Receiving Water Limitations Assessment Report – Update 2026

Submitted in compliance with Provision C.8.h.iv(2)(c) of National Pollutant Discharge Elimination System (NPDES) Permit No. CAS612008, Order No. R2-2022-0018

Submitted by

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ACRONYMS AND ABBREVIATIONS

ACCWP	Alameda Countywide Clean Water Program
BAMSC	Bay Area Municipal Stormwater Collaboration
BASMAA	Bay Area Stormwater Management Agencies Association
Basin Plan	Water Quality Control Plan for the San Francisco Bay Basin
CCCWP	Contra Costa Clean Water Program
CEDEN	California Environmental Data Exchange Network
CTR	California Toxics Rule
FIB	fecal indicator bacteria
IMR	integrated monitoring report
MP	monitoring plan
MRP	Municipal Regional Stormwater Permit
NPDES	National Pollutant Discharge Elimination System
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
POCs	pollutants of concern
P&T	pesticides and toxicity
RMC	Regional Monitoring Coalition
RMP	Regional Monitoring Program for Water Quality in San Francisco Bay
RWL	receiving water limitations
RWL MP	receiving water limitations monitoring plan
SF	San Francisco
SFBRWQCB or Regional Water Board	San Francisco Bay Regional Water Quality Control Board
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
SOP	standard operating procedure
SWAMP	California Surface Water Ambient Monitoring Program
TMDL	total maximum daily load
USEPA	United States Environmental Protection Agency
WQO	water quality objective
WY	water year

1. INTRODUCTION

This updated Receiving Water Limitations (RWL) Assessment Report was prepared collaboratively by the Alameda Countywide Clean Water Program (ACCWP), the Contra Costa Clean Water Program (CCCWP), the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP), and the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) per the Municipal Regional Permit (MRP) for urban stormwater issued by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB or Regional Water Board; Order No. R2-2022-0018). The ACCWP, CCCWP, SCVURPPP, and SMCWPPP are herein referred to as the collaborating Programs. This report fulfills the requirements of MRP Provision C.8.h.iv.(2)(c) for providing an updated Receiving Water Limitations Assessment Report with proposed monitoring to be conducted during the next permit term.

This report addresses comments provided in the Regional Water Board's Conditional Approval of the Receiving Water Limitations Assessment Report dated June 12, 2023. As documented in the letter, the collaborating Programs must:

- Include a statistical evaluation of RWL data in the March 31, 2026, Integrated Monitoring Report (IMR) required by Provision C.8.h.iv.(2)(c)
- Compare data collected for all RWL analytes to all available instream data for the same county and analyte collected during the last 10 years
- Present data distributions in tabular form, including summary statistics such as minimum, maximum, mean, median, and percentiles
- Present data distributions in graphical form, such as data density plots, histograms, box and whisker plots
- Indicate individual waterbodies and sampling locations in graphical data distributions (e.g., using color and/or symbol shape) to clearly discern RWL data
- Conduct this analysis to assess the representativeness and suitability of selected waterbodies for RWL data collection and to determine their continued use in subsequent permits

This report also addresses the Regional Water Board's July 3, 2025, comments to the collaborating Programs on their respective water year (WY) 2024 Urban Creeks Monitoring Reports, which requested the following:

- Details of the receiving water body from which water samples were collected (e.g., name and location of the water body, catchment area, outfall(s) discharging into the water body).
- A brief discussion on the RWL monitoring data, including a comparison of data with RWLs associated with the water body.

2. BACKGROUND

MRP 3.0 Provision C.8.f. requires water quality monitoring for pollutants of concern (POCs). POC monitoring must address the priority management information needs (i.e., management questions) identified in Provision C.8.f, including Management Question #6: Compliance with Receiving Water Limitations. RWL monitoring, intended to assess whether RWLs are achieved, must be conducted by each collaborating Program, with at least four samples collected during the wet season and one sample collected during the dry season.

2.1 Previously Submitted Reports

The collaborating Programs collectively developed and submitted the *Receiving Water Limitations Assessment Report* on March 31, 2023, as required by Provision C.8.h.iv.(2) of the MRP. The Receiving Water Limitations Assessment Report, herein referred to as the RWL Monitoring Plan (MP or RWL MP), describes the regional approach to RWL monitoring and provided the following information:

- Relevant water quality objectives (WQOs) against which to compare monitoring data
- Analytes in addition to those listed in Table 8.2 of MRP Provision C.8 (i.e., copper, zinc, fecal indicator bacteria) to monitor based on assessment of the potential that discharges of these analytes may result in levels in receiving waters approaching or exceeding WQOs and the basis of the determination
- Identification of waterbodies to be sampled, sampling locations within those waterbodies, and the basis for which those waterbodies were selected (i.e., watershed size, percent impervious watershed area, percent developed, presence of upstream impoundment, availability of prior water quality monitoring data)
- Sampling schedule consistent with the requirements in MRP Tables 8.1 and 8.2

On June 12, 2023, the Regional Water Board's Executive Officer issued a letter of Conditional Approval of the RWL MP (Conditional Approval Letter). The Conditional Approval Letter stated that approval of the RWL MP is subject to two conditions:

1. Inclusion of polycyclic aromatic hydrocarbons (PAHs) in the analyte list
2. Demonstration of the representativeness of the selected monitoring locations submitted with the March 2024 Urban Creeks Monitoring Report

To address the first condition, the collaborating Programs augmented the analyte list to include PAHs. To address the second condition, the collaborating Programs prepared and submitted the *Receiving Water Limitations Assessment Report Addendum: Demonstration of the Representativeness of the Selected Monitoring Locations* on March 31, 2024. The Receiving Water Limitations Assessment Report Addendum, herein referred to as the RWL MP Addendum, identified and characterized watersheds in Alameda, Contra Costa, San Mateo, and Santa Clara counties that drain to San Francisco Bay and compared them to the four selected monitoring locations. The RWL MP Addendum provided a list of creeks represented by the chosen four and a list of creeks that are not well represented, demonstrating the representativeness of the RWL monitoring locations regionally and within an individual county.

2.2 Monitored Analytes

To evaluate which analytes to include in the RWL monitoring program, the collaborating Programs accessed and compiled relevant water-quality data from the California Environmental Data Exchange Network (CEDEN) for the last decade (2010-2021). The maximum concentration of each analyte was compared with the most stringent existing water quality threshold developed and used by federal and state regulatory agencies. This data review process was modeled after the Reasonable Potential Analysis method used by NPDES permit writers to determine if pollutants require effluent limits in NPDES permits. For more details on analyte selection, see the RWL MP (BAMSC 2023).

Based on the analysis of readily available data collected from 2010 to 2021 in Bay Area creeks and channels (i.e., receiving waters), the following analytes were included in the RWL monitoring program:

- *E. coli* – applicable fecal indicator bacteria (FIB), required by MRP Provision C.8.f
- Ammonia, pH, specific conductance, temperature – ancillary parameters to calculate un-ionized ammonia
- Un-ionized Ammonia – based on Regional Water Board staff's recommendation
- Total Nitrogen – based on anticipation of new statewide criteria
- Total Phosphorus – based on anticipation of new statewide criteria
- Hardness – ancillary parameter to calculate site-specific metals WQOs
- Total Mercury – based on the comparison of data to the Water Quality Control Plan for the San Francisco (SF) Bay Basin (Basin Plan) WQOs
- Dissolved copper – required by MRP Provision C.8.f
- Dissolved zinc - required by MRP Provision C.8.f
- Dissolved lead – based on the comparison of data to Basin Plan WQOs
- PAHs – required by the June 12, 2023, Regional Water Board letter of Conditional Approval
- Polychlorinated biphenyls (PCBs) Regional Monitoring Program for Water Quality in San Francisco Bay (RMP) 40[1] – based on the comparison of data to California Toxics Rule (CTR) criteria (USEPA 2000)

Additionally, pesticides and toxicity (P&T) are included in the RWL monitoring program, consistent with the monitoring being conducted in compliance with MRP Provision C.8.g – Pesticides and Toxicity Monitoring. Refer to each collaborating Program's *Pesticides and Toxicity Monitoring Report*, a companion report submitted as part of their respective IMRs, for details on the P&T monitoring program and results.

2.3 Sampling Locations

Each of the collaborating Programs selected a single sampling location for RWL monitoring within their respective county, for a total of four sites. Sampling stations are listed in Table 1 and mapped in Figure 1. All sampling locations are above tidally influenced areas near the bottom of their respective watershed and are influenced by urban runoff. Selected watersheds range in size from 5.5 to 117 square miles, and 6.6 to 49.3 percent impervious area (20.6 to 90.2 percent developed).

[1] The RMP 40 congener list was developed by the San Francisco Estuary Institute during the early years of RMP implementation and has been used by a variety of monitoring projects in the Bay Area over the last several decades, including stormwater programs subject to MRP for a variety of efforts. A list of these 40 congeners is available at https://www.sfei.org/sites/default/files/project/Updated_DMMO_PCB_Congener_and_PAH_Analyte_Lists.pdf

Table 1 Sampling locations and associated watershed characteristics

County	Creek	Station ID	Sampling Location	Latitude Longitude	Watershed Size (sq miles)	Developed (%)	Impervious Area (%)
Alameda	Castro Valley Creek	204CVY010	N 3rd Street, Hayward (Japanese Gardens)	37.68016 -122.08059	5.5	90.2	49.3
Contra Costa	Walnut Creek	207R02615	Concord Avenue, Concord	37.97990 -122.05176	116.6	53.8	18.7
San Mateo	San Mateo Creek	204SMA020	3rd Avenue, San Mateo (Gateway Park)	37.56981 -122.31780	33.3	20.6	6.6
Santa Clara	Saratoga Creek	205SAR005	Cabrillo Avenue, Santa Clara (Bowers Park)	37.35973 -121.97336	16.7	49.4	22.5

The representativeness of the four monitoring sites was evaluated by comparing their watershed characteristics to those of other San Francisco Bay-draining watersheds across Alameda, Contra Costa, San Mateo, and Santa Clara counties, as documented in the RWL MP Addendum (BAMSC 2024). Representativeness was assessed using a quadrant-based analysis that compared watershed size to percent developed land and percent impervious area at both the regional and county scales, with median values used to define quadrant groupings to reflect watershed types in the Bay Area.

At the regional scale, three of the four monitored watersheds—Walnut Creek, San Mateo Creek, and Saratoga Creek—fell within Quadrant 4, which represents larger-than-median watersheds with lower-than-median development and imperviousness and contains a substantial proportion of Bay Area watersheds. Castro Valley Creek fell within Quadrant 2, representing smaller, more highly developed watersheds that are also common in the region. Together, the four sites span the two most populated watershed groupings.

A summary of the monitoring locations and watersheds is provided below. Maps of the individual watersheds, including outfalls discharging into the water body, are provided in Figures 2, 3, 4, and 5.

2.3.1 Castro Valley Creek (Alameda County)

Castro Valley Creek drains a 5.5-square-mile watershed that encompasses portions of unincorporated Alameda County. Castro Valley Creek is a major tributary to one of the larger watersheds within Alameda County, the 48-square-mile San Lorenzo Creek watershed. The monitoring location is near a long-term USGS gauging station, just below the confluence of Castro Valley Creek and Chabot Creek. Land use is largely suburban throughout these two catchments. Together, these two catchments are nearly fully developed, with mostly high-density residential land uses and approximately 10% open space in the area of upper Castro Valley Creek.

2.3.2 Walnut Creek (Contra Costa County)

The Walnut Creek watershed is the largest in Contra Costa County, covering 146 square miles. The Walnut Creek watershed has 309 miles of creek channels, accounting for almost a quarter of all mapped creek channels in Contra Costa County. The monitoring location is located at Concord Avenue in the City of Concord, with the upstream area comprising approximately 116.6 square miles. The cities of San Ramon, Lafayette, Walnut Creek, and Concord; the towns of Danville and Moraga; and portions of Unincorporated Contra Costa County lie partially or entirely within the

boundaries of the monitored watershed. Land uses in the Walnut Creek watershed include approximately 58% urban land, with the remaining land uses comprising agricultural, open space, and recreational areas.

2.3.3 San Mateo Creek (San Mateo County)

San Mateo Creek drains a 33.3-square mile watershed, including parts of unincorporated San Mateo County, the City of San Mateo, and the Town of Hillsborough. Runoff from the upper 88% of the watershed drains to a system of reservoirs were constructed in the late 1800s and are now owned and operated by the San Francisco Public Utilities Commission. Below the reservoirs (i.e., below the Lower Crystal Springs reservoir dam), the watershed encompasses approximately five square miles. Low and medium-density residential land uses characterize the area upstream of El Camino Real, and high-density residential and commercial land uses characterize the watershed downstream of El Camino Real. There is one main tributary in this reach, Polhemus Creek, which enters San Mateo Creek approximately 0.75 miles downstream of the dam. The monitoring location is located within Gateway Park, approximately 1 mile downstream of El Camino Real and 0.2 miles upstream of Highway 101, which marks the approximate upstream extent of the tidally influenced portion of the creek. The monitoring location is co-located with a California Surface Water Ambient Monitoring Program (SWAMP) Stream Pollution Trends (SPoT) long-term monitoring station.

2.3.4 Saratoga Creek (Santa Clara County)

Saratoga Creek drains a 17-square-mile watershed that includes parts of unincorporated Santa Clara County, the Town of Saratoga, and the Cities of Santa Clara and San Jose. Saratoga Creek, a major tributary to San Tomas Aquino Creek, flows for approximately 4.5 miles in an eastern direction through forested terrain, largely contained within Sanborn County Park. It continues for about 1.5 miles through the low-density residential foothill region of the Town of Saratoga and then for another eight miles along the alluvial plain of the Santa Clara Valley, through the cities of San Jose and Santa Clara, which are characterized by high-density residential neighborhoods. The monitoring location is in the City of Santa Clara’s Bowers Park near an elementary school and a middle school.

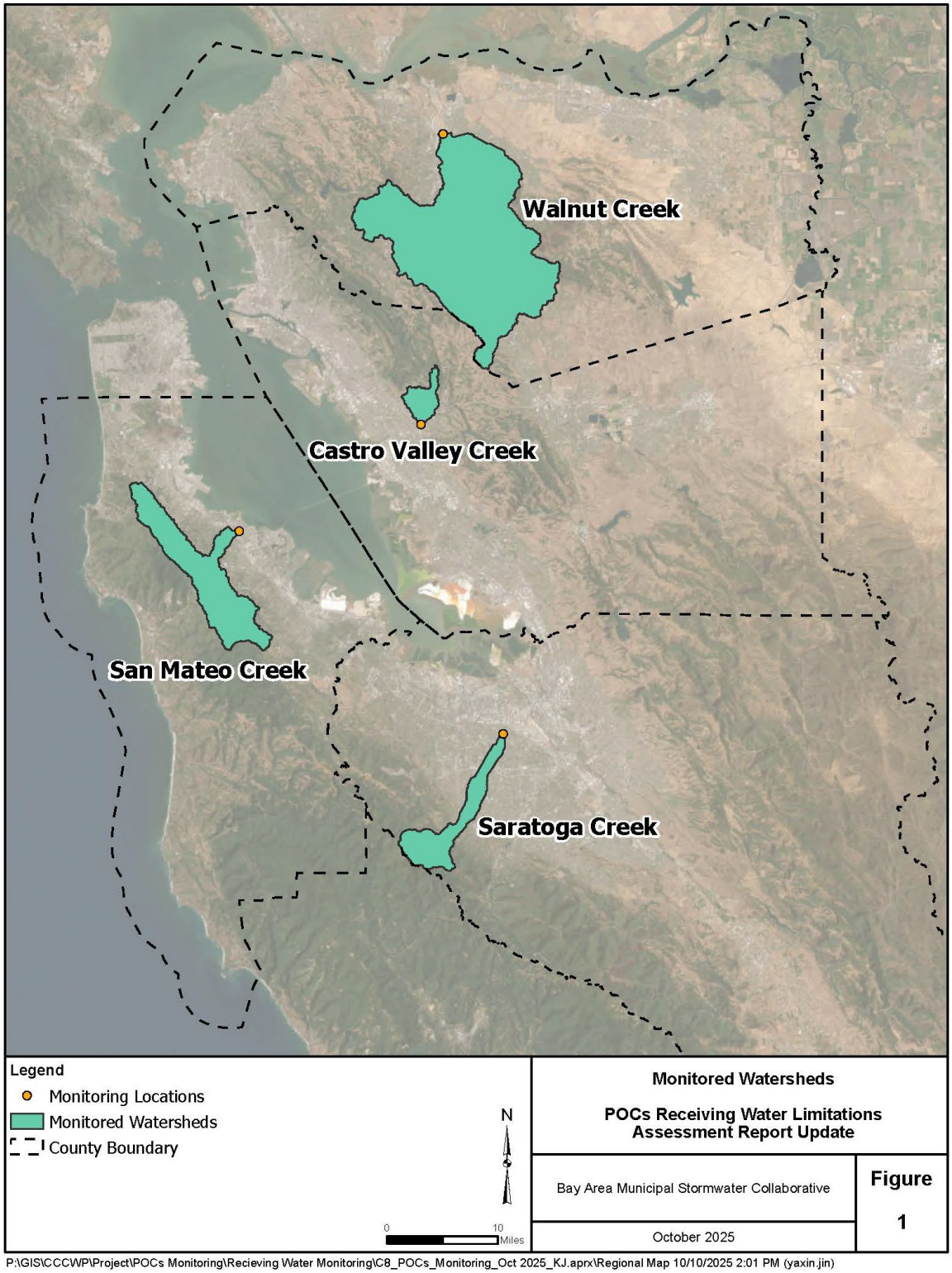

Figure 1. RWL monitoring sites and watershed areas

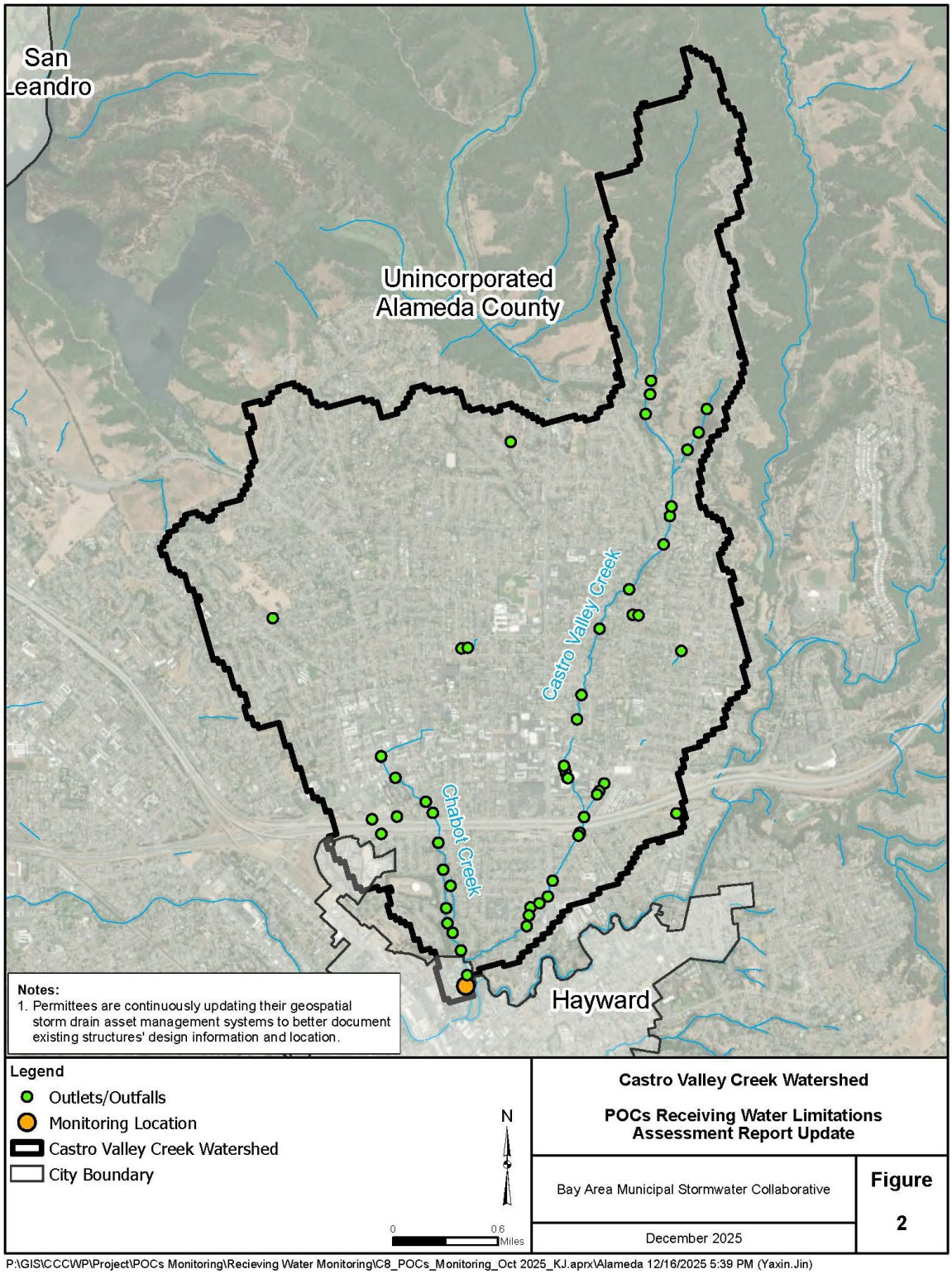

Figure 2. Castro Valley Creek watershed area (Alameda County)

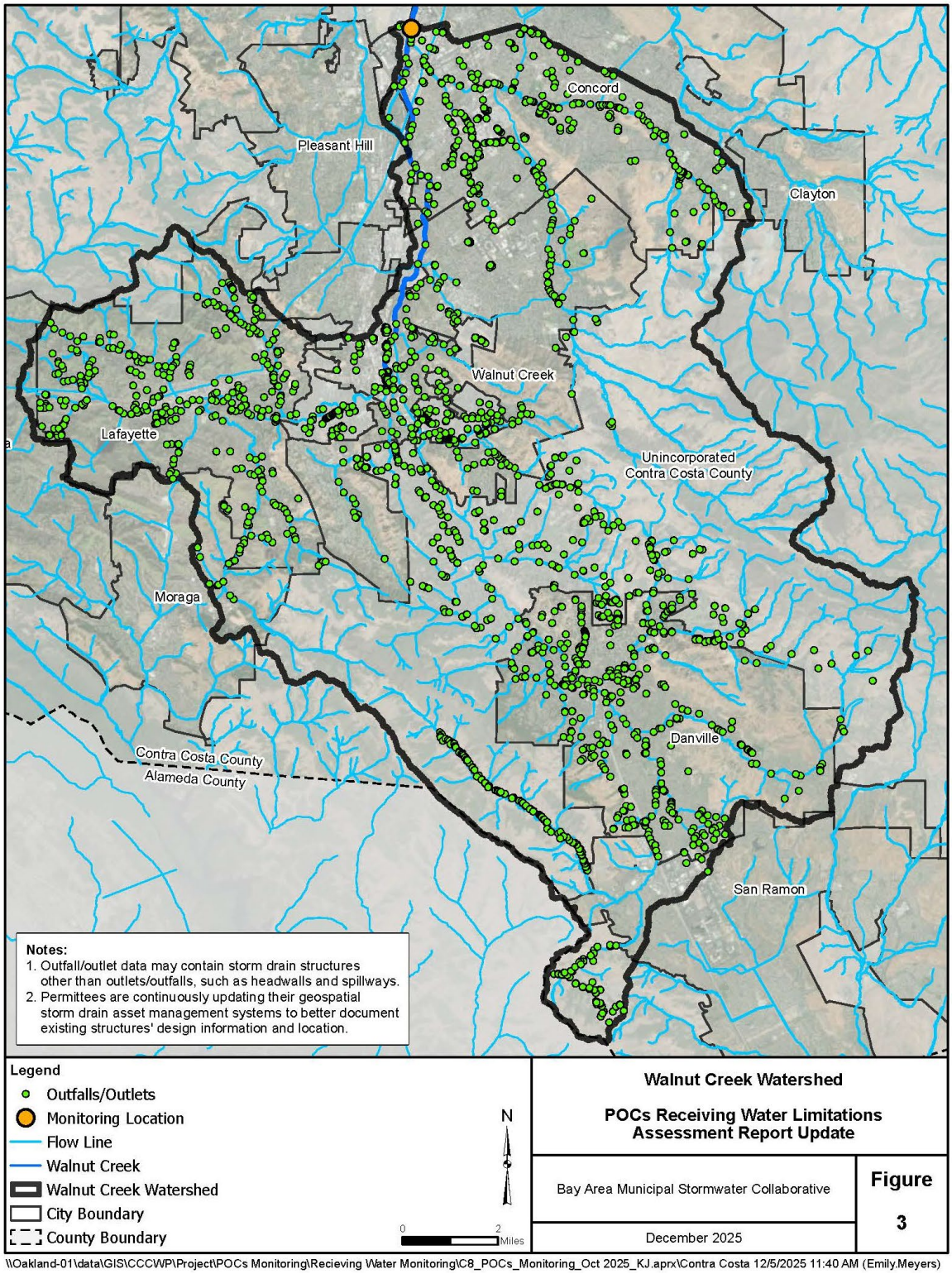

Figure 3. Walnut Creek watershed area (Contra Costa County)

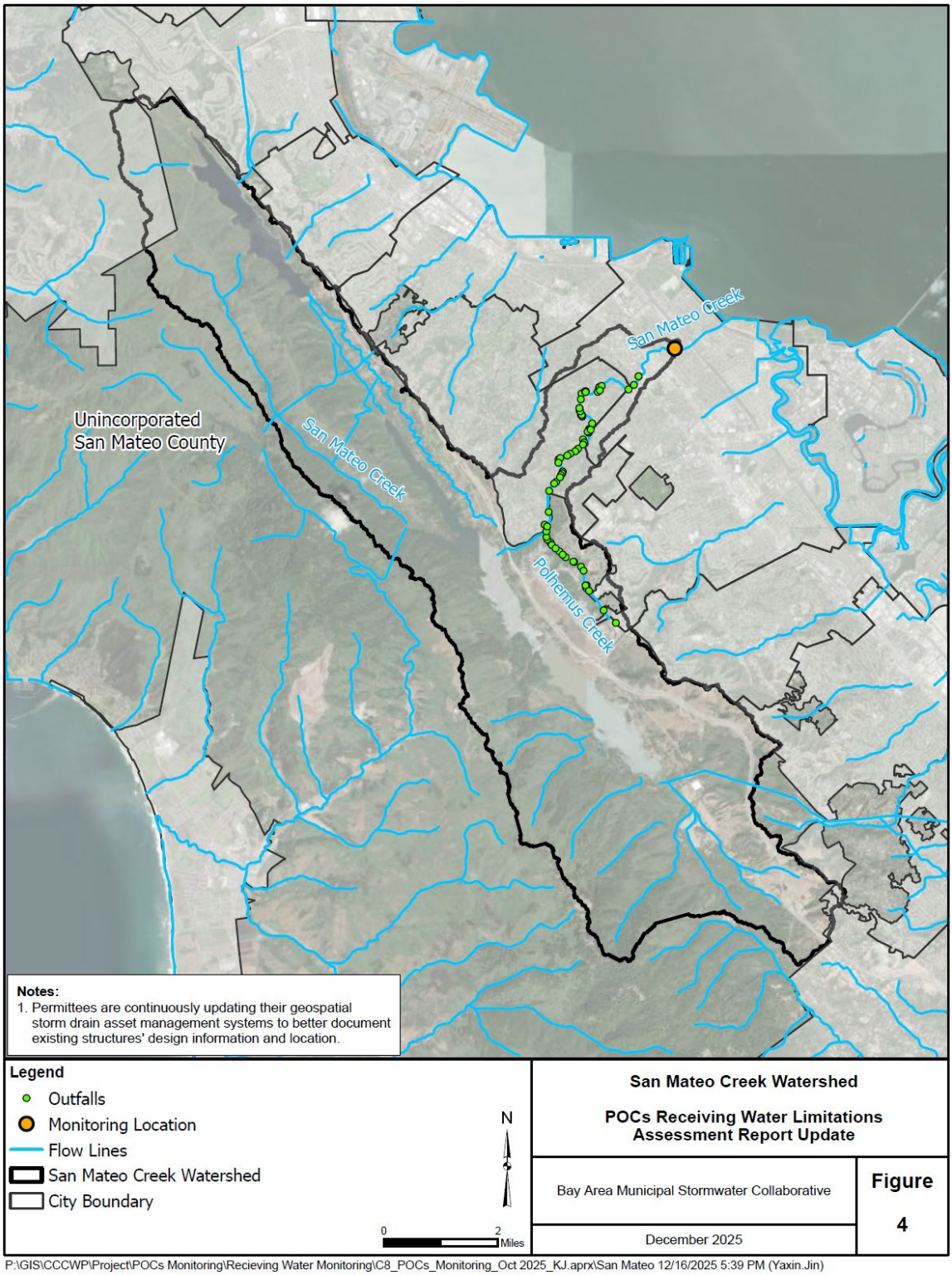

Figure 4. San Mateo Creek watershed area (San Mateo County)

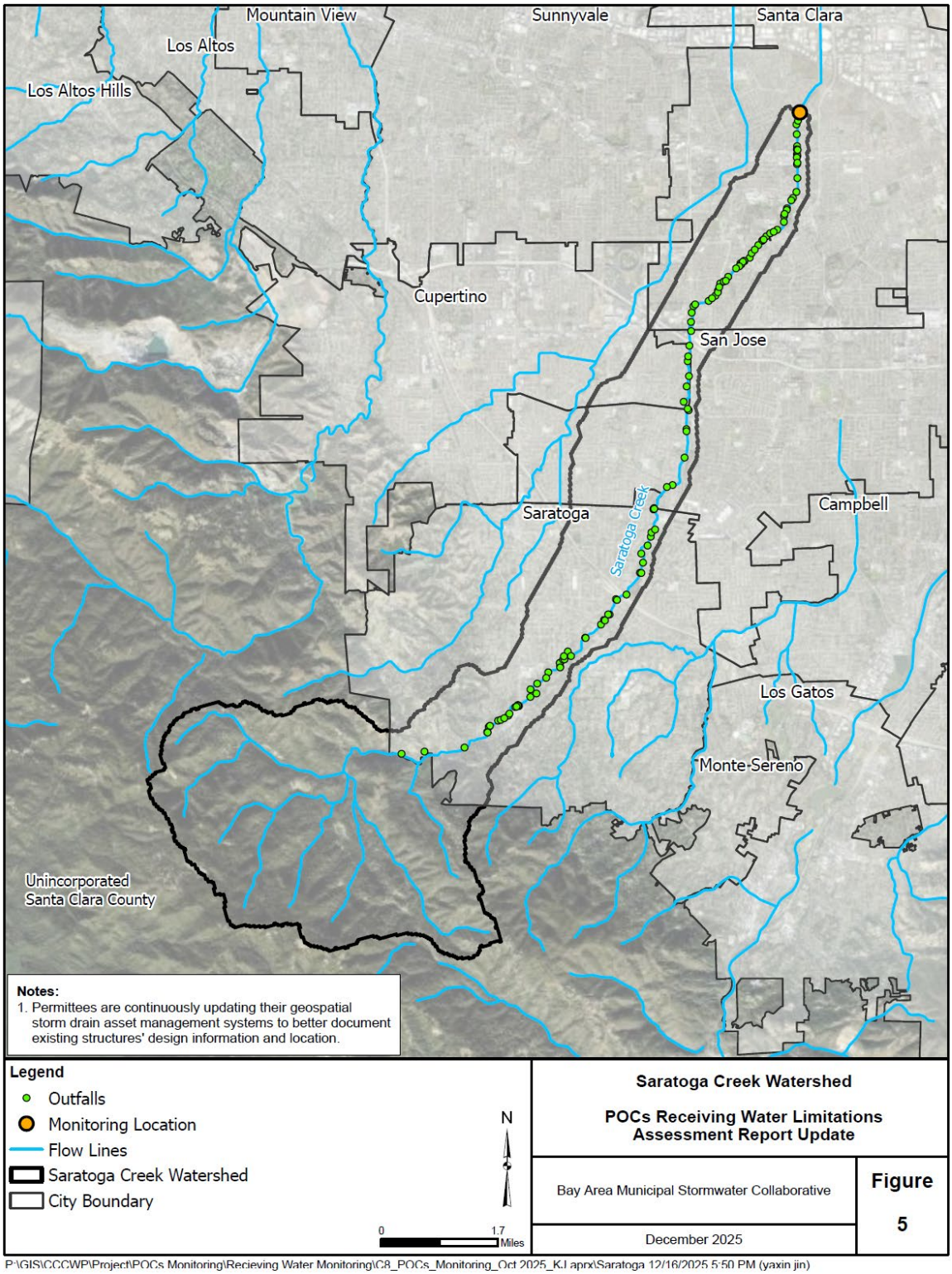

Figure 5. Saratoga Creek watershed area (Santa Clara County)

2.4 Regulatory Listings and Beneficial Uses

The Clean Water Act Section 303(d) list identifies water bodies that do not meet applicable water quality standards and require the development of total maximum daily loads (TMDLs) or alternative restoration strategies. The SF Bay Basin Plan lists beneficial uses. It provides numeric and narrative criteria for a range of water quality constituents applicable to certain receiving water bodies and groundwater basins within the San Francisco Bay region. Specific criteria are provided for the larger, designated water bodies within the area, as well as general criteria or guidelines for ocean waters, bays and estuaries, inland surface waters, and ground waters. Those waters not specifically listed (generally smaller tributaries) are assumed to have the same beneficial uses as the streams, lakes, or reservoirs to which they are tributary.

The current 303(d) listings (SWRCB 2024) and the beneficial uses relevant to the RWL-monitored creeks are shown in Tables 2 and 3, respectively. The applicable water quality criteria are described in Section 2.5.

As shown in Table 2, each of the monitored creeks is listed for pesticides and/or toxic substances for which an approved TMDL exists. MRP 3 Provision C.9 Pesticide Toxicity Control implements requirements of the TMDL for Diazinon and Pesticide-Related Toxicity for Urban Creeks in the SF Bay region. The P&T monitoring program and results are provided in each Program's companion *Pesticides and Toxicity Monitoring Report*. Two of the creeks – Castro Valley Creek and San Mateo Creek – are listed for bacteria, with a TMDL required by 2037. One creek – Saratoga Creek – is listed for trash of unknown source, which is being addressed by implementing MRP 3 Provision C.10 Trash Load Reduction.

Table 2 2024 Clean Water Act Section 303(d) listings for the monitored creeks

Creek Name	Listing	Sources	TMDL	Reference
Castro Valley Creek – Alameda County	Indicator Bacteria	Unknown	Required by 2037	
Castro Valley Creek – Alameda County	Fipronil	Urban Runoff Surface Runoff	Approved by USEPA 2007	SFBRWQCB 2005
Castro Valley Creek – Alameda County	Toxicity	Urban Runoff Surface Runoff	Approved by USEPA 2007	SFBRWQCB 2005
Saratoga Creek – Santa Clara County	Diazinon	Unknown	Approved by USEPA 2007	SFBRWQCB 2005
Saratoga Creek – Santa Clara County	Trash	Unknown	NA - Listing will be addressed by implementing Provision C.10 of the MRP	NA - Listing will be addressed by implementing Provision C.10 of the MRP
San Mateo Creek, Lower – San Mateo County	Chlordane	Unknown	Required by 2037	
San Mateo Creek, Lower – San Mateo County	Indicator Bacteria	Unknown	Required by 2037	
San Mateo Creek, Lower – San Mateo County	Pyrethroids	Urban Runoff Surface Runoff	Approved by USEPA 2007	SFBRWQCB 2005
San Mateo Creek, Lower – San Mateo County	Toxicity (sediment)[1]	Unknown	Approved by USEPA 2007	SFBRWQCB 2005
Walnut Creek – Contra Costa County	Bifenthrin	Urban Runoff Surface Runoff	Approved by USEPA 2007	SFBRWQCB 2005
Walnut Creek – Contra Costa County	Diazinon	Urban Runoff Surface Runoff	Approved by USEPA 2007	SFBRWQCB 2005
Walnut Creek – Contra Costa County	Pyrethroids	Urban Runoff Surface Runoff	Approved by USEPA 2007	SFBRWQCB 2005
Walnut Creek – Contra Costa County	Toxicity	Urban Runoff Surface Runoff	Approved by USEPA 2007	SFBRWQCB 2005

1 This waterbody was already listed for sediment toxicity in a previous listing round. Thus, this is not a new listing. The previous decision field is in error because it is referring to the previous decision for water toxicity. Now that water and sediment toxicity are combined, the current listing will be for toxicity, but it is important to keep in mind that the toxicity is for the sediment compartment.

Table 3 Beneficial uses for RWL monitored creeks

County	Waterbody	AGR	MUN	FRSH	GWR	IND	PROC	COMM	SHELL	COLD	EST	MAR	MIGR	RARE	SPWN	WARM	WILD	REC-1	REC-2	NAV
Alameda	Castro Valley Creek									E				E		E	E	E	E	
Santa Clara	Saratoga Creek	E		E	E					E						E	E	E	E	
San Mateo	San Mateo Creek			E						E			E	E	E	E	E	E	E	
Contra Costa	Walnut Creek									E			E	E	E	E	E	E	E	

AGR Agricultural Supply
COLD Cold Fresh Water Habitat
COMM Commercial and Sport Fishing
E Existing Use
EST Estuarine
FRSH Freshwater Replenishment
GWR Groundwater Recharge IND Industrial Service Supply
MAR Marine Habitat
MIGR Fish Migration
MUN Municipal and Domestic Water
NAV Navigation
PROC Industrial Process Supply
RARE Preservation of Rare and Endangered Species REC-1 Water Contact Recreation
REC-2 Non-contact Recreation
SHELL Shellfish Harvesting
SPWN Fish Spawning
WARM Warm Freshwater Habitat
WILD Wildlife Habitat

2.5 Water Quality Objectives and Thresholds

The WQOs used to evaluate the measured analytes are listed in Table 4 for the SF Bay Basin Plan and Table 5 for the California Toxics Rule (CTR). Pesticide and toxicity monitoring data are evaluated in compliance with MRP C.8.g permit requirements in the companion *Pesticide and Toxicity Monitoring Reports*. Wet weather events are compared to the acute (1-hour) criteria, and the dry weather event are compared to the chronic (4-day) criteria.

Table 4 SF Bay Basin Plan water quality objectives (freshwater) for analytes measured

Analyte	Reference[1]	Units	Acute (1-hour)	Chronic (4-day)
pH	Section 3.3.9	pH Units	6.5 – 8.5[2]	6.5 – 8.5[2]
Temperature	Section 3.3.17	°C	No applicable criteria[3]	No applicable criteria[3]
Specific Conductivity	Section 2.2.2	µS/cm	No applicable criteria[4]	No applicable criteria[3]
E. coli	Table 3-1[5]	CFU/100 mL[6]	STV < 320[7]	GM < 100[8]
Hardness as $CaCO_3$	NA	mg/L	No criteria	No criteria
Ammonia as N	Section 3.3.3	mg/L	No numeric criteria[9]	No numeric criteria[9]
Un-ionized Ammonia	Section 3.3.20[10]	mg/L	Annual Median < 0.025	Annual Median < 0.025
Nitrite as N	Section 3.3.3	mg/L	No numeric criteria[9]	No numeric criteria[9]
Nitrate as N	Section 3.3.3	mg/L	No numeric criteria[9]	No numeric criteria[9]
Total Kjeldahl Nitrogen	Section 3.3.3	mg/L	No numeric criteria[9]	No numeric criteria[9]
Total Phosphorus as P	Section 3.3.3	mg/L	No numeric criteria[9]	No numeric criteria[9]
Mercury	Table 3-4	ug/L	No applicable criteria[11]	0.025[12]
Copper	Table 3-4	ug/L	Variable (hardness-based)[13]	Variable (hardness-based)[13]
Lead	Table 3-4	ug/L	Variable (hardness-based)[13]	Variable (hardness-based)[13]
Zinc	Table 3-4	ug/L	Variable (hardness-based)[13]	Variable (hardness-based)[13]

PCBs and PAHs Criteria in CTR only; see Table 5 below

1 San Francisco Bay Basin Plan, Chapter 3: Water Quality Objectives (updated through July 22, 2024).

2 Controllable water quality factors shall not cause changes greater than 0.5 units in normal ambient pH levels.

3 The natural receiving water temperature of inland surface waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. The temperature of any cold or warm freshwater habitat shall not be increased by more than 5°F (2.8°C) above natural receiving water temperature.

4 SF Bay Basin Plan includes a standard applicable to waters designated as MUN. As shown in Table 3, none of the monitored creeks are designated with a MUN beneficial use.

5 For water contact recreation beneficial use and based on a minimum of five consecutive samples equally spaced over a 30-day period. As shown in Table 3, all monitored creeks are designated as water contact recreation beneficial use.

6 *E. coli* WQOs are given in units of colony forming units per 100 milliliters (CFU/100 mL); however, most laboratory methods present results in units of most probable number of colony forming units per 100 mL (MPN/100 mL). The two units are generally considered interchangeable.

7 STV = statistical threshold value; STV shall not be exceeded by more than 10% of the samples collected in a calendar month.

8 GM = geometric mean

9 Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Changes in chlorophyll a and associated phytoplankton communities follow complex dynamics that are sometimes associated with a discharge of biostimulatory substances. Irregular and extreme levels of chlorophyll or phytoplankton blooms may indicate exceedance of this objective and require investigation.

10 Calculated using Emerson method (Emerson et al. 1975)

11 The acute objective of 2.4 ug/L is applicable to mercury in Walker Creek and Soulajule Reservoir and their tributaries; and in waters of the Guadalupe River Watershed, except Los Gatos Creek and its tributaries Upstream of Vasona Dam, Lake Elsman, Lexington Reservoir, and Vasona Lake (Table 3-4A of the Basin Plan) and thus not applicable to the monitored watersheds.

12 Part 2 of "Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California —Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions (Statewide Mercury Provisions)," Section III.D.3
https://www.waterboards.ca.gov/water_issues/programs/mercury/docs/hg_prov_final.pdf

13 Hardness-based criteria are presented with the RWL results in Table 8 of this report.

Table 5 CTR water quality criteria for analytes measured

Analyte	Reference	Units	CTR Water Quality Criteria
Total PCBs[1]	Table 1 to Paragraph (b)(1)[2]	ug/L	No applicable criteria[3,4]
Acenaphthene	Table 1 to Paragraph (b)(1)[2]	ug/L	No applicable criteria[4]
Anthracene	Table 1 to Paragraph (b)(1)[2]	ug/L	No applicable criteria[4]
Benz(a)anthracene	Table 1 to Paragraph (b)(1)[2]	ug/L	No applicable criteria[4]
Benzo(a)pyrene	Table 1 to Paragraph (b)(1)[2]	ug/L	No applicable criteria[4]
Benzo(b)fluoranthene	Table 1 to Paragraph (b)(1)[2]	ug/L	No applicable criteria[4]
Benzo(k)fluoranthene	Table 1 to Paragraph (b)(1)[2]	ug/L	No applicable criteria[4]
Chrysene	Table 1 to Paragraph (b)(1)[2]	ug/L	No applicable criteria[4]
Dibenz(a,h)anthracene	Table 1 to Paragraph (b)(1)[2]	ug/L	No applicable criteria[4]
Fluoranthene	Table 1 to Paragraph (b)(1)[2]	ug/L	No applicable criteria[4]
Fluorene	Table 1 to Paragraph (b)(1)[2]	ug/L	No applicable criteria[4]
Indeno(1,2,3-c,d)pyrene	Table 1 to Paragraph (b)(1)[2]	ug/L	No applicable criteria[4]
Pyrene	Table 1 to Paragraph (b)(1)[2]	ug/L	No applicable criteria[4]
Other PAHs (13 compounds)	NA	ug/L	No criteria
Total PAHs (25 compounds)	NA	ug/L	No criteria

1 PCBs analyzed in this study include the RMP 40 congeners (see Section 2.2)

2 40 CFR Chapter I Subchapter D Part 131 Subpart D Section 131.38 https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-131/subpart-D/section-131.38#p-131.38(b)(1)

3 The freshwater continuous concentration of 0.014 ug/L pertains to the sum of seven aroclors (1242, 1254, 1221, 1232, 1248, 1260, 1016) and thus not applicable to this study, which included analysis of the RMP 40 congeners.

4 Criteria listed for Human Health for Consumption of Organisms Only. However, these criteria only apply to waterbodies designated as COMM or SHELL beneficial uses. None of the monitored waterbodies are designated as COMM or SHELL, as shown in Table 3, and thus the Human Health for Consumption of Organisms Only criteria are not applicable.

3. RWL MONITORING

The collaborating Programs completed five of five sampling events required for the MRP 3 permit term during WY 2024 and WY 2025, as described in the RWL MP. Three wet season events and one dry season event were sampled in WY 2024. The fourth and final wet season event was sampled in WY 2025. RWL monitoring fulfills POCs Monitoring Type 6, as described in MRP 3 Table 8.1 (POCs Monitoring Methods) and Table 8.2 (POC Monitoring Parameters, Effort and Type). Monitoring Type 6 is described as:

> *Monitoring in receiving waters to assess compliance with RWLs. Monitoring methods shall include:*
>
> - *Collection and analysis of analytes during the wet season in receiving waters (i.e., creeks and rivers that flow to San Francisco Bay) influenced by urban stormwater runoff.*
> - *Collection and analysis of analytes during the dry season in receiving waters (i.e., creeks and rivers that flow to San Francisco Bay) influenced by dry season urban runoff.*
> - *Sampling locations for RWLs assessment monitoring shall be spatially and temporally representative of the sampled waterbody. Sampled waterbodies shall be representative of the range of receiving waterbody types.*

The RWL sample event rainfall characteristics are provided in Table 6. For each event and location, the antecedent dry periods, storm start, and end dates, rainfall durations, and total rainfall amount are provided. The data reflects variability in rainfall amounts and durations across different events and locations.

Table 6 RWL sample event rainfall characteristics

Sample Event Characteristic	Wet Season Event 1 11/18/23	Wet Season Event 2 12/20/23	Wet Season Event 3 02/20/24	Dry Season Event 1 07/09/24	Wet Season Event 4 02/05/25
Antecedent dry period (days)[1]	11	11	2.7	66	2.5
Storm Start Date	11/17/23	12/17/23	02/17/24	not applicable	02/04/25
Storm End Date	11/18/23	12/20/23	02/20/24	not applicable	02/04/25
Rainfall Duration (hrs)	17	71	86	not applicable	20
Total Rainfall (inches)[2]	0.59	2.71	2.53	not applicable	1.60
Antecedent dry period (days)[1]	12	11	2.5	66	1.4
Storm Start Date	11/17/23	12/17/23	02/17/24	not applicable	02/04/25
Storm End Date	11/18/23	12/20/23	02/20/24	not applicable	02/04/25
Rainfall Duration (hrs)	21	75	84	not applicable	17
Total Rainfall (inches)[3]	0.42	1.53	1.63	not applicable	1.51
Antecedent dry period (days)[1]	12	11	2.6	66	1.3
Storm Start Date	11/17/23	12/17/23	02/17/24	not applicable	02/04/25
Storm End Date	11/18/23	12/20/23	02/20/24	not applicable	02/04/25
Rainfall Duration (hrs)	18	61	93	not applicable	17
Total Rainfall (inches)[4]	0.63	2.45	1.80	not applicable	1.59
Antecedent dry period (days)[1]	236	29	2.5	66	31.7
Storm Start Date	11/17/23	12/17/23	02/17/24	not applicable	02/04/25
Storm End Date	11/18/23	12/20/23	02/20/24	not applicable	02/04/25
Rainfall Duration (hrs)	12	70	85	not applicable	25

Sample Event Characteristic	Wet Season Event 1 11/18/23	Wet Season Event 2 12/20/23	Wet Season Event 3 02/20/24	Dry Season Event 1 07/09/24	Wet Season Event 4 02/05/25
Total Rainfall (inches)[5]	0.31	1.46	0.67	not applicable	0.75

1 Defined as no event exceeding 0.1 inch of cumulative rainfall over a 24-hour period

2 Rainfall data compiled from ACFCWCD gauge AC #25 at San Miguel (02G0019)

3 Rainfall data compiled from Weather Underground stations KCACONCO235 and KCACONCO143

4 Rainfall data compiled from Weather Underground station KCASANMA342

5 Rainfall data compiled from Santa Clara Valley Water District gauge (sensor #6131)

The report sections below provide further details on the sampling and laboratory methods, quality assurance/quality control program, and the sample results.

3.1 Sampling Detail

All water quality samples for analysis of RWL constituents were collected consistent with methods identified in the Bay Area Stormwater Management Agencies Association (BASMAA) Regional Monitoring Coalition (RMC) Standard Operating Procedures (BASMAA 2016) SOP FS-2, Manual Collection of Water Samples for Chemical Analysis, Bacteriological Analysis, and Toxicity Testing. All samples were collected via manual grabs.

3.2 Laboratory Methods

All water quality inorganic, nutrient, and fecal indicator bacteria samples were analyzed by Caltest Analytical in Napa, California. PAHs were analyzed by Physis in Anaheim, California. PCBs were analyzed by Enthalpy Analytical in El Dorado Hills, California. The analytical test methods, reporting limits, and holding times are provided in Table 7.

Table 7 RWL analytical tests, methods, reporting limits, and holding times

Water Analytical Test	Method	Reporting Limit	Holding Time
E. coli	SM 9223 B	1.0 MPN/100 mL	8 hours
Hardness as $CaCO_3$	SM 2340 C	5.0 mg/L	6 months
Ammonia as N	SM 4500-NH3 C-11	0.10 mg/L	28 days
Nitrate as N	EPA 300.0	0.10 mg/L	48 hours
Nitrite as N	SM 4500-NO2 B-00/-11 (LL)	0.005 mg/L	48 hours
Total Kjeldahl Nitrogen	SM 4500-NH3 C-11	0.10 mg/L	28 days
Total Phosphorus as P	SM 4500-P B/F-11	0.10 mg/L	28 days
Total Mercury	EPA 1631E	0.0005 ug/L	6 months following acidification
Dissolved Copper	EPA 200.8	0.50 ug/L	Filter immediately, 6 months following acidification
Dissolved Lead	EPA 200.8	0.25 ug/L	Filter immediately, 6 months following acidification
Dissolved Zinc	EPA 200.8	1.0 ug/L	Filter immediately, 6 months following acidification
PAHs	EPA 625.1	0.005 ug/L	7 days to extraction, 14 to analyze
PCBs (RMP 40 congeners)1	EPA 1668C	10 - 40 pg/L2	1 year until extraction, 1 year after extraction to analyze

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 A range is given for the PCB reporting limits due to varying values for the individual PCB congeners.

3.3 Statement of Data Quality

The quality assurance/quality control (QA/QC) programs implemented by each of the collaborating Programs covering all aspects of POCs monitoring is provided within their respective 2026 IMR POCs monitoring reports.

3.4 Sampling Results

RWL monitoring results for each location are presented in Table 8. Results are compared against the applicable criteria provided above in Table 4 and Table 5.

Table 8 RWL monitoring results

Analyte	Units	204CVY01011/ 18/23 Wet 1	204CVY01012/ 20/23 Wet 2	204CVY01002/ 20/24 Wet 3	204CVY01002/ 05/25 Wet 4	204CVY01007/ 09/24 Dry	207R02615 11/18/23 Wet 1	207R02615 12/20/23 Wet 2	207R02615 02/20/24 Wet 3	207R02615 02/05/25 Wet 4	207R02615 07/09/24 Dry	204SMA020 11/18/23 Wet 1	204SMA020 12/20/23 Wet 2	204SMA020 02/20/24 Wet 3	204SMA020 02/05/25 Wet 1 4	204SMA020 07/09/24 Dry	205SAR005 11/18/23 Wet 1	205SAR005 12/20/23 Wet 2	205SAR005 02/20/24 Wet 3	205SAR005 02/05/25 Wet 4	205SAR005 07/09/24 Dry
pH	pH Units	7.32	7.69	8.18	8.01	7.89	8.00	7.69	7.92	8.09	**8.55**	7.56	8.1	7.83	8.04	8.24	7.25	7.92	7.99	8.06	8.27
Temperature	°C	15.8	13.1	13.2	10.8	19.1	15.5	13.1	12.9	9.5	18.3	15.2	13.6	12.8	10.6	17.7	15.8	13.5	12	8.5	19.8
Specific Conductivity	µS/cm	155	94.3	602	587	880	765	317	495	469	1,091	200	141	348	322	291	195	109	229	278	1193
E. coli	MPN/ 100 mL	***>2419.6***	***>2419.6***	***630***	***>2419.6***	***>2419.6***	***>2419.6***	***>2419.6***	***>2419.6***	***>2419.6***	***1413.6***	***>2419.6***	***>2419.6***	***387.3***	***866.4***	***686.7***	***>2419.6***	***>2419.6***	165.8	***579.4***	***517.2***
Hardness as $CaCO_3$	mg/L	56	42	212	210	260	272	118	188	230	360	86	64	138	122	108	76	82	106	112	570
Ammonia as N	mg/L	0.19	0.25	0.099	0.28	0.14	<0.040	0.26	0.24	0.40	0.096J	<0.04	0.18	0.11	0.21	0.08J	<0.04	0.39	0.08J	0.2	0.09J
Un-ionized Ammonia[1]	mg/L	0.001	0.003	0.003	0.008	0.003	NC	0.003	0.005	0.008	0.011	NC	0.005	0.002	0.004	0.004	NC	0.008	0.002	0.004	0.006
Nitrite as N	mg/L	0.018	0.010	0.0053	0.015	0.013	0.0190	0.0067	0.0055	0.0120	0.0120	0.0190	0.0050	<0.0020	0.002J	0.0020J	0.0220	0.0027J	<0.0020	0.0030J	0.0130
Nitrate as N	mg/L	0.58	0.74	2.6	5.5	1.5	0.40	0.33	0.52	1.1	0.23	0.20	0.44	0.18	0.31	0.12	0.43	0.13	0.19	0.51	1.20
Total Kjeldahl Nitrogen	mg/L	1.3	0.72	0.94	1.2	0.8	1.1	0.58	1.4	3.2	0.47	0.91	1.10	0.73	1.25	0.51	1.4	1.20	0.90	1.40	2.10
Total Phosphorus as P	mg/L	0.20	0.20	0.18	0.25	0.14	0.33	0.33	0.34	1.4	0.17	0.25	0.29	0.06	0.08	0.03	0.34	0.49	0.31	0.22	0.02
Mercury	µg/L	0.0036	0.0077	0.0068	0.007	0.002	0.0045	0.011	0.019	0.077	0.002	0.0042	0.016	0.006	0.0043	0.0013	0.002	0.037	0.052	0.020	0.001
Copper *(criteria)*[2]	µg/L	6.8 *(7.8)*	4.0 *(5.9)*	3.1 *(27.3)*	4.3 *(27.0)*	1.8 *(20.3)*	2.1 *(34.5)*	3.1 *(15.7)*	3.0 *(24.4)*	3.4 *(29.5)*	0.89 *(26.8)*	4.2 *(12)*	**6.6** *(6.1)*	2.1 *(18)*	3.4 *(16)*	1.6 *(39.6)*	5.1 *(10)*	2.5 *(11)*	1.0 *(18)*	1.4 *(15)*	0.6 *(39.6)*
Lead *(criteria)*[2]	µg/L	0.30 *(39.0)*	0.28 *(27.1)*	0.14 *(212.5)*	0.12 *(209.9)*	0.071 *(10.7)*	0.12J *(291.8)*	0.2J *(100.8)*	<0.07 *(182.4)*	<0.07 *(235.7)*	<0.07 *(16.3)*	0.19J *(67)*	0.25 *(46)*	0.12J *(128)*	0.19J *(105)*	<0.07 *(3.5)*	0.29 *(58)*	0.23J *(63)*	<0.07 *(88)*	0.08J *(94)*	<0.07 *(29.2)*
Zinc *(criteria)*[2]	µg/L	19 *(71.7)*	17 *(56.2)*	7.0 *(221.5)*	9.1 *(219.7)*	2.1 *(265.5)*	4.4 *(273.6)*	9.7 *(134.8)*	2.4 *(200.5)*	1.4 *(237.3)*	<0.78 *(349.7)*	2.4 *(103)*	5.4 *(80)*	1.6 *(154)*	2.3 *(139)*	0.83J *(126)*	12 *(93)*	6.9 *(99)*	<0.78 *(123)*	0.9 J *(129)*	<0.78 *(516)*
Total PAHs[3,4]	µg/L	0.056	1.006	0.013	0.010	0.067	0.056	0.280	0.045	0.157	0.003	0.061	0.276	0.020	0.017	0.003	0.045	0.549	0.165	0.056	0.003
Total RMP 40 PCB Congeners[3]	pg/L	619	1,606	356	655	865	500	1,407	645	1,660	41.2	927	1,810	280	209	98	175	3,855	254	112	ND[5]

Values in ***Bold Italics*** exceed applicable water quality criteria, as presented in Table 4 and Table 5.

1 Calculated using Emerson method (Emerson et al. 1975)

2 Dissolved metals in freshwater criteria are calculated using a hardness-based equation. Values reported in italicized parentheticals are applicable hardness-based water quality criteria by event. For wet weather events, 1-hour (acute) criterion are applied, and for the dry weather event, 4-day (chronic) criterion is applied.

3 Refer to electronic data deliverables (available from CEDEN) for the full list of individual PAH compound and PCB congener concentrations.

4 Individual PAH criterion are variable by compound. All individual PAH compound results were compared to applicable water quality criterion, with no value exceeding water quality criterion except for chrysene at station 205SAR005 during the Wet 2 event.

5 All PCB congeners were below the method detection limit.

> *E. coli* concentration exceeds the associated upper limit of the test

< Analyte not detected at or above the associated method detection limit

J	Analyte was detected; value is considered an estimate since it falls between the method detection limit and the reporting limit
MPN	most probable number
NC	Un-ionized ammonia value is not calculatable due to ammonia value not detected at or above the method detection limit
ND	Not detected at or above the method detection limit

4. DATA ANALYSIS AND DISCUSSION

The Regional Water Board's Conditional Approval of the RWL MP required Permittees to compare data collected for all RWL analytes to all available data for the same county and analyte collected during the last 10 years. To conduct this analysis, the collaborating Programs accessed and compiled relevant water-quality data for the monitored parameters from CEDEN over the last decade (2015-2024). The Programs then reviewed the compiled data on a county-by-county basis to eliminate non-relevant data points (e.g., monitoring at treatment facilities, collected in subtidal areas, associated with "field measurements", and uncertain data quality). The resulting dataset comprised approximately 4,800 data points. It included E. coli, nutrients (ammonia as N, nitrate as N, nitrite as N, total Kjeldahl nitrogen, and phosphorus), metals (dissolved copper, dissolved lead, dissolved zinc, and total mercury), and PCBs. There were no applicable PAH data in CEDEN over the last decade. CEDEN data, similar to the RWL data, is comprised of both wet and dry season results. However, the CEDEN dataset does not contain information on storm conditions and all RWL wet season samples were collected during or immediately following storm events. Many analytes targeted by the RWL program are typically elevated during storms. Because CEDEN does not indicate whether samples were collected during storm events, wet season RWL samples may not be directly comparable or could reasonably be expected to show higher concentrations than CEDEN wet season samples.

Statistical comparisons between the RWL and CEDEN data were conducted using box plots and tabular summaries. For statistical analysis, non-detects in the RWL and CEDEN data were set to zero. Box plot comparisons for all counties combined and for individual counties are provided in Appendix A and Appendix B, respectively, and discussed below. Box plot figures for all analytes (e.g., nitrate as N) or analyte groups (e.g., total PCBs) show the interquartile range (shaded box, 25th percentile at the bottom of the box and 75th percentile at the top), the median (line within the box), whiskers representing the minimum and maximum values within 1.5 times the interquartile range and outliers (white dots). Tables summarizing the number of RWL and CEDEN non-detects and the number of CEDEN outliers for each analyte are also provided in Appendix A. Individual PAH compounds and PCB congeners were considered unique for the non-detect summary but were summed for each sample event at each location in the statistical box plot comparison. In Table 8, the RWL results shown in bold exceeded the WQOs listed Table 4 and Table 5.

4.1 Water Quality Data Evaluation - All Counties Combined

The results presented in Table 8 and the regional box plots, provided in Appendix A, show the following tendencies based on pollutant type:

- Nutrients: RWL results did not exceed the applicable WQOs and were generally within the CEDEN interquartile range. Concentrations of ammonia and phosphorous were frequently above the CEDEN 75th percentile concentration and concentrations of other nutrients were occasionally above the CEDEN 75th percentile concentration.
- *E. coli*: RWL results consistently exceeded the applicable WQOs and were frequently above the CEDEN 75th percentile concentration.
- Metals: RWL results exceeded the applicable WQO on one occasion for dissolved copper at San Mateo Creek on December 20, 2023 (the measured concentration of 6.6 µg/L exceeded the hardness-based WQO of 6.1 µg/L). Other RWL dissolved metal results were frequently above the CEDEN 75th percentile concentration and RWL total mercury results were occasionally above the CEDEN 75th percentile concentration.

- PCBs: RWL results did not exceed the applicable WQO and were consistently near or below the CEDEN 25th percentile concentration.

4.2 Water Quality Data Evaluation - Individual Counties

The results presented in Table 8 and box plots for each analyte by county are provided in Appendix B and discussed below:

- Alameda County: The Castro Valley Creek watershed upstream of the sampling point is a small (5.5 square miles) and highly urbanized (90.2% developed, 49.3% impervious) watershed. RWL results showed *E. coli* levels that consistently exceeded the applicable WQO. There were occasional instances of nutrients and frequent instances of dissolved metals above the CEDEN 75th percentile, but no WQO exceedances.

- Contra Costa County: The Walnut Creek watershed upstream of the sampling point is a large (116.6 square miles) watershed with moderate development (53.8% developed, 18.7% impervious). RWL results show *E. coli* levels that consistently exceeded the applicable WQO. There were frequent instances of nutrients above the CEDEN 75th percentile, but no WQO exceedances. There were no CEDEN data for dissolved copper, zinc, or lead in Contra Costa County.

- San Mateo County: The San Mateo Creek watershed upstream of the sampling point is a moderate-sized (33.3 square miles) and less developed watershed (20% developed, 6.6% impervious) overall; however, the watershed downstream of the Crystal Springs Reservoir dam is small (approximately 4 square miles) with moderate development (approximately 38% impervious). RWL results show *E. coli* levels that consistently exceeded the applicable WQO. The measured dissolved copper concentration of 6.6 µg/L exceeded the applicable hardness-based WQO of 6.1 µg/L on one occasion (wet season Event 2 on December 20, 2023). Other RWL results for nutrients were occasionally above the CEDEN 75th percentile, but there were no WQO exceedances. All 10 CEDEN results for dissolved lead in San Mateo County were non-detect.

- Santa Clara County: The Saratoga Creek watershed upstream of the sampling point is 16.7 square miles with mixed development (49.4%, 22.5% impervious). RWL results show *E. coli* levels that exceeded the applicable WQO for four of the five sampled events. *E. coli* concentrations did not exceed the WQO for the wet season Event 3, collected February 20, 2024, and three of the five events were below the CEDEN 75th percentile concentration. Other RWL results for phosphorus and total Kjeldahl nitrogen were frequently above the CEDEN 75th percentile, and for some metals, were occasionally above the CEDEN 75th percentile but did not exceed the WQOs. All 13 CEDEN results for dissolved lead in Santa Clara County were non-detect.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This update to the Receiving Water Limitations Assessment Report summarizes RWL monitoring conducted during WY 2024 and WY 2025 and evaluates the results relative to applicable WQOs and available instream data compiled from CEDEN. Across the four monitored creeks, *E. coli* concentrations consistently exceeded applicable WQOs except for one wet season sample collected at Saratoga Creek. Nutrients, metals, PAHs, and PCBs did not exceed applicable criteria,

except for one exceedance of the dissolved copper criterion observed at San Mateo Creek during one wet weather event and one exceedance of the chrysene (a PAH) criterion observed at Saratoga Creek during one wet weather event. For many analytes, RWL concentrations were frequently higher than the upper quartile of the CEDEN dataset. These findings provide context for consideration of RWL monitoring in future permit terms.

5.2 Proposed Monitoring for Next Permit Term

The collaborating Programs anticipate that the POCs RWL monitoring program will continue into the next permit term. If directed by the Regional Water Board, the Programs will consider selecting new sites for monitoring during MRP 4, with the location informed by the representativeness analysis outlined in the RWL MP Addendum (BAMSC 2024). During MRP 4 discussions on Provision C.8, the collaborating Programs will engage with Regional Water Board staff to discuss whether changes to the analyte list are needed.

6. REFERENCES

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APPENDIX A
RWL Statistical Evaluation
All Counties Combined

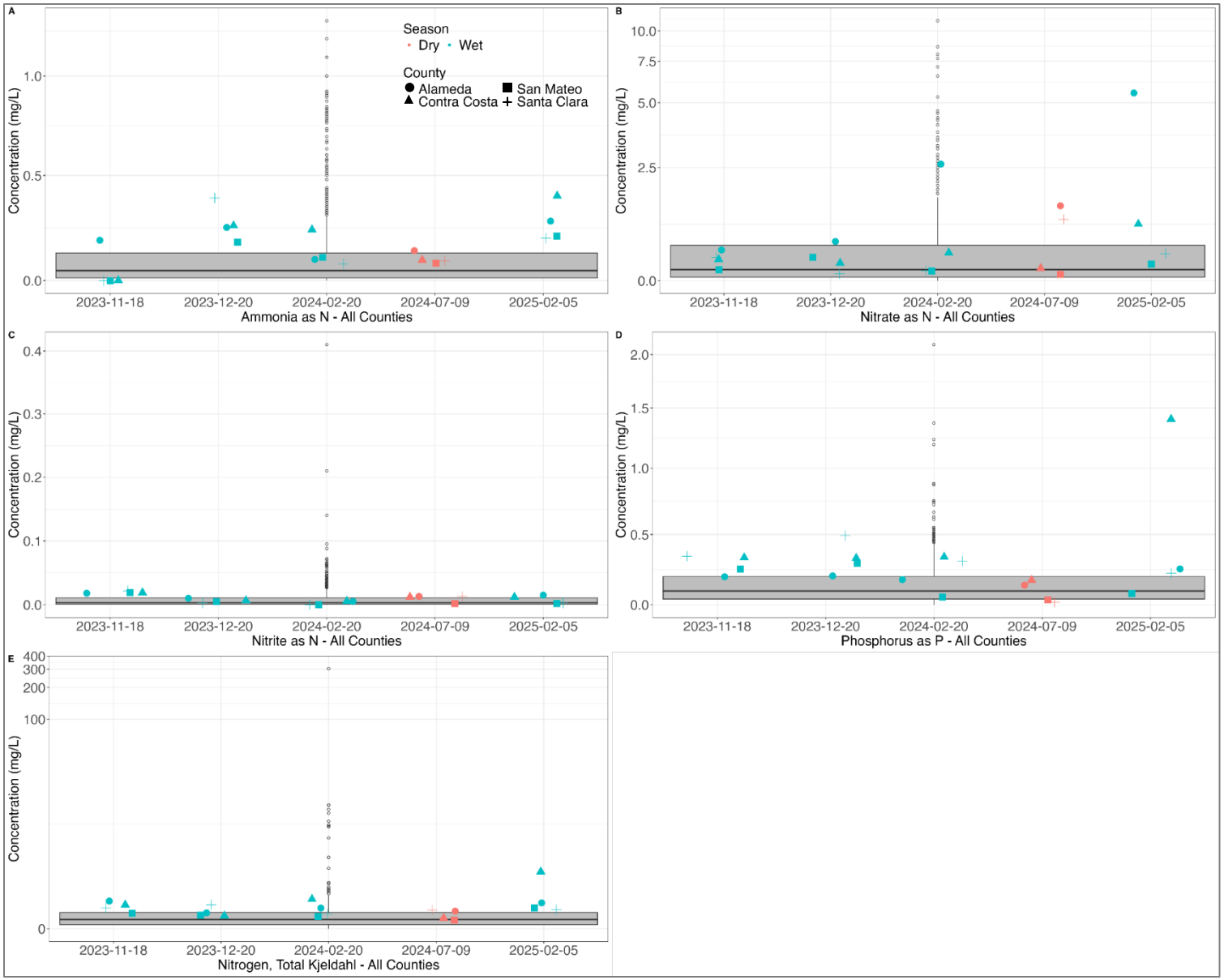

Figure A-1. Comparison of nutrient analyte concentrations across Alameda, Contra Costa, San Mateo and Santa Clara counties

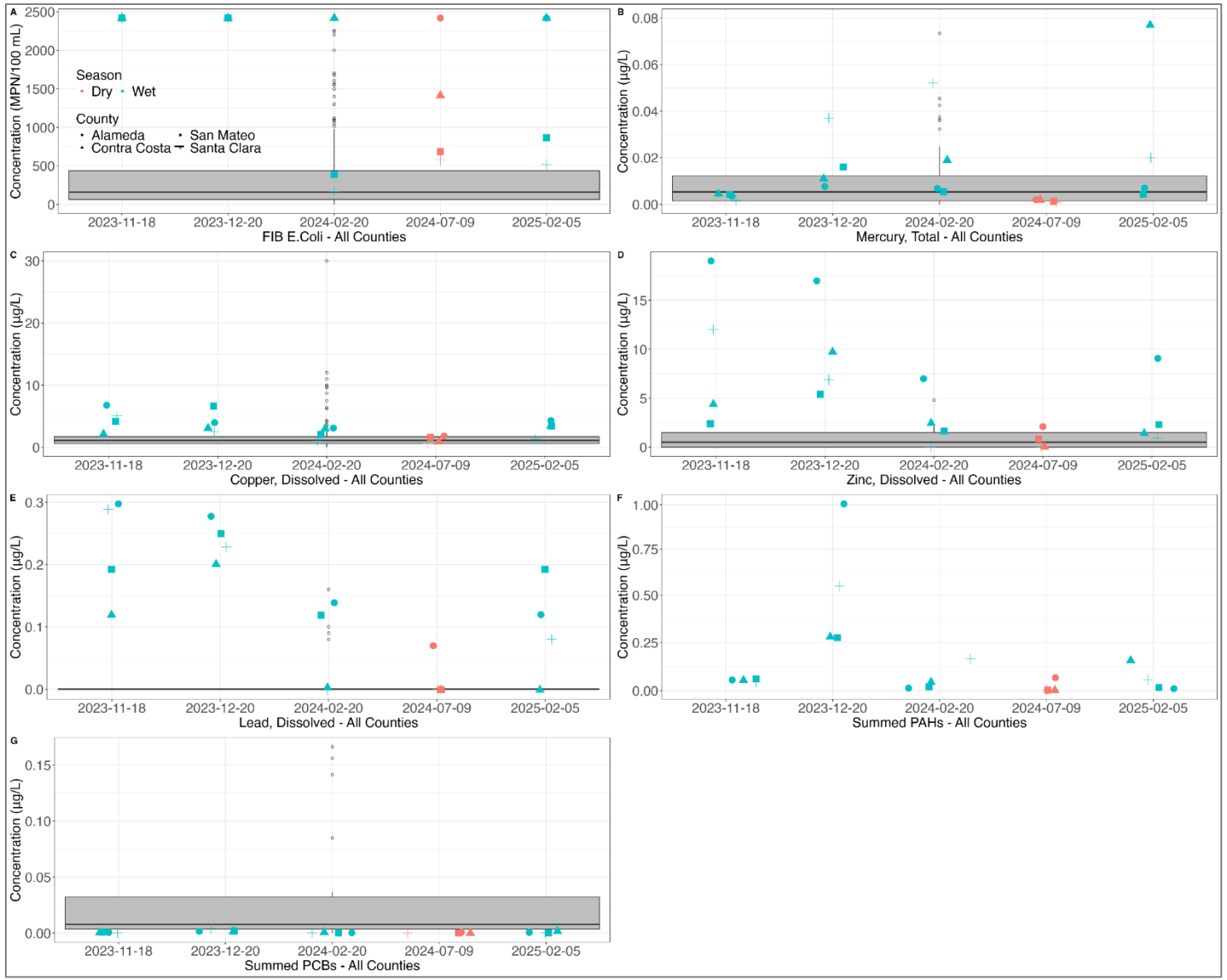

Figure A-2. Comparison of analyte concentrations across Alameda, Contra Costa, San Mateo and Santa Clara counties for E. coli, total mercury, dissolved copper, dissolved zinc, dissolved lead, total PAHs, and total PCBs

CEDEN data for PAHs was not available. E. coli concentrations are capped at 2419.6 MPN/100 mL.

Table A 1 Summary of CEDEN Non Detects

Analyte	County	Non-Detect Count	Total Count	% Non-Detect
Ammonia as N	Alameda	36	306	11.8%
Ammonia as N	Contra Costa	6	72	8.3%
Ammonia as N	San Mateo	12	137	8.8%
Ammonia as N	Santa Clara	39	248	15.7%
Copper, Dissolved	Alameda	0	23	0
Copper, Dissolved	Contra Costa	NA	NA	NA
Copper, Dissolved	San Mateo	0	26	0
Copper, Dissolved	Santa Clara	2	27	7.4%
FIB (*E.Coli*)	Alameda	0	37	0
FIB (*E.Coli*)	Contra Costa	0	29	0
FIB (*E.Coli*)	San Mateo	3	164	1.8%
FIB (*E.Coli*)	Santa Clara	0	94	0
Lead, Dissolved	Alameda	0	4	0
Lead, Dissolved	Contra Costa	NA	NA	NA
Lead, Dissolved	San Mateo	10	10	100
Lead, Dissolved	Santa Clara	13	13	100
Mercury, Total	Alameda	0	16	0
Mercury, Total	Contra Costa	0	7	0
Mercury, Total	San Mateo	0	17	0
Mercury, Total	Santa Clara	7	73	9.6%
Nitrate as N	Alameda	20	153	13.1%
Nitrate as N	Contra Costa	10	56	17.9%
Nitrate as N	San Mateo	18	100	18.0%
Nitrate as N	Santa Clara	18	165	10.9%
Nitrite as N	Alameda	39	180	21.7%
Nitrite as N	Contra Costa	8	54	14.8%
Nitrite as N	San Mateo	22	95	23.3%
Nitrite as N	Santa Clara	45	170	26.5%
Nitrogen, Total Kjeldahl	Alameda	45	271	16.6%
Nitrogen, Total Kjeldahl	Contra Costa	5	71	7.0%
Nitrogen, Total Kjeldahl	San Mateo	10	137	7.3%
Nitrogen, Total Kjeldahl	Santa Clara	24	212	11.3%
PCBs	Alameda	40	455	8.8%
PCBs	Contra Costa	8	310	2.6%
PCBs	San Mateo	53	306	17.3%
PCBs	Santa Clara	46	87	52.9%
Phosphorus as P	Alameda	6	273	2.2%
Phosphorus as P	Contra Costa	10	73	13.7%
Phosphorus as P	San Mateo	5	140	3.6%
Phosphorus as P	Santa Clara	9	218	4.1%
Zinc, Dissolved	Alameda	1	4	25.0%
Zinc, Dissolved	Contra Costa	NA	NA	NA
Zinc, Dissolved	San Mateo	4	10	40.0%
Zinc, Dissolved	Santa Clara	6	16	37.5%

Table A 2 Summary of RWL Non Detects

Analyte	County	Non-Detect Count	Total Count	% Non-Detect
Ammonia as N	Alameda	0	5	0
Ammonia as N	Contra Costa	0	5	0
Ammonia as N	San Mateo	0	5	0
Ammonia as N	Santa Clara	1	5	20%
Copper, Dissolved	Alameda	0	5	0
Copper, Dissolved	Contra Costa	0	5	0
Copper, Dissolved	San Mateo	0	5	0
Copper, Dissolved	Santa Clara	0	5	0
FIB (E.Coli)	Alameda	0	5	0
FIB (E.Coli)	Contra Costa	0	5	0
FIB (E.Coli)	San Mateo	0	5	0
FIB (E.Coli)	Santa Clara	0	5	0
Lead, Dissolved	Alameda	0	5	0
Lead, Dissolved	Contra Costa	0	5	0
Lead, Dissolved	San Mateo	0	5	0
Lead, Dissolved	Santa Clara	2	5	40%
Mercury, Total	Alameda	0	5	0
Mercury, Total	Contra Costa	0	5	0
Mercury, Total	San Mateo	0	5	0
Mercury, Total	Santa Clara	0	5	0
Nitrate as N	Alameda	0	5	0
Nitrate as N	Contra Costa	0	5	0
Nitrate as N	San Mateo	0	5	0
Nitrate as N	Santa Clara	0	5	0
Nitrite as N	Alameda	0	5	0
Nitrite as N	Contra Costa	0	5	0
Nitrite as N	San Mateo	0	5	0
Nitrite as N	Santa Clara	1	5	20%
Nitrogen, Total Kjeldahl	Alameda	0	5	0
Nitrogen, Total Kjeldahl	Contra Costa	0	5	0
Nitrogen, Total Kjeldahl	San Mateo	0	5	0
Nitrogen, Total Kjeldahl	Santa Clara	0	5	0
PAHs	Alameda	60	125	48.0%
PAHs	Contra Costa	57	125	45.6%
PAHs	San Mateo	68	125	54.4%
PAHs	Santa Clara	57	125	45.6%
PCBs	Alameda	77	195[a]	39.5%
PCBs	Contra Costa	86	195[a]	44.1%
PCBs	San Mateo	98	195[a]	50.3%
PCBs	Santa Clara	122	195[a]	62.6%
Phosphorus as P	Alameda	0	5	0
Phosphorus as P	Contra Costa	0	5	0
Phosphorus as P	San Mateo	0	5	0
Phosphorus as P	Santa Clara	0	5	0
Zinc, Dissolved	Alameda	0	5	0
Zinc, Dissolved	Contra Costa	0	5	0
Zinc, Dissolved	San Mateo	0	5	0
Zinc, Dissolved	Santa Clara	2	5	40%

a Total number of PCBs congeners across the five events is 195 rather than 200 due to how the laboratory reports co-elutions, where two congeners are reported together.

Table A3 Summery of Outliers in the CEDEN compiled data (2015-2024)

Analyte	Outlier Count	Total Count	Outlier Min	Outlier Max	Unit
Total PCBs	3	27	0.01	0.156	µg/L
Ammonia as N	78	763	0.27	1.3	mg/L
FIB (*E. coli*)	31	324	609	90,000	MPN/100 mL
Nitrate as N	43	474	0.57	11	mg/L
Nitrite as N	48	499	0.009	0.41	mg/L
Phosphorus as P	45	704	0.219	2.1	mg/L
Nitrogen, Total Kjeldahl	31	691	1.3	303	mg/L
Mercury, Total	20	113	0.015	5.13	µg/L
Zinc, Dissolved	1	30	4.8	4.8	µg/L
Lead, Dissolved	1	27	0.16	0.16	µg/L
Copper, Dissolved	8	76	2.4	2.4	µg/L

APPENDIX B
RWL Statistical Evaluation
Individual Counties

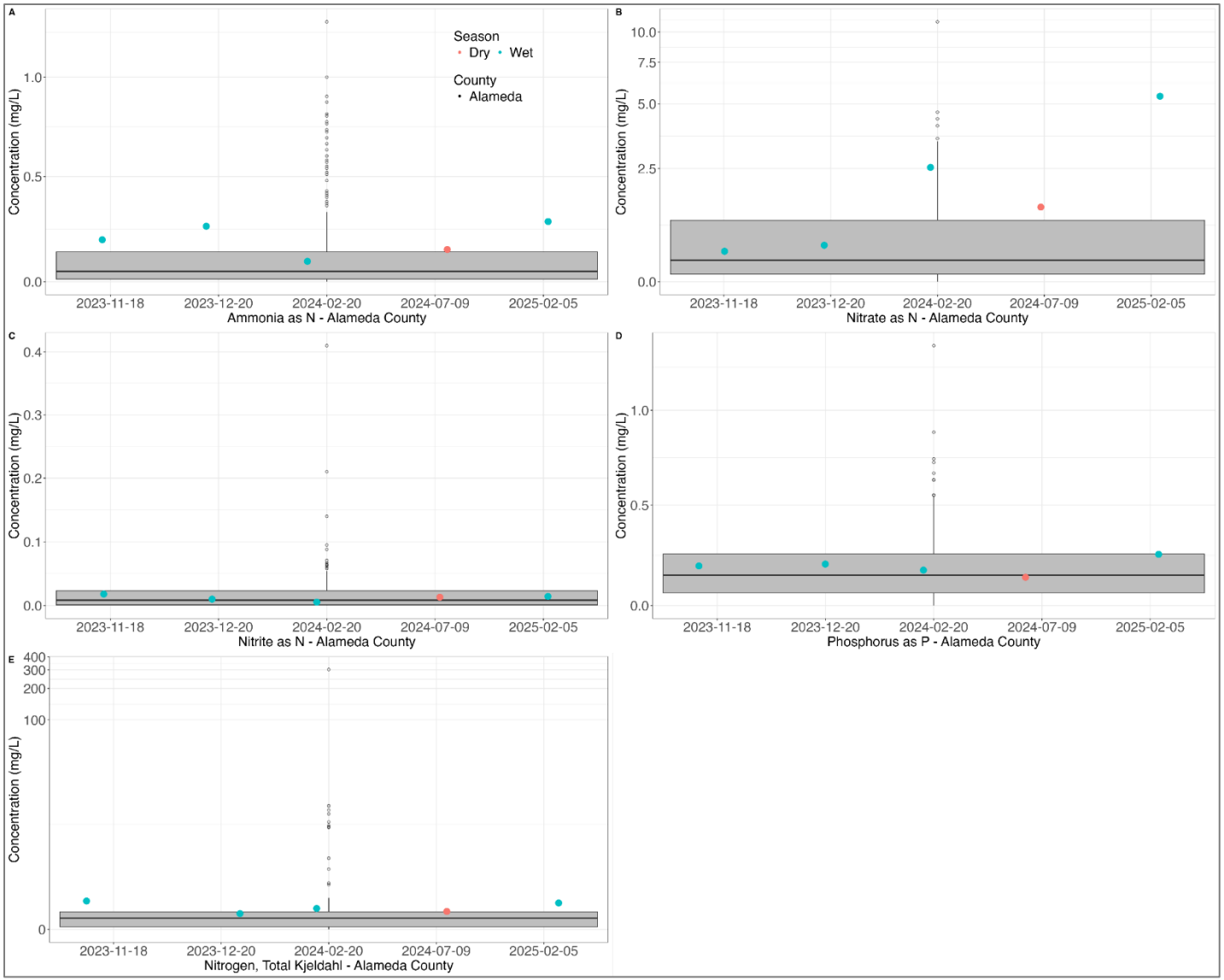

Figure B-1. Comparison of nutrient analyte concentrations within Alameda County

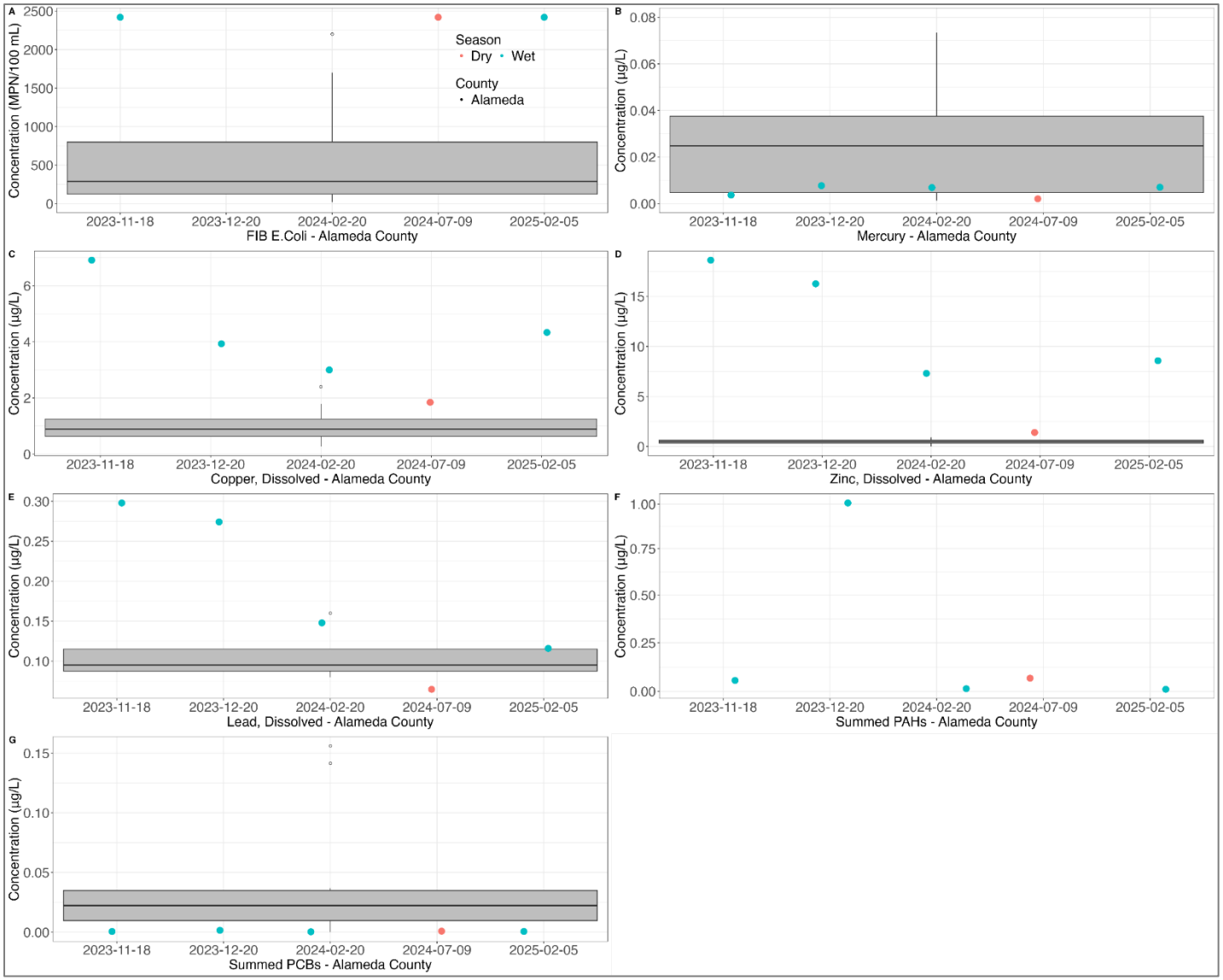

Figure B-2. Comparison of analyte concentrations within Alameda County for E. coli, mercury, copper, zinc, lead, PAHs, and PCBs

No CEDEN data available for PAHs. E. coli concentrations are capped at 2419.6 MPN/100 mL.

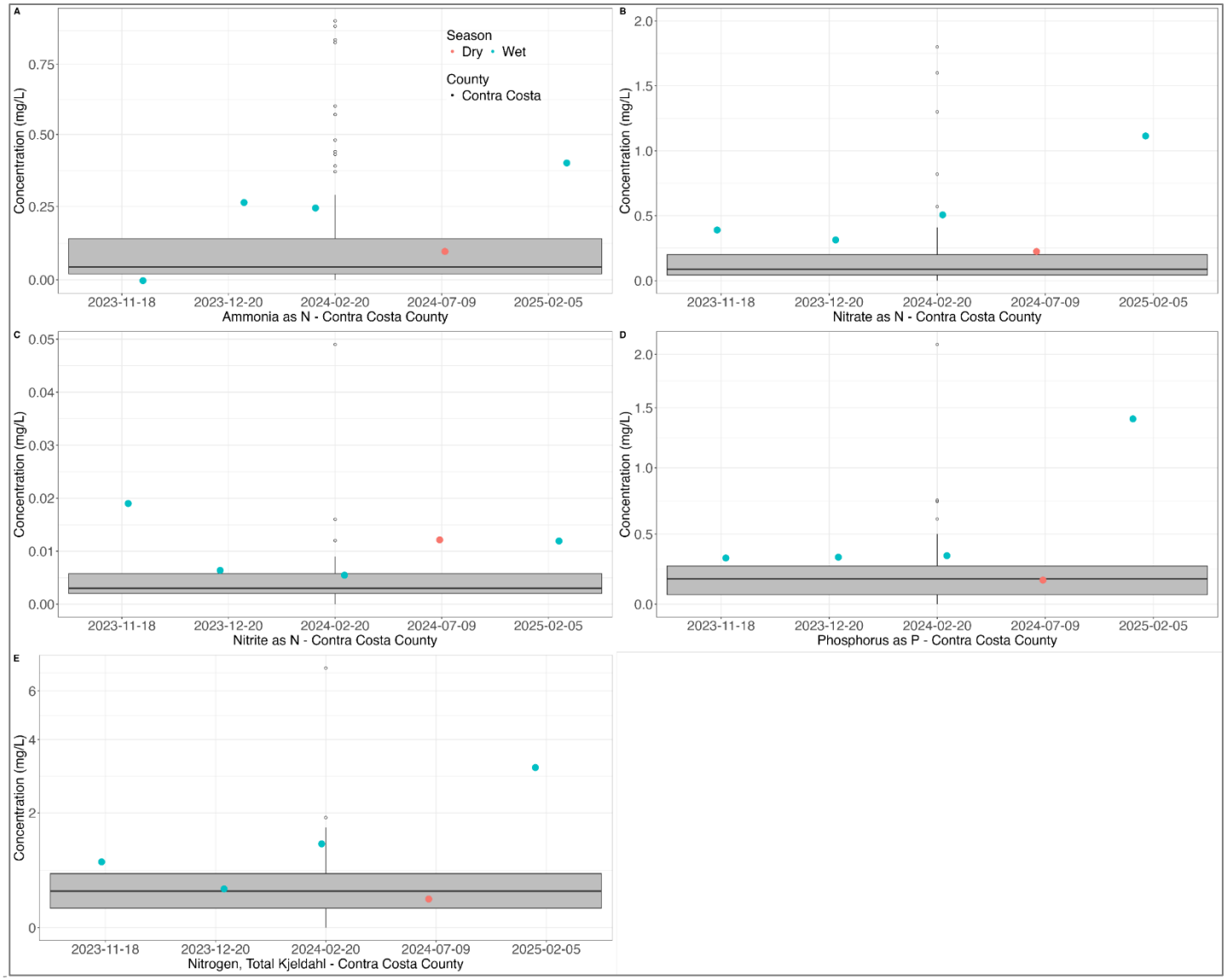

Figure B-3. Comparison of nutrient analyte concentrations within Contra Costa County

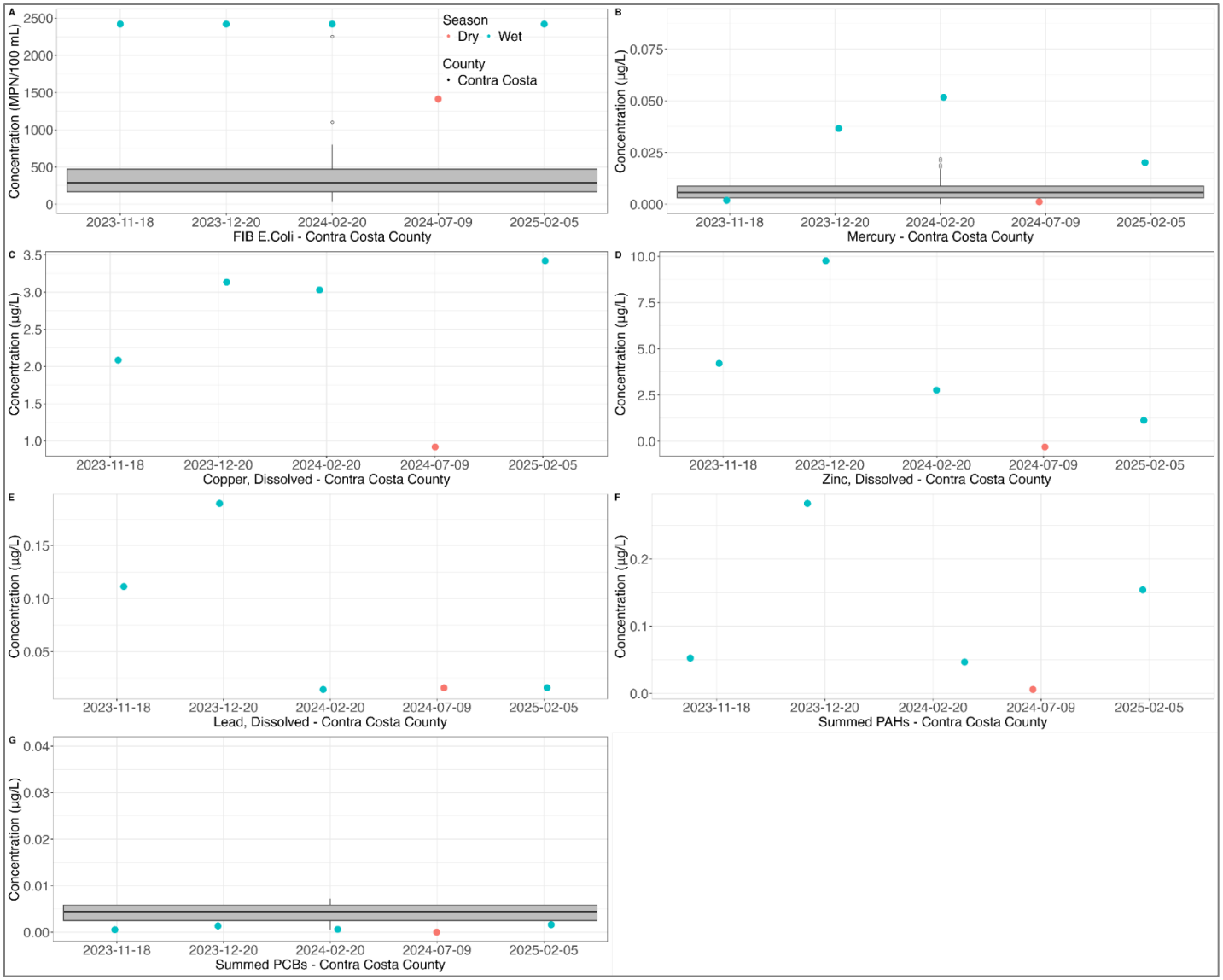

Figure B-4. Comparison of analyte concentrations within Contra Costa County for E. coli, total mercury, dissolved copper, dissolved zinc, dissolved lead, PAHs, and PCBs

No CEDEN data for Contra Costa County is available for dissolved copper, dissolved zinc, dissolved lead, and PAHs. E. coli concentrations are capped at 2419.6 MPN/100 mL.

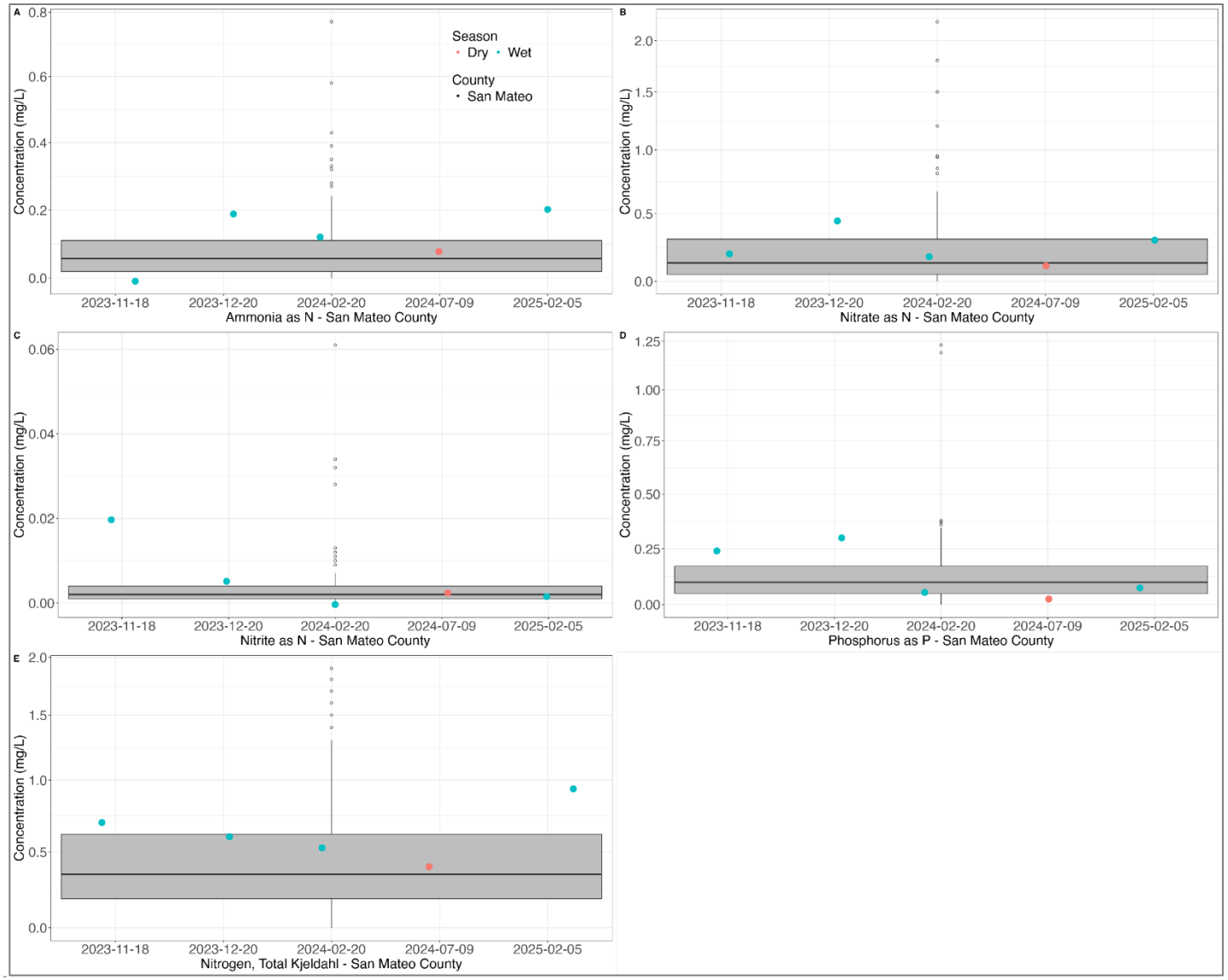

Figure B-5. Comparison of nutrient analyte concentrations within San Mateo County

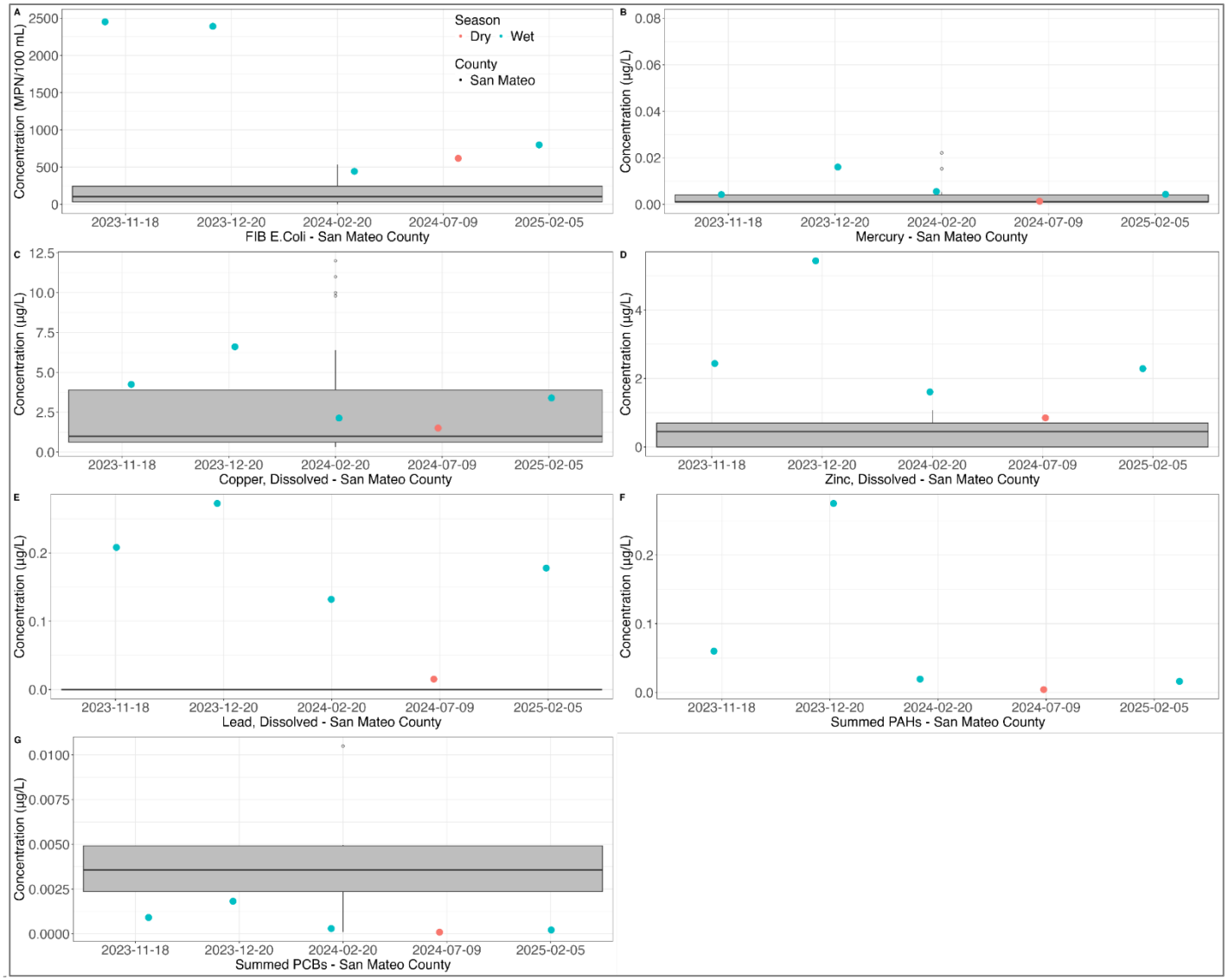

Figure B-6. Comparison of analyte concentrations within San Mateo County for E. coli, total mercury, dissolved copper, dissolved zinc, dissolved lead, PAHs, and PCBs

No CEDEN data for San Mateo County is available for PAHs and all dissolved lead results were non-detect above the method detection limit. E. coli concentrations are capped at 2419.6 MPN/100 mL.

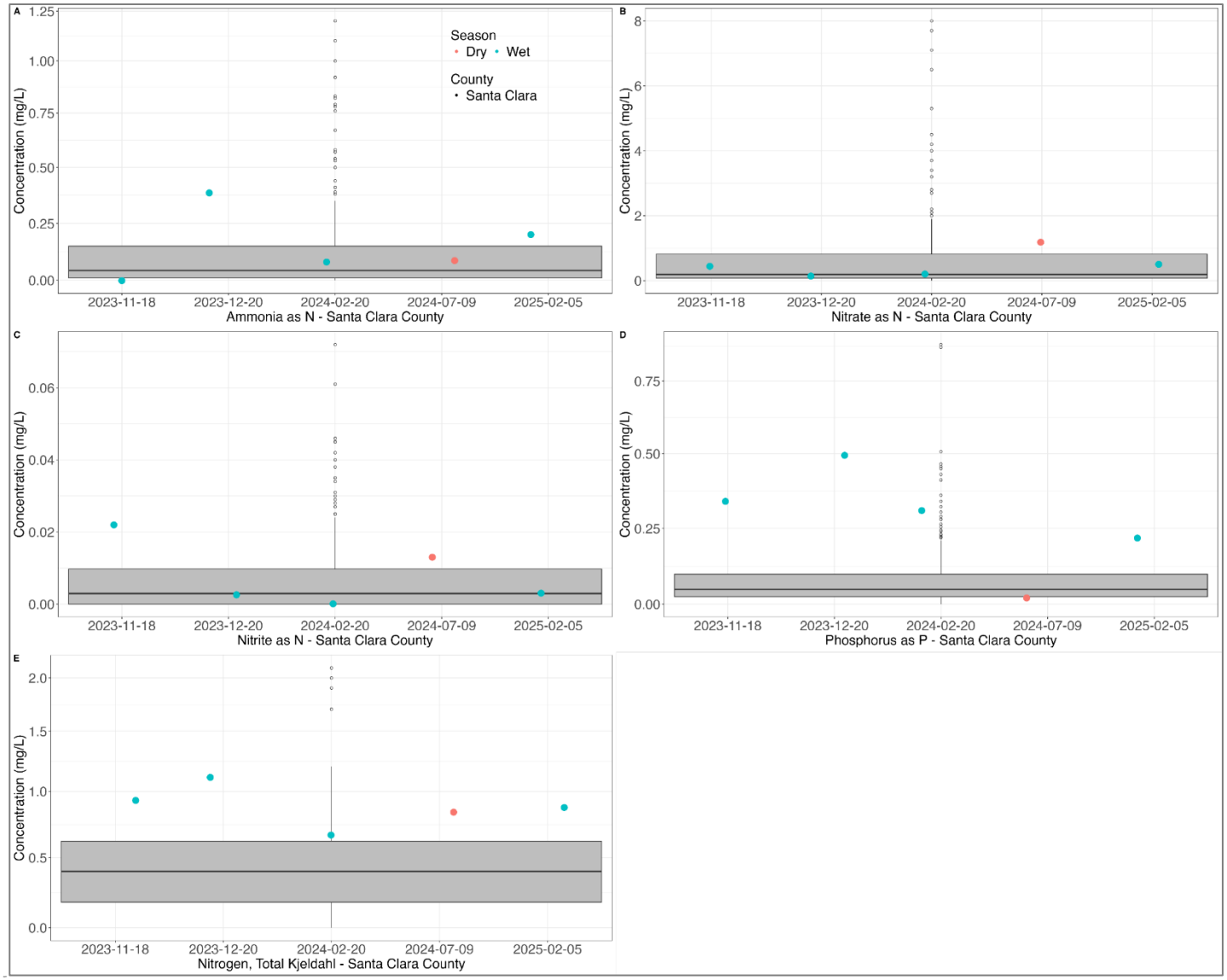

Figure B-7. Comparison of nutrient analyte concentrations within Santa Clara County

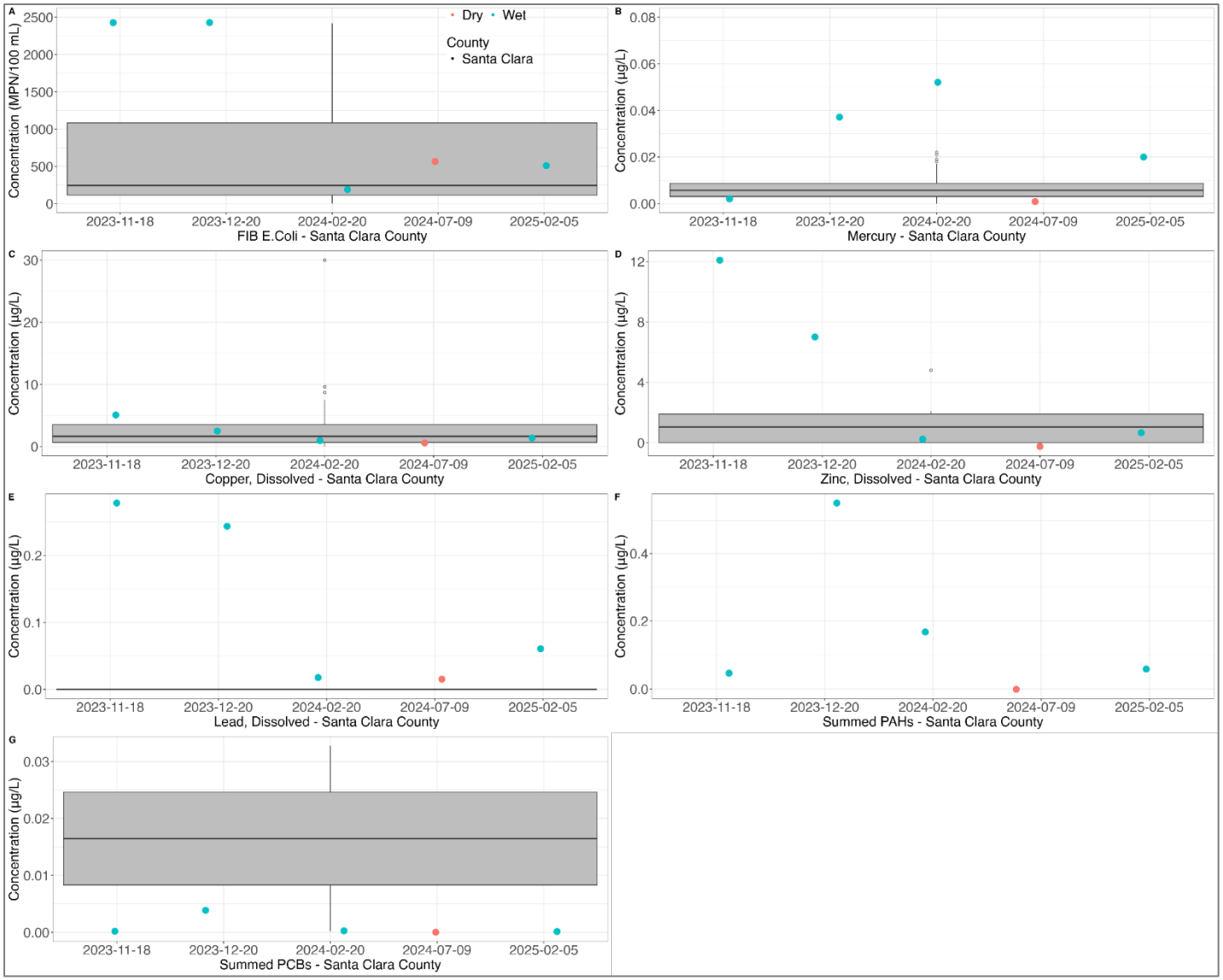

Figure B-8. Comparison of analyte concentrations within Santa Clara County for E. coli, total mercury, dissolved copper, dissolved zinc, dissolved lead, PAHs, and PCBs

No CEDEN data for Santa Clara County is available for PAHs and all dissolved lead results were non-detect above the method detection limit. E. coli concentrations are capped at 2419.6 MPN/100 mL.