and mercury screening – stormwater reconnaissance sampling by the RMP at two locations in the Santa Fe Channel watershed. (management information needs 1, 2, 4 and 5).

- Copper and nutrients water sampling in lower Marsh Creek (management information needs 1, 2, 4 and 5).

- Mercury and methylmercury water sampling in lower Marsh Creek (management information needs 1, 2, 4 and 5, specific to East County Permittees).

Refer to Figure 1 for the location of each monitoring activity.

Figure 1. Location of WY 2020 Monitoring Activities – County Overview



2.1 PCBs and Mercury Screening - Street Dirt and Storm Drain Drop Inlet Sampling in Old Industrial Areas of Richmond, Martinez, and/or Pittsburg

Six composite samples of street dirt and/or storm drain drop inlet sediment in the public right of way is scheduled for collection in September 2020. Sampling sites will be selected from a GIS layer that was prepared by CCCWP's C.11/C.12 contractor, Geosyntec Consultants, that identifies remaining old industrial properties throughout the county that may not have been thoroughly investigated in the past, and that may have the potential to contribute PCBs to the public right of way and the MS4. In generating the property database, careful consideration was given to the historic land use of each property and to results of previous monitoring efforts.

Refer to Table 1 for test methods and reporting limits. Results from water year 2020 monitoring are not yet available.

Table 1. Sediment Screening Analytical Tests, Methods, Reporting Limits, and Holding Times

Sediment Analytical Test	Method	Target Reporting Limit	Holding Time
Total PCBs (RMP 40 congeners)[1]	EPA 8082A	0.5 µg/kg	1 year
Total Mercury	EPA 7471B	5 µg/kg	1 year
Total Organic Carbon	ASTM D4129-05M	0.05%	28 days
Particle Size Distribution[2]	ASTM D422M	0.01%	28 days

1 San Francisco Bay RMP 40 PCB congeners include PCB-8, 18, 28, 31, 33, 44, 49, 52, 56, 60, 66, 70, 74, 87, 95, 97, 99, 101, 105, 110, 118, 128, 132, 138, 141, 149, 151, 153, 156, 158, 170, 174, 177, 180, 183, 187, 194, 195, 201, and 203.

2 Particle size distribution by the Wentworth scale; percent fines (slit and clay) are less than 62.5 microns.

2.2 RMP Reconnaissance Stormwater Sampling for PCBs and Mercury

MRP Provision C.8.f. requires Permittees to assess inputs of POCs to the Bay from local tributaries and urban runoff, provide information to support implementation of TMDLs and other pollutant control strategies, assess progress toward achieving waste load allocations for TMDLs, and help resolve uncertainties associated with loading estimates and impairments associated with these pollutants. In particular, monitoring required by this provision must be directed toward addressing the five priority POC management information needs. In support of these information needs, the RMP continued to perform reconnaissance monitoring for PCBs and mercury in water year 2020.

Reconnaissance monitoring by the RMP was conducted to identify drainages with potentially elevated concentrations of PCBs and/or mercury. The intention of reconnaissance monitoring by the RMP is to guide upstream source investigations. With input from CCCWP, locations were selected to provide coverage in areas where data gaps existed. The RMP monitored two sites in Contra Costa County in water year 2020. The two sites were located in the City of Richmond at storm drain outfalls that directly discharge to the north end of Santa Fe Channel in Richmond Harbor.

Refer to Table 2 for test methods and reporting limits. Results from water year 2020 monitoring are not yet available.

Table 2. Stormwater Analytical Tests, Methods, Reporting Limits, and Holding Times

Sediment Analytical Test	Method	Target Reporting Limit	Holding Time
Total PCBs (RMP 40 congeners)[1]	EPA 1668C	0.1 µg/kg	1 year
Total Mercury	EPA 1631E	0.5 ng/L	90 days
Suspended Sediment Concentration	ASTM D 3977-97	1.5 mg/L	7 days
Total Organic Carbon	EPA 9060	0.50 mg/L	28 days

1 San Francisco Bay RMP 40 PCB congeners include PCB-8, 18, 28, 31, 33, 44, 49, 52, 56, 60, 66, 70, 74, 87, 95, 97, 99, 101, 105, 110, 118, 128, 132, 138, 141, 149, 151, 153, 156, 158, 170, 174, 177, 180, 183, 187, 194, 195, 201, and 203.

2 Particle size distribution by the Wentworth scale; percent fines (slit and clay) are less than 62.5 microns.

2.3 Copper and Nutrients Monitoring

Sampling for copper and nutrients was conducted in lower Marsh Creek during dry weather at Station M1, located immediately downstream of the Brentwood WWTP outfall. Two samples were collected; the first was collected early in the morning on August 26 at the approximate stage minimum for the day, the second was collected in the late morning on August 27 at the approximate stage maximum for the day. The early morning stage minimum occurred before the WWTP began its daily discharge, and the late morning stage maximum occurred when the WWTP was at or near its maximum daily outflow. This paired sampling strategy helps to identify variations in dry weather water quality that may exist in lower Marsh Creek where WWTP outflow is a major source of flow to the creek.

Samples were filtered in the field within 15 minutes of collection for dissolved copper, ammonia, nitrate, nitrite, and orthophosphate. Refer to Table 3 for test methods and reporting limits. Results from water year 2020 monitoring are not yet available.

Table 3. Copper and Nutrients in Water - Analytical Tests, Methods and Reporting Limits

Analytical Test	Method	Target Reporting Limit
Suspended Sediment Concentration (SSC)	ASTM D 3977-97B	3 mg/L
Copper, total recoverable and dissolved	EPA 200.8	0.5 µg/L
Hardness	SM 2340C (titration)	5 mg/L
Ammonia as N	SM 4500-NH3 C v20	0.1 mg/L
Nitrate	EPA 300.0	0.05 mg/L
Nitrite	EPA 300.0	0.05 mg/L
Total Kjeldahl Nitrogen	SM 4500 NH3-C	0.1 mg/L
Dissolved Orthophosphate	SM 4500P-E	0.01 mg/L
Total Phosphorus	SM 4500P-E	0.01 mg/L

2.4 Mercury and Methylmercury Water Sampling in Lower Marsh Creek – Central Valley Requirement

Mercury and methylmercury sampling was conducted concurrent with copper and nutrient sampling on Marsh Creek during dry weather. This work builds on results of the Methylmercury Control Study Final Report (CCCWP, 2018), and should help to better understand mercury concentrations and methylation occurrences within lower Marsh Creek. Samples were collected during Brentwood WWTP outflow minimum (early morning) and outflow maximum (late morning) at Station M1 and at an upstream control location, Station M2. Samples at Station M1 were collected in triplicate for variability assessment between morning and evening averages.

This monitoring effort satisfies Central Valley requirements of the newly promulgated MRP Amendment Provision C.16.5.g for eight samples within lower Marsh Creek each year (SFRWQCB, 2019). Refer to Table 4 for test methods and reporting limits. Results from water year 2020 monitoring are not yet available.

Table 4. Mercury and Methylmercury in Water - Analytical Tests, Methods, Reporting Limits, and Holding Times

Sediment Analytical Test	Method	Target Reporting Limit	Holding Time
Total Mercury	EPA 1631E	0.5 ng/L	90 days
Total Methylmercury	EPA 1631	0.05 ng/L	90 days
Suspended Sediment Concentration	ASTM D 3977-97	1.5 mg/L	7 days

2.5 Summary of Monitoring Completed in Water Year 2020

Water year 2020 monitoring is summarized in Tables 5 and 6. The tables list the total number of tests completed for each pollutant class and analyte, the corresponding management information needs addressed, and the target number of tests outlined in the MRP. The tables also identify monitoring completed by third parties used to help CCCWP meet the numeric monitoring targets identified in the MRP. Third-party monitoring completed in water year 2020 is discussed in Section 4.

The number of samples collected and analyzed in water year 2020 met the minimum annual requirements of the MRP in all pollutant categories. The cumulative number of samples during water years 2016 through 2020 met the requirements of the MRP 5-year term.

The complete results of water year 2020 monitoring will be reported in an appendix to the Urban Creeks Report due on March 31, 2021, and will help inform water year 2021 sampling efforts.

Table 5. Summary of Monitoring Completed in WY 2020 by Pollutant Class, Analyte, Management Information Need, and MRP Targets

Pollutant Class / Type of Monitoring	Analyte									Management Information Need					Agency or Organization Performing the Monitoring	Number of Samples Collected and Analyzed in WY 2020	Cumulative Number of Samples Collected and Analyzed In WYs 2016 through 2020	Total Number of Samples Required By the MRP for 5-Year Term
	PCBs	Mercury	Methylmercury	SSC	PSD	TOC	Copper [1]	Hardness	Nutrients [2]	Source ID	Bay Impairment	Management Action	Loads & Status	Trends				
PCBs - water	✓			✓		✓				X	X		X	X	RMP	2[a]	93	80
PCBs - sediment	✓				✓	✓				X	X	X			CCCWP	6[b]		
Mercury & MeHg - water		✓	✓	✓						X	X	X	X	X	CCCWP	8[c]	137	80
Mercury - water		✓		✓						X	X		X	X	RMP	2[a]		
Mercury - sediment		✓			✓					X	X	X			CCCWP	6[b]		
Copper - water							✓	✓		X	X		X	X	CCCWP	2	20	20
Nutrients - water									✓	X	X		X	X	CCCWP	2	20	20

1 Total and dissolved fractions of copper

2 Nutrients include: ammonia, nitrate, nitrite, total Kjeldahl nitrogen, orthophosphate and total phosphorus

a The RMP collected stormwater samples at Santa Fe Channel Outfall 1 and Santa Fe Channel Outfall 2

b Sediment screening adjacent to remaining old industrial source properties in high opportunity watershed of Santa Fe Channel, Herman Slough, Martinez Creek, and/or Kirker Creek

c Mercury and methylmercury co-sampled with copper and nutrients on Marsh Creek

SSC suspended sediment concentration
PSD particle size distribution
TOC total organic carbon
MeHg total methylmercury

Table 6. Summary of Monitoring Completed in WYs 2016 through 2020 toward MRP Targets

Pollutant Class by Water Year		Number of Samples Collected and Analyzed per Management Information Need					Annual Number of Samples Collected and Analyzed	
		Type 1: Source ID	Type 2: Bay Impairment	Type 3: Management Action	Type 4: Loads & Status	Type 5: Trends	Actual	Required by MRP
2016	PCBs	28	28	14	6	6	28	8
	Mercury	37	37	32	15	15	46	8
	Copper[1]	0	0	0	0	0	0	2
	Nutrients	0	0	0	0	0	0	2
2017	PCBs	27	27	27	14	14	27	8
	Mercury	26	26	18	18	18	26	8
	Copper[1]	4	4	0	4	4	4	2
	Nutrients	4	4	0	4	4	4	2
2018	PCBs	16	11	13	9	9	22	8
	Mercury	25	25	27	17	17	31	8
	Copper[1]	2	2	0	2	2	2	2
	Nutrients	2	2	0	2	2	2	2
2019	PCBs	8	8	4	6	4	8	8
	Mercury	16	16	12	14	12	16	8
	Copper[1]	12	12	0	12	12	12	2
	Nutrients	12	12	0	12	12	12	2
2020	PCBs	8	8	6	2	2	8	8
	Mercury	16	16	14	10	10	16	8
	Copper[1]	2	2	0	2	2	2	2
	Nutrients	2	2	0	2	2	2	2
WY 2016 – 2020 Totals / Required Number by end of WY 2020							**WY 2016 – 2020 Totals**	**Requirement for 5-Year Permit Term**
PCBs		79 / 8	74 / 8	60 / 8	31 / 8	31 / 8	93	80
Mercury		106 / 8	106 / 8	93 / 8	62 / 8	62 / 8	137	80
Copper[1]		20 / NA	20 / NA	0 / NA	20 /4	20 / 4	20	20
Nutrients		20 / NA	20 / NA	0 / NA	20 / 20	20 / NA	20	20

1 Total and dissolved fractions of copper
NA = Not applicable; there is no permit requirement

3 MONITORING PLAN FOR WATER YEAR 2021

Monitoring in water year 2021 is expected to continue with a similar level of effort as the first five years of the permit term, and is expected to include the following activities:

1. Sediment investigation of remaining old industrial source areas countywide, including street dirt and drop inlet sediment sampling in the public right of way adjacent to high-opportunity properties
2. Watershed characterization monitoring for copper and nutrients
3. Methylmercury monitoring in Marsh Creek
4. Stormwater monitoring for PCBs and mercury in the Santa Fe Channel watershed; performed by the RMP
5. Infiltration monitoring to support planned green stormwater infrastructure GI projects located in Walnut Creek and San Pablo

The following subsections provide background information on monitoring goals and descriptions of planned activities, as well as overall numeric goals (number of samples to be collected) during water year 2021.

3.1 Sediment Investigation of Remaining Old Industrial Source Areas

Sediment investigation of remaining old industrial source areas countywide for PCBs and mercury will take place at locations identified through ongoing desktop research and field surveys. Sites which may be added to the sampling list include locations of interest due to historic or present-day land use, lack of adequate source control by property owners, reoccurring accumulation of sediment, etc.

Based on lessons learned during water years 2015-2020, it is apparent that high opportunity areas for PCBs and mercury controls do not always co-locate with known or suspected contaminated source properties. High concentrations of PCBs do not always occur where expected and, in some cases, are found in relatively high concentrations in areas of only moderate interest. For this reason, monitoring efforts may be expanded to include larger geographical regions around locations of interest to investigate for the presence of PCBs in areas which might have otherwise been overlooked.

Six sediment screening samples will be collected in water year 2021.

3.2 Watershed Characterization for Copper and Nutrients

Sampling for copper and nutrients in water year 2021 is planned for lower Marsh Creek and/or its tributaries. The determination of nutrient concentrations in Marsh Creek may help to determine if elevated levels are present that might promote the growth of aquatic vegetation observed during late spring and summer in lower Marsh Creek.

Two samples for copper and nutrients will be collected in water year 2021.

3.3 Methylmercury Monitoring in Marsh Creek

Mercury and methylmercury monitoring in Marsh Creek (and its tributaries) will be used to further CCCWP's understanding of methylmercury distribution (spatially and temporally) within the Marsh Creek system. This sampling will satisfy the annual requirement of the newly promulgated MRP amendment (SFRWQCB, 2019).

A total of eight samples for mercury and methylmercury will be collected in water year 2021.

3.4 Stormwater Monitoring for PCBs and Mercury by the RMP

CCCWP participates in a Bay Area characterization study of PCBs and mercury in stormwater runoff in areas of interest. For water year 2021, two stormwater samples are targeted for collection within the Santa Fe Channel watershed at locations to be identified in a joint effort by the RMP and representatives of CCCWP.

3.5 Summary of Monitoring Planned for Water Year 2021

Based on the planned activities described in the sections above, sampling by CCCWP for water year 2021 is summarized in Table 7.

Table 7. CCCWP Monitoring Planned for WY 2021 by Pollutant Class and MRP Targets

Pollutant Class / Type of Monitoring	Management Information Need					Number of Samples Planned for WY 2021 by CCCWP (and through the RMP)	Cumulative Number of Samples Collected and Analyzed in WYs 2016 through 2020	Annual Minimum Number of Samples Required by the MRP	Total Number of Samples Required By the MRP Over 5-Year Term
	Source ID	Bay Impairment	Management Action	Loads & Status	Trends				
PCBs – water	X	X	X	X	X	2[a]	93	8	80
PCBs – sediment	X	X	X		X	6[b]			
Mercury & MeHg - water	X	X	X	X	X	8[c]	137	8	80
Mercury – water	X	X		X	X	2[a]			
Mercury - sediment	X	X	X			6[b]			
Copper[1] – water	X	X		X	X	2[d]	20	2	20
Nutrients[2] – water	X	X		X	X	2[d]	20	2	20

MeHg methylmercury
1 Total and dissolved copper
2 Ammonium, nitrate, nitrite, total Kjeldahl nitrogen, orthophosphate and total phosphorus
a Stormwater samples targeted for collection by the RMP in Contra Costa County
b Sediment screening from streets, drop inlets and/or public rights-of-way
c Mercury and methylmercury monitoring in Marsh Creek per Central Valley requirements
d Characterization monitoring in Marsh Creek

4 SUMMARY OF WATER YEAR 2020 POLLUTANT MONITORING REPORTED ELSEWHERE

This section describes monitoring activities conducted by others which were funded in part by CCCWP. In addition to directly managing monitoring programs, CCCWP participates in the RMP by direct financial contributions and participation in RMP subcommittees responsible for planning and directing monitoring projects. The RMP Sources, Pathways and Loadings Workgroup, and the associated Small Tributaries Loading Strategy subgroup, are the main points of contact between CCCWP and the RMP. CCCWP also collaborates on projects with BASMAA and supports Permittees in implementing projects at the local level.

4.1 MRP Provision C.8.f. – Pollutants of Concern Monitoring: RMP Ongoing Reconnaissance Sampling for PCBs and Mercury

MRP Provision C.8.f. requires Permittees to assess inputs of POCs to the Bay from local tributaries and urban runoff, provide information to support implementation of TMDLs and other pollutant control strategies, assess progress toward achieving waste load allocations for TMDLs, and help resolve uncertainties associated with loading estimates and impairments associated with these pollutants. In particular, monitoring required by this provision must be directed toward addressing the five priority POC management information needs. In support of these information needs, the RMP continued to perform reconnaissance monitoring for PCBs and mercury in water year 2019.

In water year 2020, the RMP performed reconnaissance monitoring to identify drainages with potentially elevated concentrations of PCBs and/or mercury. The intention of reconnaissance monitoring by the RMP is to guide upstream source investigations. With input from CCCWP, locations were selected to provide coverage in areas where data gaps existed. The RMP monitored two sites in Contra Costa County in water year 2020. The two sites were located in the City of Richmond at storm drain outfalls that directly discharge to the north end of Santa Fe Channel in Richmond Harbor.

In summary, work performed by the RMP in water year 2020 provided two stormwater samples each for mercury and PCBs which were directly responsive to management information needs 1 (sources), 2 (contributions to Bay impairment), and 4 (loads and status), and indirectly supportive of progress on management information needs 3 (effectiveness) and 5 (trends). The RMP monitoring work will be reported in a separate report as an appendix to the UCMR.

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