CONTRA COSTA CLEAN WATER PROGRAM

Integrated Monitoring Report: Water Years 2020-2025

(October 2019 – September 2025)

Submitted to the San Francisco Bay and Central Valley Regional Water Quality Control Boards in Compliance with NPDES Permit Provision C.8.h.v and C.19.d.iii.(4)

NPDES Permit No. CAS612008

March 31, 2026

A Program of Contra Costa County, its Incorporated Cities and Towns, and the Contra Costa Flood Control & Water Conservation District

Contra Costa Clean Water Program

Integrated Monitoring Report:
Water Years 2020-2025
(October 2019 – September 2025)

March 31, 2026

Prepared for

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- Cities of Antioch, Brentwood, Clayton, Concord, Danville (Town), El Cerrito, Hercules, Lafayette, Martinez, Moraga (Town), Oakley, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, and Walnut Creek
- Unincorporated Contra Costa County
- Contra Costa County Flood Control & Water Conservation District

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Table of Contents

Acronyms and Abbreviations iii
Preface iv
Executive Summary v
1 Introduction 1
1.1 Regulatory Context 1
1.2 Bay Area Municipal Stormwater Collaborative (BAMSC) Overview 2
1.3 Report Organization 3
1.4 Monitoring Costs 5
2 Compliance Options (C.8.a) 7
3 Monitoring Protocols and Data Quality (C.8.b) 8
3.1 Standard Operating and Data Quality Assurance Procedures 8
4 San Francisco Estuary Receiving Water Monitoring (C.8.c) 10
4.1 RMP Status and Trends Monitoring Program 11
4.2 RMP Pilot and Special Studies 11
4.3 Participation in Committees, Workgroups, and Strategy Teams 11
5 Low Impact Development (LID) Monitoring (C.8.d) 12
6 Trash Monitoring (C.8.e) 15
7 Pollutants of Concern Monitoring (C.8.f, C.11, C.12, and C.19.d) 17
7.1 Pollutants of Concern Monitoring Activities and Results 18
7.2 Stormwater Monitoring Strategy for Emerging Contaminants 20
8 Pesticides and Toxicity Monitoring (C.8.g) 23
8.1 Dry Weather Chemistry and Toxicity Testing, WY 2025 23
8.2 Comprehensive Analysis of Monitoring Data, WYs 2020-2025 24
8.3 Prior Conditions, Beneficial Uses, Water Quality Standards, and Impairments 25
9 East County Annual Mercury Monitoring Plan for WY 2027 (C.19.d) 27
10 References 28

Appendices

Appendix 1: Low Impact Development (LID) Monitoring Report: Water Years 2024-2025
Appendix 2: Trash Outfall Monitoring Report: Water Years 2024-2025
Appendix 3: Trash Receiving Water Monitoring Report: Water Years 2024-2025
Appendix 4: Pollutants of Concern Monitoring Report: Water Years 2020-2025
Appendix 5: Pollutants of Concern Receiving Water Limitations Assessment Report Update
Appendix 6: Fate and Transport of Mercury and PCBs
Appendix 7: Pesticides and Toxicity Monitoring Report: Water Years 2020-2025
Appendix 8: East County Annual Mercury Monitoring Plan: Water Year 2027

Attachment

Attachment A: Electronic Data Submittal Transmittal Letter dated March 31, 2026, with attached file list

List of Tables

Table 1 BAMSC Workgroup Participants ..... **Error! Bookmark not defined.**
Table 2 Annual CCCWP Monitoring Budget Summary under MRP 3.0 .... **Error! Bookmark not defined.**
Table 3 Contributions the MRP Permittees have agreed to make annually to augment the RMP's Emerging Contaminant Monitoring Strategy during the term of the permit .. **Error! Bookmark not defined.**

List of Figures

Figure 1 MRP Provision C.8 and C.19 Monitoring Sites in WYs 2020-2025 4

Acronyms and Abbreviations

ACCWP	Alameda Countywide Clean Water Program
BAMSC	Bay Area Municipal Stormwater Collaborative
BASMAA	Bay Area Stormwater Management Agencies Association
Bay	San Francisco Bay
CCCWP	Contra Costa Clean Water Program
CEC	contaminant of emerging concern
CEDEN	California Environmental Data Exchange Network
CVRWQCB	Central Valley Regional Water Quality Control Board
Delta	Sacramento-San Joaquin River Delta
LID	low impact development
MRP	Municipal Regional NPDES Stormwater Permit
MS4	municipal separate storm sewer system
NPDES	National Pollutant Discharge Elimination System
O&M	operations and maintenance
PCB	polychlorinated biphenyls
PFAS	per- and polyfluoroalkyl substances
PMU	priority margin unit
POC	pollutants of concern
P/S Studies	pilot and special studies
QAPP	quality assurance project plan
Region 2	San Francisco Bay Regional Water Quality Control Board
Region 5	Central Valley Regional Water Quality Control Board
RMP	Regional Monitoring Program for Water Quality in San Francisco Bay
RWL	receiving water limitations
RWQCB	Regional Water Quality Control Board
S&T	status and trends program
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
SPoT	Stream Pollution Trends
SSA	Solano Stormwater Alliance
SWAMP	California Surface Water Ambient Monitoring Program
TMDL	Total maximum daily load
TU	toxic unit
WY	water year

Preface

On May 11, 2022, the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) adopted the third Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit per Order No. R2-2022-0018 (MRP 3.0). This permit became effective July 1, 2022, at the start of the fourth quarter of water year (WY) 2022, superseding Order No. R2-2019-0004 (MRP 2.0 amendment).

This integrated monitoring report (IMR) and all appendices presented herein fulfill reporting requirements specified in MRP 3.0 Provision C.8.h.v and C.19.d.iii.(4). Data presented in this report were collected pursuant to Provisions C.8 and C.19 of MRP 3.0, in accordance with applicable standard operating procedures, monitoring plans, and quality assurance project plans (QAPP). Where applicable, monitoring data were derived using methods comparable to those specified by the California Surface Water Ambient Monitoring Program (SWAMP) QAPP. Data presented in this report were submitted in electronic SWAMP comparable formats in late March 2026 to Moss Landing Marine Laboratory for transmittal to the San Francisco Bay and Central Valley Regional Water Quality Control Boards on behalf of the Contra Costa Clean Water Program (CCCWP) Permittees and pursuant to the MRP 3.0 Provision C.8.h.ii requirements for electronic data reporting.

Executive Summary

This integrated monitoring report (IMR) was prepared by the Contra Costa Clean Water Program (CCCWP) to document compliance with Municipal Regional National Pollutant Discharge Elimination System (NPDES) Stormwater Permit (MRP) 3.0 Provisions C.8, C.11, C.12, and C.19.d, and to summarize water quality monitoring conducted during water years (WY) 2020–2025. MRP 3.0 Provision C.8.h.v requires Permittees to submit an IMR in lieu of the annual urban creeks monitoring report by March 31, 2026, and to report on all data collected since the previous IMR. The report integrates locally collected data and regionally coordinated monitoring to support permit compliance, evaluate the effectiveness of management actions, and inform future monitoring and program decisions. Contra Costa County spans the jurisdictions of both the San Francisco Bay and Central Valley Regional Water Quality Control Boards (SFBRWQCB and CVRWQCB, respectively), and the IMR reflects the transition to unified regulation under MRP 3.0, which became effective in July 2022 and incorporated applicable Central Valley TMDL (total maximum daily load) requirements through Provision C.19. Together, these provisions establish the regulatory framework, geographic scope, and purpose of the IMR, providing context for how monitoring results are used to protect water quality and beneficial uses while meeting state and regional regulatory requirements.

The IMR and its appendices summarize and integrate the results of monitoring data gathered directly by CCCWP monitoring contractors, as well as through regional collaborations with the Bay Area Municipal Stormwater Collaborative (BAMSC) and the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP). Monitoring data is presented in tabular, statistical, and graphical analysis to address monitoring and management questions throughout the report appendices. In addition to monitoring data gathered directly by CCCWP, some IMR elements entail regional collaboration outside typical BAMSC workgroup meetings, including: 1) regional analysis of low impact development (LID) monitoring results, 2) regional analysis of trash outfall monitoring results, 3) regional analysis of pollutants of concern (POCs) receiving water limitations (RWL) monitoring results, 4) reporting on studies of the fate and transport of mercury and polychlorinated biphenyls (PCBs) from urban runoff to San Francisco Bay (Bay) margin areas per C.11.g and C.12.i and 5) recommendation for changes to elements of Provision C.8 in future permit terms. POC monitoring, pesticides and toxicity monitoring, and East County annual mercury monitoring results are presented on a countywide level. Permit provision summaries and activities related to compliance are summarized below.

- **Provision C.8.a** allows CCCWP Permittees to meet MRP 3.0 monitoring requirements through regional collaboration, use of an area-wide stormwater program, or through use of third-party monitoring data. CCCWP joined with several other stormwater programs to participate in a regional collaborative effort to coordinate water quality monitoring. The resulting regional monitoring collaborative is called the BAMSC Regional Monitoring Coalition (RMC). The benefit of the RMC to the CCCWP Permittees is to ensure final monitoring and reporting results meet SVBRWQCB and CVRWQCB expectations for data content and quality, and to provide consistent and comparable data for the region.
- **Provision C.8.b** requires that monitoring data is collected in a manner consistent with the latest version of California Surface Water Ambient Monitoring Program (SWAMP) quality assurance project plan (QAPP) applicable parameters, including data quality objectives and the most recent SWAMP standard operating procedures. Monitoring plans and QAPPs

for MRP 3.0 monitoring have been submitted, reviewed, and approved by Regional Water Board staff.

- **Provision C.8.c** requires that CCCWP Permittees implement a San Francisco Estuary receiving water monitoring program. CCCWP complies with this provision through financial contribution to the RMP. The RMP's Status and Trends Monitoring Program and Pilot and Special Studies efforts provide data to address management questions in Provision C.8.c, as part of a long-term, discharger-funded monitoring program directed by a steering committee represented by regulatory agencies and community members.

- **Provision C.8.d** requires LID monitoring intended to measure effectiveness of LID controls. In WY 2023, CCCWP established a monitoring station at the Ohlone Greenway Rain Garden LID facility and subsequently conducted monitoring in WYs 2024 and 2025. A total of 12 successful storms were monitored in WYs 2024 and 2025, with additional monitoring planned to continue through the MRP permit term. The hydrologic, water-quality, and maintenance assessment results associated with the 12 monitored storm events are presented in Appendix 1, summarized in Section 6 of this report, and summarized very briefly in the following paragraph.

  The Ohlone Greenway bioretention facility consistently operated as designed for all 12 monitored storms, fully treating all influent runoff and providing substantial hydromodification benefits including soil storage, exfiltration to underlying native soil, attenuated peak discharge rates, and delayed/reduced discharge to the municipal separate storm sewer system (MS4). Water quality results indicate that the facility is highly effective at removing sediment-associated pollutants (including TSS, total metals, PCBs, and hydrocarbons), while dissolved metals loads were reduced through volume control, and per- and polyfluoroalkyl substances (PFAS) results indicate that conventional bioretention does not reliably remove these compounds. Routine weekly maintenance and periodic corrective actions were sufficient to sustain optimal facility performance, with no observed deterioration and no measurable relationship between time since maintenance and hydrologic or pollutant removal effectiveness.

- **Provision C.8.e** requires trash monitoring intended to 1) verify whether Permittees' trash control actions to date have effectively prevented trash from their jurisdictions from discharging to receiving waters, and 2) evaluate whether discharges of trash from areas of Permittees jurisdictions where full trash capture equivalency has been achieved are causing and/or contributing to adverse trash impacts in receiving waters. CCCWP selected two outfalls in WY 2023 for trash outfall monitoring and one receiving water monitoring location in WY 2024. Trash outfall monitoring sites are in the unincorporated community of Pacheco and in the City of Walnut Creek. The trash receiving water monitoring station is in Rodeo Creek in the unincorporated community of Rodeo.

  In WYs 2024-2025, two trash outfall sites were monitored for six storm events each (three events during each water year), including first flush, an event predicted to exceed the full trash capture device design standard (i.e., the one-year, one-hour storm event), and a third event forecast to trigger trash discharge through the MS4. At both sites, all six target storm events were sampled successfully. Results from trash outfall monitoring are presented in Appendix 2, along with annual hydrographs and annual trash loading calculations for each catchment areas. The annual trash loading for the outfall in Pacheco was determined using linear regression statistical analyses on two independent storm variables (rainfall intensity

and peak flow) that influence trash transport into the MS4. Annual trash load estimates by variable at the outfall site in Pacheco were similar in range for the two years: 1.72 to 1.32 gallons/acre/year for maximum rainfall intensity, and 3.59 to 3.20 gallons/acre/year for peak flow. Models suggest trash control actions in the Pacheco catchment area are effectively controlling trash discharge to low levels (i.e. <5 gallons/acre/year). The annual trash load estimate for the site in Walnut Creek was calculated to be <0.01 gallons/acre/year. The annual trash load estimate for the Walnut Creek catchment area is based on five out of six samples containing no trash, and one sample containing less than 0.03 ounces. This suggests the Walnut Creek catchment area is controlled to low trash discharge levels (<5 gallons/acre/year).

CCCWP selected one receiving water monitoring location (located in Rodeo Creek in the unincorporated community of Rodeo) in WY 2024. In WY 2025, CCCWP collected three samples at this location during three storm events, including the first seasonal flush and two events that exceeded the minimum desired rainfall threshold. Annual trash loading rates were calculated using a simple model that uses the mean trash concentrations for all aliquots. The mean trash concentration during stormflow was multiplied across the entire stormflow hydrograph for WY 2025 monitoring. Using this simple method, the trash loading rate for the Rodeo Creek site in Contra Costa County was 0.01 gallons/acre/year.

- **Provision C.8.f, C.11, C.12, and C.19.d** requires Permittees to conduct POC monitoring to assess inputs of select POCs to the Bay and Sacramento-San Joaquin River Delta (Delta) from local tributaries and urban runoff, provide information to assess compliance with receiving water limitations, assess progress toward achieving wasteload allocations for TMDLs, and help resolve uncertainties associated with loading estimates for these pollutants. Monitoring addressed six priority information needs—source identification, contributions to Bay impairment, management action effectiveness, loads and status, trends, and compliance with receiving water limitations—using an integrated framework that combined sediment, stormwater, surface water, and receiving water assessments. Monitoring efforts were implemented through a combination of local data collection and regional collaboration, including participation in BAMSC and the RMP to ensure data quality, comparability, and regulatory relevance.

  Results of POC monitoring indicate that PCBs and mercury remain the primary drivers of impairment, with elevated concentrations of PCBs and mercury found in old industrial areas and elevated concentrations of mercury found more broadly distributed across the county. Sediment screening and confirmatory stormwater sampling effectively identified high-opportunity source areas, supporting targeted source control actions and progress toward TMDL implementation milestones. Copper and nutrient monitoring generally met applicable water quality criteria. RWL monitoring showed consistency with expected urban creek conditions. East County methylmercury monitoring identified exceedances primarily during storm events with elevated suspended sediment and during dry weather in low-flow conditions, highlighting the influence of hydrologic conditions on mercury transport and methylation. Overall, monitoring conducted during WYs 2020–2025 met or exceeded MRP requirements and provides a strong technical foundation to guide continued source control, adaptive management, and refinements to monitoring strategies under future permit terms.

- **Provision C.8.g** requires Permittees to conduct wet and dry weather monitoring of pesticides and toxicity in urban creeks. Monitoring conducted by CCCWP during WYs 2020–2025 indicates that pesticide-related toxicity remains an ongoing concern in select urban creeks, consistent with long-standing regional and statewide findings. Monitoring included wet and dry weather water column toxicity testing, sediment toxicity testing, and chemical water quality analyses. Data collection followed SWAMP-comparable protocols and approved regional quality assurance procedures.

  Results indicate continued occurrences of both water column and sediment toxicity to aquatic organisms, particularly during wet weather events and in dry weather sediment samples. Acute and chronic toxicity to multiple test species including *Hyalella azteca*, *Ceriodaphnia dubia*, and *Selenastrum capricornutum* was observed in urban streams in Contra Costa County. Wet weather toxicity observed during WY 2023 was attributable primarily to elevated concentrations of pyrethroid pesticides, with toxic unit analyses confirming pesticide-related causes. Dry weather monitoring identified intermittent toxicity despite variable pesticide detections, likely indicating complex interactions among sediment characteristics, contaminant mixtures, and bioavailability.

  Sediment chemistry results showed variable detection of pyrethroid pesticides reflecting heterogeneous watershed conditions and temporal variability. While some monitoring years exhibited reduced pesticide detections, toxicity to benthic organisms persisted, underscoring the challenges of fully mitigating pesticide-related impacts in urban watersheds. Collectively, these findings indicate that designated aquatic life beneficial uses are not consistently supported and that narrative toxicity objectives continue to be exceeded in certain locations and suggest the need for continued implementation of pesticide source control measures and adaptive management strategies.

1 Introduction

This Integrated Monitoring Report (IMR) was prepared by the Contra Costa Clean Water Program (CCCWP) on behalf of its 21 member agencies (19 cities/towns, County of Contra Costa, and Contra Costa County Flood Control and Water Conservation District). CCCWP reports monitoring progress and data to ensure its program members comply with the Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (MRP). The IMR and its appendices present data through written, statistical, and graphical analysis to summarize MRP Provisions C.8 and C.19 data in Contra Costa County.

This IMR, including appendices and attachments, fulfills the requirements of MRP Provision C.8.h.v for summarizing, interpreting, and reporting monitoring data collected during WYs 2020-2025 (October 1, 2019-September 30, 2025). All monitoring data presented in this report were submitted electronically to the San Francisco Bay Regional Water Quality Control Board by CCCWP (Attachment A). Data collected from receiving waters may be obtained via the California Environmental Data Exchange Network (CEDEN) website.[1] This website contains information related to data retrieval from the CEDEN Query Tool, the California State Open Data Portal, and the Tableau Public Visualization Tool.

1.1 Regulatory Context

Contra Costa County lies within the jurisdictions of both the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) (Region 2) and the Central Valley Regional Water Quality Control Board (CVRWQCB) (Region 5). Municipal stormwater discharges in Contra Costa County were previously regulated by the requirements of two NPDES stormwater permits: the MRP in Region 2 (Order No. R2-2015-0049) (MRP 2.0) and the East Contra Costa County Municipal NPDES Permit (Central Valley Permit) in Region 5 (Order No. R5-2010-0102).

Prior to the issuance of MRP 2.0 in 2015, the requirements of the two permits were effectively identical. With the reissued MRP, there were some differences between MRP 2.0 and the Central Valley Permit, although, in most respects, monitoring and reporting requirements remained similar. In 2019, to address differences between the two permits, per agreement between the Central Valley and San Francisco Bay Regional Water Quality Control Boards, the SFBRWQCB adopted Order No. R2-2019-0004 to include the eastern portion of Contra Costa County under the jurisdiction of the MRP, rendering the Central Valley Permit obsolete.

On May 11, 2022, the SFBRWQCB adopted the third Municipal Regional Stormwater NPDES Permit (Order No. R2-2022-0018) (MRP 3.0), which became effective July 1, 2022, at the start of the fourth quarter of WY 2022. With the issuance of MRP 3.0, Contra Costa County cities and agencies located in the CVRWQCB's geographic jurisdiction continue to be included as Permittees in the SFBRWQCB permit, subject to Provision C.8 monitoring and reporting requirements. Provision C.19 incorporates requirements from the CVRWQCB's TMDLs (total maximum daily load) and control programs applicable to East County Permittees.

[1] Information on how these data may be obtained is available at http://www.ceden.org/find_data_page.shtml.

1.2 Bay Area Municipal Stormwater Collaborative (BAMSC) Overview

In 2021, CCCWP joined with other stormwater program members to form the Bay Area Municipal Stormwater Collaborative (BAMSC)[2]. The goal of this regional collaborative is to coordinate Permittee advocacy, information sharing, and the implementation of consistent monitoring approaches, and to achieve the monitoring goals required by MRP 3.0. In July 2024, BAMSC reestablished the Regional Monitoring Coalition (RMC) to continue information sharing through bi-monthly workgroups. BAMSC RMC workgroup participants include the following stormwater programs:

- Alameda Countywide Clean Water Program (ACCWP)
- Contra Costa Clean Water Program (CCCWP)
- San Mateo Countywide Water Pollution Prevention Program (SMCWPPP)
- Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP)
- Solano Stormwater Alliance (SSA)

Details of respective BAMSC RMC stormwater program participants and their co-permittees are presented in Table 1.

Table 1 BAMSC Workgroup Participants

Stormwater Programs	Permittees
Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP)	Cities of Campbell, Cupertino, Los Altos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale, Los Altos Hills, and Los Gatos; Santa Clara Valley Water District; and Santa Clara County
Alameda Countywide Clean Water Program (ACCWP)	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 Water Agency
Contra Costa Clean Water Program (CCCWP)	Cities/Towns of Antioch, Brentwood, Clayton, Concord, El Cerrito, Hercules, Lafayette, Martinez, Oakley, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, Walnut Creek, Danville, and Moraga; Contra Costa County; and Contra Costa County Flood Control and Water Conservation District
San Mateo Countywide Water Pollution Prevention Program (SMCWPPP)	Cities and towns of Belmont, Brisbane, Burlingame, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Carlos, San Mateo, South San Francisco, Atherton, Colma, Hillsborough, Portola Valley, and Woodside; San Mateo County Flood Control District; and San Mateo County
Solano Stormwater Alliance (SSA)	Cities of Fairfield, Suisun City, Vallejo, and Vallejo Sanitation and Flood Control District

[2] In April 2021, the Bay Area Stormwater Management Agencies Association (BASMAA) dissolved. The coordination efforts of BASMAA have been replaced by the Bay Area Municipal Stormwater Collaborative (BAMSC), which is a less formal organization with no contracting capability. Reports and committees created by BASMAA and retained under BAMSC will be referred to as BAMSC reports and workgroups beginning with the water year 2023 urban creeks monitoring report. BAMSC will continue to serve as a consortium of municipal stormwater programs, representing over 90 agencies, including 79 cities and 6 counties, focused on regional challenges and opportunities to improve the quality of stormwater that flows to our creeks, the San Francisco Bay, the Sacramento-San Joaquin River Delta and the Pacific Ocean (CCCWP 2023a).

1.3 Report Organization

This report is organized by the sub-provisions of MRP Provision C.8, incorporating applicable sub-provisions of Provision C.19 as follows:

- Compliance Options (Provision C.8.a) (Section 2)
- Monitoring Protocols and Data Quality (Provision C.8.b) (Section 3)
- San Francisco Estuary Receiving Water Monitoring (Provision C.8.c) (Section 4)
- Low Impact Development (LID) Monitoring (Provision C.8.d) (Section 5 and Appendix 1)
- Trash Outfall Monitoring and Trash Receiving Water Monitoring (Provision C.8.e) (Section 6, Appendix 2 and Appendix 3)
- Pollutants of Concern Monitoring (Provisions C.8.f, C.11, and C.12) (Section 7 and Appendix 4)
- Pollutants of Concern Receiving Water Limitations Assessment Report Update (Provision C.8.f) (Section 7 and Appendix 5)
- Fate and Transport of Mercury and PCBs (Provision C.11 and C.12) (Section 7 and Appendix 6)
- Pesticides and Toxicity Monitoring (Provision C.8.g) (Section 8 and Appendix 7)
- East County Annual Mercury Monitoring Plan (Provision C.19.d) (Section 9 and Appendix 8)

Recommendations for changes to elements of Provision C.8 and C.19 in future permit terms are discussed in the applicable sub-provision Appendices. A summary of monitoring costs associated with each MRP monitoring component required under MRP 3.0 is discussed in subsection 1.4 in compliance with C.8.h.v.(4). Figure 1 displays the locations of CCCWP monitoring sites associated with MRP Provisions C.8, C.11, C.12 and C.19 compliance from WYs 2020-2025, including LID, trash outfall monitoring, trash receiving water monitoring, pollutants of concern (POC), pesticides and toxicity, and annual mercury and methylmercury monitoring sites.

Monitoring results discussed herein were performed in accordance with the requirements of MRP 3.0. Key technical findings, methods, results, and updates associated with these reports are summarized and provided in their respective appendices, as referenced within the applicable sections of the main body of this report.

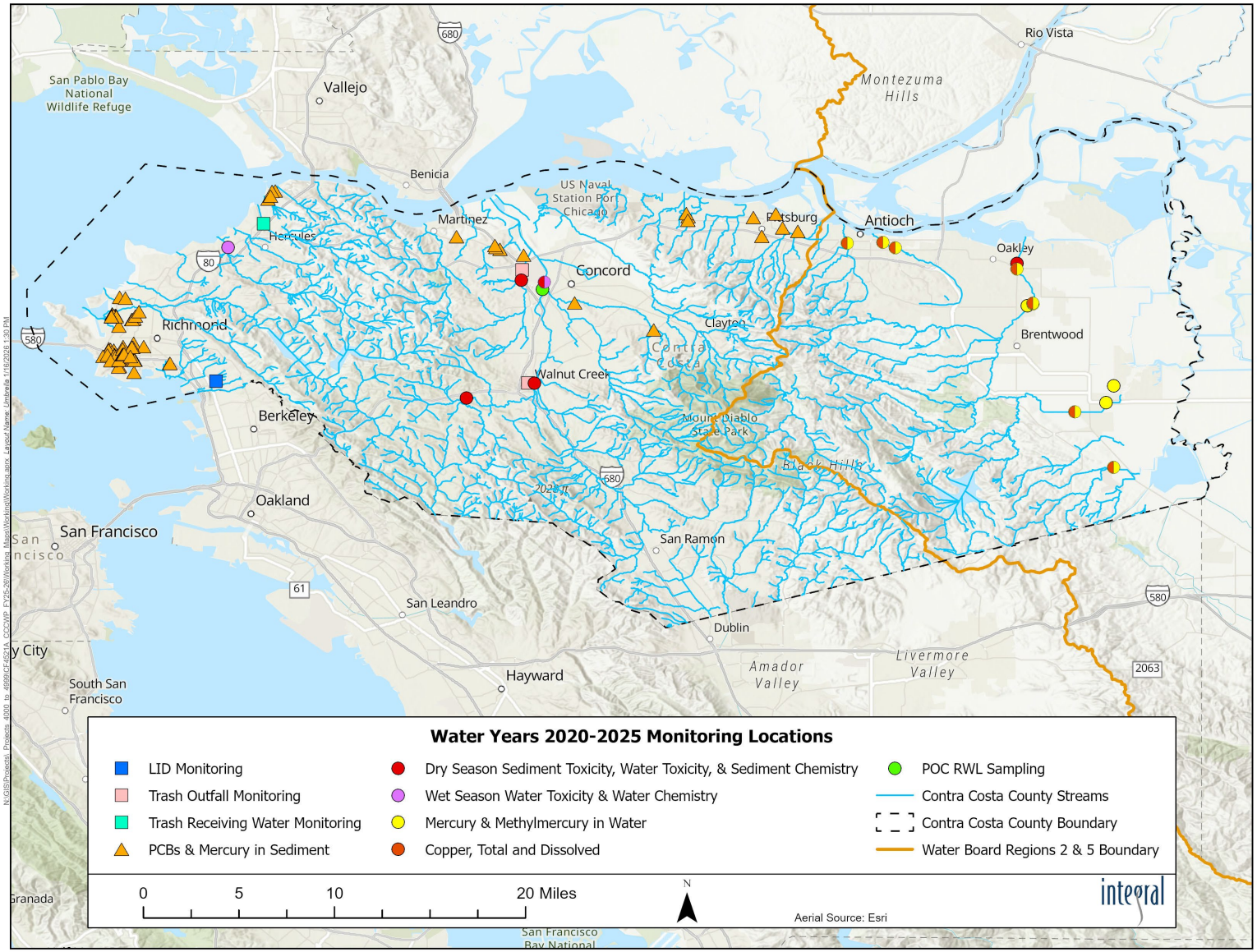

Figure 1 MRP Provision C.8 and C.19 Monitoring Sites in WYs 2020-2025

1.4 Monitoring Costs

Table 2 presents an annual budget summary for MRP 3.0 monitoring components. On average, monitoring costs in the form of payments to consultants, contractors, and regional collaboratives, such as the Regional Monitoring Program, cost a little over $1 million per year. Monitoring is the second-highest single cost after staff salaries.

Oversight of the monitoring program requires the attention of full-time technical professional staff, extensive involvement by the CCCWP program manager, and oversight by the Permittees who fund the program. The regional analysis and updates in this report are intended to guide the most effective and efficient use of funds to support future monitoring and make informed management decisions regarding monitoring. All monitoring requirements, recommendations, and subsequent costs should be deemed necessary and useful to help improve water quality and protect beneficial uses of water resources.

The annual budget for MRP 3.0 increased by about 15% on average year over year. Several factors are responsible for the increasing costs, including:

- High cost of C.8.d LID monitoring that began in FY 2023-24
- High cost of C.8.e trash receiving waters monitoring that began in FY 2023-24
- Implementation of increased C.11/12 monitoring under the EPA San Francisco Bay grant that began in FY 2025-26
- High cost of C.8.h reporting for the IMR in FY 2025-26
- Inflation, averaging about 3% annually

Table 2 Annual CCCWP Monitoring Budget Summary under MRP 3.0

MRP Provision and Monitoring Requirement	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
C.8.a Compliance Options [1]	7,500	7,725	8,863	8,750
C.8.b Monitoring Protocols and Data Quality [2]	-	-	-	-
C.8.c San Francisco Estuary Receiving Water Monitoring [3]	182,987	188,527	194,590	200,116
C.8.d Low Impact Development (LID) Monitoring	40,000	259,000	229,500	216,500
C.8.e Trash Outfall Monitoring	190,000	93,250	74,970	70,500
C.8.e Trash Receiving Water Monitoring (WOW Grant) [4]	-	57,520	103,181	71,275
C.8.f Pollutants of Concern (POC) Monitoring [5]	55,000	76,649	105,929	105,349
C.8.g Pesticides and Toxicity Monitoring	70,000	30,000	31,000	32,000
C.8.h Reporting	80,000	110,000	115,000	195,000
C.11/12 Mercury and Polychlorinated Biphenyls (PCBs) Controls	130,914	101,500	103,500	271,100 [6]
C.19 East County Monitoring and Reporting	80,000	43,500	65,000	62,700
TOTAL [7]	836,401	967,672	1,031,534	1,233,291

1 Cost for consultant participation in regional collaboration (BAMSC Monitoring/Pollutants of Concern Committee)
2 Costs associated with compliance of data quality standards and monitoring protocols are incorporated within specific subtask monitoring components
3 Contribution to the RMP, plus consultant participation in regional workgroups
4 Trash Receiving Water Monitoring costs are covered under USEPA Watching our Watersheds Grant. Budget for this row is presented as actual cost
5 Includes annual contribution to the RMP for emerging contaminants monitoring starting in FY 2023-24
6 Includes the USEPA San Francisco Bay Program grant-funded project in FY 25/26

7 Rounded to nearest dollar. Does not include contingency budgets or technical staff salaries

2 Compliance Options (C.8.a)

Provision C.8.a allows Permittees to comply with MRP 3.0 monitoring requirements through regional collaboration, the use of third-party monitoring data, or contributions to their countywide stormwater program. The primary method of regional collaboration on C.8 monitoring is through the BAMSC workgroup, which coordinates with and on behalf of member programs to comply with monitoring requirements and needs, including:

- Shared standard operating procedures
- Shared monitoring plans
- Shared quality assurance project plans (QAPPs)
- Regional reports
- Coordination and discussion with technical advisory groups
- Site selection and number of sites per program
- Timing of sampling events
- Data quality assurance and quality control procedures
- Database management

The main benefit of the BAMSC workgroup to the CCCWP Permittees is the assurance that results meet RWQCB expectations for data content and quality. The MRP defines the monitoring type, amount, and frequency; however, many execution details require best professional judgement (e.g., how to best screen LID and trash monitoring sites, select and configure sampling equipment, or identify acceptable data quality objectives). Discussion at the BAMSC workgroup meetings provides a point of communication and common documentation to align details across programs and allows the RWQCB to comment on the approach. The BAMSC workgroup is likely cost-neutral, as the staff time and consultant support required for collaboration are offset by cost efficiencies achieved through sharing methods and documents.

In addition to regional collaboration, CCCWP works with third-party water-quality monitoring partners to benefit local, regional, and statewide monitoring efforts. Provision C.8.a.iii allows Permittees to work with third-party organizations, such as the SFBRWQCB, CVRWQCB, State Water Resources Control Board, or California Department of Pesticide Regulation, to fulfill monitoring requirements if data meet water quality objectives described in Provision C.8.b. Monitoring locations in Contra Costa County are sampled in a manner to be comparable to the protocols of the state's Surface Water Ambient Monitoring Program (SWAMP) and assessed for pesticide pollution and toxicity through the Stream Pollution Trends (SPoT) Program (SWRCB 2021). SPoT monitors status and trends in sediment toxicity and sediment contaminant concentrations in selected streams and rivers throughout California and relates contaminant concentrations and toxicity test results to watershed land uses.

In addition, CCCWP supports efforts by local creek groups to monitor the San Pablo Creek, Wildcat Creek, Walnut Creek, and Marsh Creek Watersheds.

3 Monitoring Protocols and Data Quality (C.8.b)

Provision C.8.b of the MRP requires water quality data collected by the Permittees to comply with and be of a quality consistent with the State of California's SWAMP standards outlined in the SWAMP QAPP and standard operating procedures. Protocols and procedures were developed to assist permittees in meeting SWAMP data quality standards and to develop data management systems that allow Permittees easy access to water quality monitoring data.

3.1 Standard Operating and Data Quality Assurance Procedures

For LID monitoring, CCCWP developed a monitoring plan (CCCWP 2023b) and QAPP (BAMSC 2023a) for Executive Officer approval in May of 2023. The SFBRWQCB conditionally approved the monitoring plan and QAPP in August 2023. The BAMSC LID Monitoring Workgroup summarized the comments and drafted responses in September 2023 for ongoing discussion with the technical advisory group and Water Board staff. Per agreement with Water Board staff, a revised LID Monitoring Plan (CCCWP 2024c) was submitted to the Water Board on October 31, 2024. The Final LID Monitoring plan addressed comments received on the May 2023 LID monitoring plan and provided an improved understanding gained through the initial year of monitoring. In October of 2025, the BAMSC LID Monitoring Workgroup prepared a monitoring plan addendum, in coordination with Water Board staff, that provided revised QA/QC approaches and site-specific updates. The monitoring plan addendum was submitted to Water Board staff on October 3, 2025, prior to the start of monitoring in WY 2026 (CCCWP 2025b).

In WY 2023, the BAMSC Trash Monitoring Workgroup developed a Regional Trash Outfall Monitoring Plan (BAMSC 2023b) (Version 1.0) and QAPP (BAMSC 2023c) (Version 1.0) in compliance with Provision C.8.e of the MRP. The monitoring plan and QAPP were submitted to the SFBRWQCB for Executive Officer approval on July 31, 2023, in compliance with Provision C.8.e.vi. On August 31, 2023, the SFBRWQCB Executive Officer conditionally approved the Regional Trash Outfall Monitoring Plan, requiring that an updated plan be submitted in response to comments on July 31, 2024. The BAMSC Trash Monitoring Workgroup developed the Trash Outfall Monitoring Plan (Version 2.0) (BAMSC 2024a) and QAPP (Version 2.0) (BAMSC 2024b) in response to the conditional approval and submitted the updated plans on July 31, 2024. On January 30, 2025, the Trash Outfall Monitoring Plan and QAPP (Version 2.0) received final approval.

In WY 2024, the BAMSC Trash Monitoring Workgroup also developed a Regional Receiving Water Trash Monitoring Plan (Version 1.0) (BAMSC 2024c) and a QAPP (Version 1.0) (AMS 2024) that met the requirements of Provision C.8.e of the MRP. The monitoring plan and QAPP were submitted to the SFBRWQCB on July 31, 2024. On January 30, 2025, the Trash Receiving Water Monitoring Plan and QAPP were determined to satisfactorily address MRP requirements and were approved for continued implementation.

For POC monitoring, a sampling analysis plan (CCCWP 2024a) and QAPP (CCCWP 2024b) were developed in 2016 and finalized in 2020 to guide the monitoring efforts for each POC task. Both documents were revised in 2024 to update an error in the original documents about analytical holding times for mercury and PCBs in sediment. This update had no impact on data quality.

For POC receiving water limitations monitoring, a regional monitoring plan (BAMSC 2023d) was developed in March 2023 and conditionally approved by the SFBRWQCB in June 2023. An addendum to the plan was submitted in April 2024 following BAMSC workgroup collaboration to address required changes.

For pesticides and toxicity monitoring, CCCWP relied on the SOPs (BASMAA 2016) and QAPP (BASMAA 2020) previously developed by the Bay Area Stormwater Management Agencies Association (BASMAA) Regional Monitoring Coalition (RMC), the predecessor to the BAMSC workgroups, along with the most recent SWAMP QAPP (SWRCB 2022), to document the field and laboratory procedures necessary to produce SWAMP-comparable, high-quality data, as required by the MRP.

For East County mercury monitoring, CCCWP developed a monitoring plan (CCCWP 2023c) that was submitted to the SFBRWQCB as part of the 2022 urban creeks monitoring report. The East County Annual Mercury Monitoring Plan is updated annually and guides the monitoring efforts for each mercury monitoring task to be performed in current and subsequent water years.

4 San Francisco Estuary Receiving Water Monitoring (C.8.c)

CCCWP contributes to the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP), specifically the Status & Trends Monitoring Program (S&T Program) and the Pilot and Special Studies (P/S Studies). Brief descriptions of the S&T Program and P/S Studies are provided below.

As described in MRP Provision C.8.c, Permittees must conduct or cause to be conducted receiving water monitoring in San Francisco Bay (the Bay). Permittees comply with this provision by making financial contributions through CCCWP to the RMP. Additionally, Permittees actively participate in RMP committees and work groups through Permittee and/or stormwater program representatives.

The Sacramento-San Joaquin River Delta (Delta) RMP serves a similar function by fulfilling receiving water monitoring requirements for dischargers within the CVRWQCB's jurisdiction. Some CCCWP Permittees (the cities of Brentwood, Antioch, and Oakley, and portions of unincorporated Contra Costa County and the Contra Costa County Flood Control District) are located within the CVRWQCB's jurisdiction; however, by agreement with the SFRWQCB and the CVRWQCB, those Permittees also meet receiving water monitoring requirements through funding of the San Francisco Bay RMP. This is consistent with the historic approach of managing the entire countywide program as a single, integrated program.

The RMP is a long-term, discharger-funded monitoring program directed by a steering committee and represented by regulatory agencies and the regulated community. In addition to regulators and the regulated community, the RMP Technical Committee includes participation by a local, non-governmental organization specializing in water quality in the Bay. The goal of the RMP is to assess water quality in the Bay. The regulated community includes the Permittees, publicly owned treatment works, dredgers, and industrial dischargers.

The RMP is intended to answer the following core management questions:

- *Are chemical concentrations in the estuary potentially at levels of concern, and are associated impacts likely?*
- *What are the concentrations and masses of contaminants in the estuary and its segments?*
- *What are the sources, pathways, loadings, and processes leading to contaminant-related impacts in the estuary?*
- *Have the concentrations, masses, and associated impacts of contaminants in the estuary increased or decreased?*
- *What are the projected concentrations, masses, and associated impacts of contaminants in the estuary?*

The RMP budget is generally divided into two major program elements: status and trends monitoring, and Pilot/Special Studies. The RMP publishes reports and study results on its website at www.sfei.org/rmp .

4.1 RMP Status and Trends Monitoring Program

The S&T Program is the long-term contaminant monitoring component of the RMP. The S&T Program was initiated as a pilot study in 1989 and redesigned in 2007 to adopt a more rigorous statistical design to detect trends. The S&T Program comprises the following program elements:

- Long-term water, sediment, and bivalve monitoring
- Episodic toxicity monitoring
- Sport fishing monitoring
- U.S. Geological Survey hydrographic and sediment transport studies
- Factors controlling suspended sediment in San Francisco Bay
- U.S. Geological Survey monthly water quality data
- Triennial bird egg monitoring (cormorant and tern)

Additional information on the S&T Program and associated monitoring data is available for download via the RMP website at www.sfei.org/content/status-trends-monitoring.

4.2 RMP Pilot and Special Studies

The RMP conducts pilot and special studies annually through committees, workgroups, and strategy teams. Studies are typically designed to investigate and develop new monitoring measures related to anthropogenic contamination or contaminant effects on biota in the estuary. Special studies address specific scientific issues that RMP committees and standing workgroups identify as priorities for further research. These studies are developed through an open selection process at the workgroup level and are selected for additional funding through RMP committees. Results and summaries of the most pertinent pilot and special studies can be found on the RMP website (http://www.sfei.org/rmp).

4.3 Participation in Committees, Workgroups, and Strategy Teams

CCCWP and/or other BAMSC representatives participate in the following RMP committees and workgroups:

- Steering Committee
- Technical Review Committee
- Sources, Pathways, and Loadings Workgroup
- Emergent Contaminant Workgroup
- Nutrient Technical Workgroup
- Strategy teams (e.g., small tributaries, PCBs)

Committee and workgroup representation are provided by CCCWP, other stormwater program staff, and/or individuals designated by stormwater program participants. Representation includes participation in meetings, review of technical reports and work products, co-authoring or reviewing of articles included in the RMP's annual publication, *Pulse of the Bay*, and general program direction to RMP staff. Representatives of the RMP also provide timely summaries and updates to and receive input from BAMSC stormwater program representatives (on behalf of the Permittees) during workgroup meetings to ensure the Permittees' interests are represented.

5 Low Impact Development (LID) Monitoring (C.8.d)

MRP Provision C.8.d requires Permittees to conduct LID monitoring that is intended to measure compliance and effectiveness of LID controls. LID monitoring is anticipated to improve the understanding of the benefit of LID implementation, in particular, green stormwater infrastructure, on pollutant loading and hydrology of receiving waters within Permittees' jurisdictions, at different space and time scales, and inform the design, construction, operation, and maintenance (O&M) and future implementation of LID. LID Monitoring may also be used to calibrate and validate models that estimate pollutant removal effectiveness and inform sizing of LID facilities (e.g., countywide C.3 technical guidance documents, reasonable assurance analysis models, and other sizing and assessment models).

LID Monitoring is intended to answer both of the following two management questions:

- *What are the pollutant removal and hydrologic benefits, such as addressing impacts associated with hydromodification, of different types of LID facilities, systems, components, and design variations, at different spatial scales (e.g., single control vs watershed or catchment scale), and how do they change over time?*
- *What are the minimum levels of O&M necessary to avoid deteriorated LID facilities, systems, and components that reduce pollutant removal and hydrologic performance?*

CCCWP, with its member agencies and consultants, selected one LID facility, the Ohlone Greenway Rain Garden, to meet the minimum required number of stormwater sampling events annually (three) and to work toward the required number of stormwater sampling events that must be collected during the permit term (n = 25).

The Ohlone Greenway LID facility is a bioretention stormwater treatment facility located in the City of El Cerrito near the intersection of Fairmont Avenue and Richmond Street. It was constructed in 2014 and provides treatment of approximately 1.7 acres along the south side of Fairmount Avenue in the City of El Cerrito, including runoff from older single-family residential and mixed land uses. This facility is relatively unique in that it treats a much larger area than most urban LIDs and has a relatively large footprint on the landscape. The LID facility basin is unlined to promote infiltration to the underlying soils.

CCCWP established a monitoring station at the Ohlone Greenway LID facility in WY 2023 and subsequently conducted monitoring in WYs 2024 and 2025. A total of 12 successful storms were monitored in WYs 2024 and 2025, with additional monitoring planned to continue through the MRP permit term. The hydrologic, water-quality, and maintenance assessment results associated with the 12 monitored storm events are presented in Appendix 1. This includes comparisons with water quality benchmarks, a water balance assessment, and a regional analysis using monitoring data from other BAMSC counties. Appendix 1 also presents a statement of data quality, conclusions from the first two seasons of monitoring, and regional monitoring recommendations to help inform MRP 4.0 monitoring goals. A brief summary of key findings from WYs 2024 and 2025 monitoring is presented below.

Key hydrologic results include:

- The Ohlone Greenway facility consistently functioned as designed throughout the monitoring period.
- Across 12 monitored storm events, no overflow occurred, indicating full treatment of all influent runoff.
- On average, stormwater inputs were balanced by:
  - Outflow through the underdrain (approximately 56%)
  - Storage in soil media (approximately 31%)
  - Exfiltration to native soils (approximately 17%)
- The facility provided substantial hydromodification benefits, including reduced runoff volumes, attenuated peak flows, and delayed discharge to the municipal storm drain system.

Key water quality results include:

- The facility demonstrated strong and consistent reductions in sediment-associated constituents:
  - TSS: 93% average concentration reduction and 96% average load reduction
  - Total copper, mercury, and zinc: 38–83% concentration reductions and 64–90% load reductions
  - Total PCBs: 88% concentration reduction and 93% load reduction
- These results confirm the effectiveness of the Ohlone bioretention system at removing particulate-bound pollutants and, by extension, other sediment-associated contaminants not directly measured.
- Dissolved copper and mercury concentrations generally increased in effluent, likely due to partitioning from the particulate phase via interaction with organic matter in the soil media.
- Despite concentration increases, dissolved copper and mercury loads decreased overall, reflecting reduced effluent volumes.
- Dissolved zinc showed consistent concentration and load reductions, likely due to stronger sorption and cation exchange processes within the bioretention media.
- Substantial reductions were observed for both diesel- and motor oil-range hydrocarbons.
- Longer-chain motor oil fractions exhibited greater removal efficiency than diesel-range compounds.
- PFAS concentrations were low relative to available freshwater benchmarks, however total PFAS concentrations and loads increased from influent to effluent in all monitored storm events.
- Results indicate that conventional bioretention facilities do not reliably remove PFAS and may reflect transformation of precursor compounds or leaching from facility materials.

Key maintenance assessment results include:

- Weekly routine maintenance and periodic corrective actions conducted by the City of El Cerrito were sufficient to maintain optimal facility performance.
- No facility deterioration was observed during the monitoring period.
- Site-specific data did not reveal measurable relationships between time since maintenance and pollutant removal or hydrologic performance.

Key regional findings include:

- Across the Bay Area, bioretention facilities consistently achieved high reductions in TSS, total metals, PCBs, and TPH.
- PFAS results were highly variable among facilities and counties.
- The coordinated regional monitoring framework improved data consistency, interpretability, and collective understanding of LID performance.

Regional recommendations include:

- Streamline monitoring requirements – reduce the minimum number of required sampling events while continuing monitoring into the MRP 4.0 permit term to better assess long-term performance trends.
- Refine target analytes - remove TPH and PFAS from routine LID monitoring due to analytical challenges, limited regulatory utility, and demonstrated treatment limitations.
- Align maintenance evaluation with asset management - shift assessment of maintenance effectiveness to MRP asset management programs rather than LID monitoring, reducing duplication of effort.
- Enhance adaptive management and coordination - continue regional collaboration through BAMSC and engage TAG input as needed rather than on a fixed schedule.

6 Trash Monitoring (C.8.e)

MRP Provision C.8.e requires Permittees to conduct trash monitoring that is intended to 1) verify whether the Permittees' trash control actions to-date have effectively prevented trash from their jurisdictions from discharging to receiving waters, and 2) evaluate whether discharges of trash from areas of the Permittees' jurisdictions where full trash capture equivalency (full trash capture devices and/or other actions verified with on-land visual trash assessments, as referenced in Provision C.10.b.iii) has been achieved are causing and/or contributing to adverse trash impacts in receiving waters.

Trash monitoring is intended to address the following management and monitoring questions:

- *Have Permittees' trash management actions effectively prevented trash from their jurisdictions from discharging to receiving waters?*
- *Are discharges of trash from areas within Trash Management Areas controlled to a low trash generation level, causing and/or contributing to adverse trash impacts in receiving waters?*

In WYs 2024-2025, two trash outfall sites (CC-PCH and CC-WC) were monitored for six storm events each (three events during each water year), including first flush, an event predicted to exceed the full trash capture device design standard (i.e., the one-year, one-hour storm event), and a third event forecast to trigger trash discharge through the municipal separate storm sewer system (MS4) (e.g. 0.25 inches of rain over a 24-hr. period). At both sites, all six target storm events were sampled successfully in WYs 2024-2025. Trash samples were stored during the wet season and transported in the spring for third-party analysis of trash volume and characterization at the end of the storm season.

Annual trash loading for the outfall in Pacheco (CC-PCH) was determined using linear regression statistical analyses on two independent storm variables (rainfall intensity and peak flow) that influence trash transport into the MS4. Annual trash loading estimate by variable at site CC-PCH were similar in range for the two years: 1.72 to 1.32 gallons/acre/year for maximum rainfall intensity, and 3.59 to 3.20 gallons/acre/year for peak flow. The annual trash load estimate for the site in Walnut Creek (CC-WC) was calculated to be <0.01 gallons/acre/year. The annual trash load estimate for CC-WC is based on five out of six samples containing no trash, and one sample containing less than 0.03 ounces.

Detailed results from the six storm events at two trash outfall monitoring sites in Contra Costa County are presented in Attachment B of Appendix 2, along with annual hydrographs, storm event hydrographs, catchment area analysis and discussion, and annual trash load calculations for outfalls in Contra Costa County.

In addition to trash outfall monitoring, CCCWP identified and selected one receiving water monitoring location (located in Rodeo Creek in the unincorporated community of Rodeo) in WY 2024. In WY 2025, CCCWP collected three samples at this location during three storm events, including the first seasonal flush and two events that exceeded the minimum desired rainfall threshold. Annual trash loading rates were calculated using a simple model that utilized the mean trash concentrations for all aliquots. The mean trash concentration during stormflow was multiplied across the entire stormflow hydrograph for WY 2025 monitoring. Using this simple method, trash loading rates for the Rodeo Creek site in Contra Costa County was 0.01

gallons/acre/year. A further comprehensive discussion of regional trash-receiving water monitoring efforts is presented in Appendix 3.

7 Pollutants of Concern Monitoring (C.8.f, C.11, C.12, and C.19.d)

POC monitoring is intended to assess inputs of POCs to the Bay and Delta from local tributaries and urban runoff, assess compliance with receiving waters limitations, assess progress toward achieving wasteload allocations for TMDLs, and help resolve uncertainties associated with loading estimates for these pollutants.

Under MRP Provision C.8.f., POC monitoring addresses six priority management information needs (identified as Monitoring Types in Provision C.8.f Table 8.1):

1. *Source Identification – identifying or confirming 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 – evaluating the effectiveness or impacts of existing management actions, including compliance with TMDLs and other POC requirements, and providing support for planning future management actions;*
4. *Loads and Status – providing information on POC loads, concentrations, and presence in local tributaries or urban stormwater discharges;*
5. *Trends – evaluating trends in POC loading to the Bay and POC concentrations in urban stormwater discharges or local tributaries over time; and*
6. *Compliance with Receiving Water Limitations – providing information to assess whether receiving water limitations are achieved.*

Under Provisions C.11 and C.12, CCCWP addresses the mercury and PCBs TMDLs through implementation of its Old Industrial Control Measure Plan. During the permit term, CCCWP is required to investigate 1,700 acres of likely mercury or PCBs source properties and treat 664 acres of moderately contaminated areas.

Under Provision C.19.d.ii.(2), East County Permittees located in the jurisdiction of the CVRWQCB, including the cities of Antioch, Brentwood, and Oakley, unincorporated Contra Costa County, and the Contra Costa County Flood Control and Water Conservation District, must comply with POCs monitoring to address the Delta Methylmercury TMDL. Methylmercury monitoring in East County is designed to answer the following management questions:

a) *What are the annual methylmercury loads from the MS4 discharge to the Central Delta, Marsh Creek, and West Delta subareas?*
b) *Do the methylmercury loads to each subarea meet the assigned methylmercury wasteload allocations?*

c) *Are there any MS4 design features that increase mercury methylation in the discharge?*

d) *What MS4 water quality controls have been implemented or are planned to be implemented to reduce methylmercury production and transport in the MS4 discharge?*

e) *By January 1, 2024, address whether eutrophication and low dissolved oxygen concentrations increase methylmercury in ponded areas of Marsh Creek during low flow periods (depending on the year, low flow periods can range between mid-March and mid-November), and, if so:*

   i. *Under what hydrologic or seasonal circumstances do increased methylmercury concentrations reach the Delta?*

   ii. *Are there reasonable and foreseeable management actions to ameliorate increased methylmercury concentrations?*

7.1 Pollutants of Concern Monitoring Activities and Results

During WYs 2020-2025, since the issuance of the previous IMR, the following monitoring activities were completed:

- Sediment screening for mercury and PCBs in suspected high-opportunity areas for pollutant control; street dirt and MS4 drop inlet sampling (MRP 2.0)
- Confirmatory stormwater sampling for mercury and PCBs in suspected high-opportunity areas (MRP 2.0)
- Stormwater sampling for copper and nutrients (MRP 2.0)
- Methylmercury water sampling, wet and dry seasons (MRP 2.0, 2019 amendment)
- Sediment sampling for mercury and PCBs in suspected source areas; Monitoring Types 1 and 2 (MRP 3.0)
- Stormwater sampling for mercury and PCBs collected in compliance with Provision C.8.d to evaluate the effectiveness of LID green infrastructure; Monitoring Type 3 (MRP 3.0)
- Stormwater sampling for copper; Monitoring Type 4 (MRP 3.0)
- Stormwater sampling for emerging contaminants; Monitoring Type 4 (MRP 3.0)
- Sediment screening confirmational sampling for mercury and PCBs in old industrial focus areas identified by previous monitoring results; Monitoring Type 5 (MRP 3.0)
- Receiving water limitations (RWL) monitoring; Monitoring Type 6 (MRP 3.0)
- Mercury and methylmercury water sampling in West Delta, Marsh Creek, and Central Delta subareas; (management and monitoring information needs specific to Provision C.19, MRP 3.0)

WYs 2020-2025 POC monitoring activities including methods, results, and discussions are detailed in Appendix 4 (Pollutants of Concern Monitoring Report) and Appendix 5 (Pollutants of Concern Receiving Water Limitations Report Update). The following paragraphs briefly summarize these activities and results.

POCs monitoring included sediment, stormwater, surface water, and RWL assessments to evaluate pollutant concentrations, identify sources, assess compliance with TMDLs, and inform

management actions. Target pollutants included PCBs, mercury, copper, nutrients, emerging contaminants, RWL analytes, and methylmercury, with sampling conducted in sediment, stormwater, and surface waters.

Key monitoring results include:

- **PCBs.** Countywide sediment screening of 121 samples identified 28 samples exceeding the moderate source threshold (>0.200 ppm) and 9 samples exceeding the high-source threshold (>1.00 ppm). Elevated PCB concentrations were highly concentrated in Richmond and adjacent unincorporated areas, particularly within historic industrial land uses. Stormwater sampling confirmed that elevated sediment concentrations correspond to elevated concentrations in runoff, supporting source identification and referral actions.
- **Mercury.** Elevated concentrations of mercury were more broadly distributed than PCBs. Sixty-one sediment samples exceeded the moderate threshold (>0.300 ppm) and 34 exceeded the high-source threshold (>0.500 ppm). Elevated mercury concentrations were observed in Richmond, Rodeo, Concord, and Martinez. Results indicate both localized industrial influences and broader regional distribution.
- **Copper and Nutrients.** Copper monitoring in Lower Marsh Creek (WYs 2020–2021) and in Walnut Creek and Delta tributaries (WYs 2023 and 2025) showed dissolved and total copper concentrations below applicable acute and chronic water quality criteria under a range of flow conditions. Nutrients monitoring indicated elevated phosphorus concentrations, reflecting ambient watershed conditions rather than stormwater-driven exceedances.
- **Emerging Contaminants.** Five water samples collected in WY 2025 through the RMP Emerging Contaminants Monitoring Strategy addressed high-priority management questions related to watershed and stormwater modeling. This effort satisfied MRP requirements through regional collaboration.
- **Receiving Water Limitations.** RWL monitoring conducted at Walnut Creek during WYs 2024–2025 (four wet-season and one dry-season sample) found concentrations of RWL constituents generally consistent with expectations for an urban creek and meeting applicable water quality objectives.
- **Methylmercury (East County).** East County monitoring in the West Delta, Central Delta, and Marsh Creek subareas included 43 methylmercury samples. Seventeen samples exceeded the assumed Delta methylmercury threshold, primarily during storm events with high suspended sediment concentrations. Dry weather samples in Marsh Creek showed elevated methylmercury to mercury ratios, indicating enhanced methylation under low-flow conditions. Average methylmercury concentrations in the West Delta and Central Delta subareas were below RAA model assumptions, while Marsh Creek exceeded modeled assumptions during wet weather.
- **Compliance Status and Outlook.** Based on monitoring conducted during WYs 2020–2025, CCCWP met or exceeded all minimum annual and cumulative monitoring requirements under MRP 3.0. Approximately 808 acres of old industrial land were investigated during this period, with remaining areas scheduled for completion by the end of the permit term. Lessons learned highlight the effectiveness of targeted sediment screening, the importance

of private property investigations, and the value of integrating sediment and water data. These findings will help guide refinements to monitoring and source control strategies under MRP 4.0, with continued emphasis on reducing PCB and mercury loads to the San Francisco Bay and Sacramento–San Joaquin River Delta.

7.2 Stormwater Monitoring Strategy for Emerging Contaminants

MRP Provision C.8.f.ii requires participation by Permittees in the regional stormwater monitoring strategy for emerging contaminants. Provision C.8.f.ii (Table 8.2, footnote c) of MRP 3.0 states:

> *Permittees, collectively, shall produce or cause to be produced a stormwater monitoring strategy for emerging contaminants (ECs) by April 1, 2023, that prioritizes ECs for stormwater monitoring listed in this table and possibly others, and establishes an approach for sampling stormwater ECs based on specific or likely physico-chemical properties, sources, transport pathways, and fate of prioritized ECs. Permittees must conduct or cause to be conducted ECs stormwater monitoring to execute the ECs stormwater monitoring strategy at a level of effort indicated in the table. This level of effort can be satisfied either through sampling and analysis of the number of samples indicated in this table or through augmentation of the San Francisco Bay Regional Monitoring Program Emerging Contaminants Monitoring Strategy in the amount of $100,000 per year for all Permittees combined.*

As approved by the CCCWP Management Committee, Permittees have agreed to satisfy this MRP requirement by annually contributing their share of $100,000 to augment the RMP's Emerging Contaminant Monitoring Strategy[3]. For Permittees in Contra Costa County, annual contributions of $21,649 will be made through CCCWP (Table 2).

Table 3 Contributions the MRP Permittees have agreed to make annually to augment the RMP's Emerging Contaminant Monitoring Strategy during the term of the permit

Permittee Group	Annual Contribution	Relative Percentage[1]
Alameda County Permittees	$30,923	30.92%
Contra Costa County Permittees	$21,649	21.65%
Santa Clara County Permittees	$33,489	33.49%
San Mateo County Permittees	$13,939	13.94%
Total	***$100,000***	***100%***

1 Relative percentage is based on the populations within the MRP-associated portions of each county at the start of MRP 3.0 (Department of Finance, January 2022)

From WYs 2019 to 2022, the RMP conducted a major multi-year study to provide screening-level data (occurrence and concentrations) and to evaluate the role of stormwater as a transport pathway for a suite of contaminants identified as important to the Bay. This monitoring effort spanned four wet seasons (WYs 2019-2022), sampled both urban and reference (minimally developed) sites during storm events, and analyzed five broad classes of contaminants: per- and polyfluoroalkyl substances (PFAS), organophosphate esters, bisphenols, ethoxylated surfactants,

[3] A link to The Contaminants of Emerging Concern report from SFEI

and tire- and vehicle-derived compounds (SFEI 2024). In WYs 2024 and 2025, the RMP continues to focus on POCs and contaminants of emerging concern (CECs) in stormwater, including:

- **Stormwater CECs Monitoring and Modeling.** This project continued implementing the RMP stormwater CECs integrated modeling and monitoring program as outlined in the Stormwater CECs approach. It built on prior stormwater CECs RMP projects that have identified priority near-term management questions, identified the modeling and data analysis approach to address these management questions, and developed and piloted a small, automated remote sampler for stormwater monitoring. Efforts focused on collection for PFAS analysis at up to 28 sites using the remote sampler and at up to nine sites using manual sampling methods. Using funds from several add-on projects at the manual sites, samples for other analytes will be collected, including legacy pollutants (PCBs, mercury, metals, SSC), a large array of PFAS and PFAS-related compounds, fibers, tire- and road-related chemicals, and non-target analysis. This monitoring and modeling will continue in 2026.
- **Priority Margin Unit (PMU) Monitoring.** San Leandro Bay Study. A major project that began in 2023 and is continuing over the next several years is developing an in-Bay fate model for PCBs and other contaminants. A second phase of work on this project was completed in the summer of 2025 with the publication of a report evaluating PCBs recovery in San Leandro Bay under different management scenarios. Model results indicate that PCBs recovery is highly dependent on watershed load reductions. The findings provide a framework for improving future contaminant-fate modeling across other PMUs and the Bay as a whole. OPTICS instrumentation (collecting data measurements for hydrodynamic and sediment transport) was used to measure contaminant and sediment flux in San Leandro Bay as part of this study.
- **Tidal Area Remote Sampler Pilot.** To increase capacity and reduce costs for stormwater monitoring, beginning in WY 2023 and continuing through 2026, RMP scientists and engineers are developing and testing innovative remote samplers to reduce the need for intensive manual sampling during storms. Based on lessons learned in the first two years, further refinements to the sampler and sampling in creeks were conducted for WY 2025 and are continuing in WY 2026.
- **Passive Sampling.** Passive sampling is a monitoring technique based on the diffusion of contaminants into an absorbent material that is placed in the environment to accumulate a representative sample. Researchers from Stanford University led two RMP-funded studies using passive sampling of PCBs in San Leandro Bay and another PMU identified as the Steinberger Slough/Redwood Creek.
- **Microplastics Stormwater Monitoring Pilot.** In this field study, which began in 2024, RMP collected simultaneous single-depth and depth-integrated samples at two field sites and compared the microplastics content of these samples using advanced laboratory techniques that characterize tire wear and other fine particles. This study aims to provide a better characterization of microplastics in receiving waters during storm events, to inform estimates of load magnitude, and to support the development of standardized microplastics sampling methods.
- **Watershed Dynamic Model.** The Watershed Dynamic Model (WDM) is a lumped-parameter dynamic model capable of simulating a variety of land-use types, a wide range of

contaminants, upland erosion and sediment transport, and in-stream processes at an hourly scale. The first versions of the water and sediment modules of the WDM were completed in 2021 and 2022 for WYs 1995-2020. The WDM is now being recalibrated to include 2020 land use and expanded to include contaminant load simulation (PCBs and mercury as pilot cases).

- **CEC Modeling.** A CEC load modeling review recommended a data-driven approach that combines statistical manipulations of limited monitoring data with modeled flow estimates to make initial estimates of regional-scale CEC loads. Later, if the need arises and data are available, CEC models may also be developed. In 2025, the RMP completed the first watershed-bay modeling strategy and two pilot applications of a coupled watershed-bay model to simulate the fate of sediment and dissolved-phase contaminants in the Bay.

8 Pesticides and Toxicity Monitoring (C.8.g)

The Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (MRP) contains requirements for pesticides and toxicity monitoring in urban creeks (SFBRWQCB 2022). Pertaining to pesticides and toxicity monitoring, MRP Provision C.8.h.v requires the following as part of the Integrated Monitoring Report (IMR):

1. A Pesticides and Toxicity Monitoring Status Report covering the methods and results of pesticides and toxicity monitoring conducted during WY 2025, and
2. A comprehensive analysis of all data collected pursuant to Provision C.8 since the previous Integrated Monitoring Report (i.e., WYs 2020-2025, inclusive), excluding creek status monitoring conducted under the requirements of MRP 2.0.

MRP Provision C.8.g. (Pesticides and Toxicity Monitoring) contains the following elements designed to assess potential pesticides contamination and associated toxicity in urban creeks:

- Wet weather pesticides and toxicity monitoring (water column)
- Toxicity in the water column – dry weather
- Toxicity, pesticides, and other pollutants in sediment – dry weather

The monitoring described in this section and presented in Appendix 7 is responsive to the monitoring requirements of MRP Provision C.8.g, as well as the follow-up notification requirements specified in MRP Provision C.8.g.iv and the reporting requirements specified in MRP Provision C.8.h.

8.1 Dry Weather Chemistry and Toxicity Testing, WY 2025

Dry weather water and sediment samples were collected from a site on lower Marsh Creek (site ID 544R02505) on July 22, 2025, and tested for toxicological and chemical parameters as required by the MRP. Quality assurance/quality control (QA/QC) procedures were implemented as specified in the Regional Monitoring Coalition (RMC) QAPP (BASMAA 2020), and monitoring was performed per protocols specified in the RMC standard operating procedures (SOPs; BASMAA 2016) and in conformity with California's Surface Water Ambient Monitoring Program (SWAMP) protocols, as required by the MRP.

During the WY 2025 dry weather monitoring, the water samples were toxic to both the algae *Selenastrum capricornutum* (95% effect) and the invertebrate crustacean *Ceriodaphnia dubia* (20.5% effect). Because the *Selenastrum* percent effect exceeded 50%, resampling and retesting were required at the Marsh Creek site for this species. The retest sample collected September 16, 2025 was not toxic.

The sediment sample was toxic for the aquatic invertebrate *Hyalella azteca* with a 36% effect. This effect level was not sufficient (i.e., >50%) to warrant a retest. Toxicity to *Hyalella* has been a common occurrence in urban creeks throughout the Bay Area and California over the past 20 years (see, e.g., Ruby 2013).

In the chemical analysis of the sediments, all seven heavy metals were detected, as is typical for urban creek sediments. However, no polycyclic aromatic hydrocarbons (PAH) compounds were

detected in the WY 2025 Marsh Creek sediment sample. Although this is atypical for Bay Area urban creek sediments in general, there were also no detected PAH compounds in the WY 2024 testing of the same site (site ID 544R02505; CCCWP 2025a).

Also uncharacteristically, no pyrethroid pesticides were detected in the WY 2025 Marsh Creek sediments, and no fipronil compounds were detected. Organic carbon (as sediment TOC) was relatively low, at 0.56% dry weight.

8.2 Comprehensive Analysis of Monitoring Data, WYs 2020-2025

Per MRP Provision C.8.h.v, the Permittees are required to submit an IMR that includes a comprehensive analysis of all data collected since the previous IMR, which covered the period through and including WY 2019. However, as specified in MRP footnote #48, the current IMR is to exclude creek status monitoring conducted after the submittal of the previous IMR. This comprehensive analysis, therefore, does not cover the bioassessment monitoring and associated water-quality monitoring conducted during WYs 2020-2022 at 10 sites in Contra Costa County, each site monitored annually.

The period encompassing WYs 2020-2025 spanned MRP 2.0 and MRP 3.0, which was adopted in 2022. During that period, CCCWP undertook the following monitoring related to pesticides and toxicity, in accordance with Provision C.8.g under first MRP 2.0 and then MRP 3.0:

Wet weather water column pesticides chemistry and aquatic toxicity monitoring at two urban creek sites during WY 2023.

Dry weather water column toxicity and sediment chemistry and toxicity at one urban creek site annually, WY 2020-2025.

Wet weather water samples were collected from urban creeks in the MRP region during an early-season storm event on November 8, 2022 (WY 2023). In Contra Costa County, wet weather samples were collected from Walnut Creek at Concord Avenue (site ID 207R02615) and from Pinole Creek (site ID 206PNL010). The samples were tested for toxicity to several different aquatic species and analyzed for a suite of pesticide compounds, as required by the MRP.

Both the Walnut Creek (site ID 207R02615) and Pinole Creek (site ID 206PNL010) stormwater samples collected on November 8, 2022 were toxic to *Hyalella azteca*. The toxic effect in the Walnut Creek sample was 50% of the lab control; therefore, the *Hyalella azteca* test required retesting with sample water collected during wet weather at the Walnut Creek site.

Samples for the retest were collected at the Walnut Creek site during a storm event on January 10, 2023. In the retest, the sample was again toxic to *Hyalella azteca*, but the toxic effect was less than 50%.

The measured pyrethroid concentrations in the wet weather samples were sufficient to cause the toxicity observed in both the Walnut Creek (site ID 207R02615) and Pinole Creek (site ID 206PNL010) November 8, 2022 stormwater samples, as well as in the Walnut Creek January 10, 2023 retest sample, due principally to elevated concentrations of bifenthrin, cyhalothrin/lambda, and deltamethrin. The pyrethroid sediment concentrations in the November 8, 2022 stormwater samples were particularly high, with pyrethroid toxic unit equivalents (TUs) measuring 23.5 at the

Walnut Creek site and 17.3 at the Pinole Creek site. Toxicity is likely when the calculated TU exceeds 1.0.

In dry weather, the CCCWP Permittees annually collect water and sediment samples from one urban creek site, perform toxicity tests on water and sediment samples, and conduct chemical analysis of sediment samples, as required by the MRP.

Toxicity in dry weather water samples occurred to *Ceriodaphnia dubia* in WYs 2021 and 2025; in both cases, the acute test (survival) passed, but the chronic test (reproduction) failed. Water samples also were toxic to *Hyalella azteca* (WY 2021), *Chironomus dilutus* (WY 2023), and *Selenastrum capricornutum* (WY 2025).

All seven metals were detected in every dry weather sediment sample analyzed from WY 2020-2025.

Detections of PAHs were highly variable, ranging from 10 PAHs detected at Grayson Creek (site 207R01547) in WY 2020 and 11 detected at Walnut Creek (site 207R02615) in WY 2023, to zero detections at Marsh Creek (site 544R02505) in both WY 2024 and 2025.

Pyrethroid pesticides were commonly detected in sediment samples at the rate of 3-5 pyrethroids per sample in every year except WY 2025, during which no pyrethroids were detected. Analysis of the sediment grain-size distributions indicated that relatively low percentages of smaller particles may have influenced the WY 2025 pyrethroid sediment chemistry results. Neither carbaryl nor fipronil nor its degradates were detected in any sediment samples collected during WYs 2020-2025.

The only toxic sediment test results occurred in WYs 2024 and 2025, in both cases to *Hyalella azteca*. Pyrethroid TUs calculated from dry weather sediment chemistry data exceeded 1.0 only in the Marsh Creek sample during WY 2024, coinciding with sediment toxicity to *Hyalella azteca*. Sediment samples collected from the same site in WY 2025 were also toxic to *Hyalella azteca*, but no pyrethroid pesticides were detected in the sediment analysis.

8.3 Prior Conditions, Beneficial Uses, Water Quality Standards, and Impairments

The findings presented in Appendix 7 reflect prior conditions in urban creeks within Contra Costa County, the San Francisco Bay Area, and throughout California generally, as contamination of urban creeks by current-use pesticides and associated toxicity to aquatic organisms has been and continues to be a common occurrence. The designated beneficial uses of the urban creeks, therefore, are not supported by continued contamination by current-use pesticides and associated pesticide-caused toxicity, as documented in this and prior reports and studies.

The determinations of toxicity to aquatic organisms documented in this report represent apparent violations of the narrative toxicity water quality standard in the San Francisco Bay Basin Plan (SFBRWQCB 2023), as well as the narrative sediment objective and the narrative population and community ecology objective.

The Diazinon and Pesticide-Related Toxicity in Urban Creeks TMDL aims to protect aquatic organisms generally and “ensure that urban creeks meet applicable water quality standards established to protect and support beneficial uses” (SFBRWQCB 2005). The statistically significant

findings of water and sediment toxicity documented in this report, taken together with the water and sediment chemistry data showing elevated levels of pyrethroid pesticides, also arguably represent an exceedance of the TMDL's numeric target for pesticide-related toxicity, as it is clear from the chemistry data that in most cases pesticides likely "cause or contribute to the toxicity."

The instances of water column and sediment toxicity presented in this report indicate ongoing impairment of water quality, and the likely sources of the impairment are applications of pyrethroids and other pesticides within Contra Costa County watersheds. The unusual toxicity observed in the algae Selenastrum capricornutum during the WY 2025 dry weather monitoring may have been caused by elevated concentrations of one or more herbicides.

9 East County Annual Mercury Monitoring Plan for WY 2027 (C.19.d)

Provision C.19.d.iii.(1) requires East County Permittees to submit a mercury monitoring plan annually. The monitoring plan describes the annual monitoring schedule and specifies proposed sampling locations for East County methylmercury sampling required under MRP 3.0 Provision C.19.d.ii.(2).

In WY 2027, CCCWP will sample West Delta, Central Delta, and Marsh Creek subareas during the wet season and dry season to address the following monitoring questions:

a) *What are the annual methylmercury loads from the MS4 discharge to the Central Delta, Marsh Creek, and West Delta subareas?*

b) *Do methylmercury loads to each subarea meet the assigned methylmercury wasteload allocations?*

c) *Are there any MS4 design features that increase mercury methylation in the discharge?*

d) *What MS4 water quality controls have been implemented or are planned to be implemented to reduce methylmercury production and transport in the MS4 discharge?*

e) *By January 1, 2024, address whether eutrophication and low dissolved oxygen concentrations increase methylmercury in ponded areas of Marsh Creek during low flow periods (depending on the year, low flow periods can range between mid-March and mid-November), and, if so:*

    i. *Under what hydrologic or seasonal circumstances do increased methylmercury concentrations reach the Delta?*

    ii. *Are there reasonable and foreseeable management actions to ameliorate increased methylmercury concentrations?*

Sampling efforts and plans to address the above monitoring questions are presented in the East County Annual Mercury Monitoring Plan: Water Year 2027 (Appendix 8). As sampling conditions required to address the monitoring question in Provision C.19.d.ii.(2)(e) by January 1, 2024 were not present in WYs 2024 or 2025, CCCWP plans to target the Marsh Creek subarea again in WY 2026 and WY 2027 (CCCWP 2025a).

The monitoring plan provides a schedule and sample frequency sufficient to collect a minimum of eight samples annually in compliance with MRP 3.0 Provision C.19.d.ii.(2). The targeted sample frequency and schedule suggest CCCWP is on track to collect 50 samples throughout the MRP 3.0 permit term.

10 References

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Appendix 1

Low Impact Development (LID) Monitoring Report: Water Years 2023-2025

Appendix 2

Regional Trash Outfall Monitoring Report: Water Years 2024 and 2025

Appendix 3

Regional Trash Receiving Water Monitoring Report: Water Years 2024 and 2025

Appendix 4

Pollutants of Concern Integrated Monitoring Report: Water Years 2020-2025

Appendix 5

Pollutants of Concern Receiving Water Limitations Assessment Report: Update 2026

Appendix 6

Fate and Transport of Mercury and PCBs

Appendix 7

Pesticides and Toxicity Integrated Monitoring Report: Water Years 2020-2025

Appendix 8

East County Annual Mercury Monitoring Plan: Water Year 2027

Attachment A

Electronic Data Transmittal Letter dated March 31, 2026, with attached file list