CITY OF STOCKTON

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September 26, 2023

Ms. Elizabeth Lee, Unit Chief
Municipal Storm Water Permitting Unit
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670-6114

CITY OF STOCKTON AND COUNTY OF SAN JOAQUIN STORM WATER MANAGEMENT PROGRAMS 2022-2023 ANNUAL REPORT (ORDER NO. R5-2016-0040, NPDES PERMIT NO. CAS0085324)

Dear Ms. Lee:

For your review and consideration, the City of Stockton (City) and County of San Joaquin (County) are jointly submitting this 2022-2023 Annual Report, in accordance with the National Pollutant Discharge Elimination System Permit (NPDES) and Waste Discharge Requirements (WDR) General Permit for Discharges from Municipal Separate Storm Sewer Systems (MS4) (General Permit), Part V.F.4. The report reflects the required components of the programmatic and storm water monitoring activities conducted during Fiscal Year 2022-2023.

A copy has been submitted to centralvalleysacramento@waterboards.ca.gov.

If you have any questions, please contact Dagmara Saini of City of Stockton at (209) 937-8155 or dagmara.saini@stocktonca.gov or Roy Valadez of San Joaquin County at (209) 468-3605 or rvaladez@sjgov.org.

Sincerely,

CITY OF STOCKTON
JEFF MARASOVICH
DEPUTY DIRECTOR, COLLECTIONS & STORMWATER

COUNTY OF SAN JOAQUIN
ALEX CHETLEY
DEPUTY DIRECTOR OF DEVELOPMENT

Attachment: 2022-2023 Annual Report

Cc: Karen Ashby, Larry Walker Associates
Rachel Warren, Larry Walker Associates

OCTOBER 2023

CITY OF STOCKTON AND COUNTY OF SAN JOAQUIN

National Pollutant Discharge Elimination System

(Order Nos. R5-2016-0040-002 and R5-2016-0040-003)

Municipal Stormwater Program 2022-2023 Annual Report

PREPARED BY:

LARRY WALKER ASSOCIATES
science | policy | solutions

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CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations. [40 CFR 122.22(d)]

Executed on the 26th day of September 2023, at the City of Stockton.

Jeff Marasovich
City of Stockton
Deputy Director, Wastewater Operations

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CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations. [40 CFR 122.22(d)]

Executed on the _28 day of September 2023, at the County of San Joaquin.

Alex Chetley
County of San Joaquin
Deputy Director - Development

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1. INTRODUCTION

The current National Pollutant Discharge Elimination System (NPDES) and Waste Discharge Requirements (WDR) General Permit for Discharges from Municipal Separate Storm Sewer Systems (MS4) (Region-wide Permit) was adopted June 23, 2016.[1] The City of Stockton (City) and County of San Joaquin (County) submitted a Notice of Intent (NOI) application package on November 1, 2016, and each received a Notice of Applicability (NOA) from the Central Valley Regional Water Quality Control Board (Regional Water Board) on November 30, 2016.[2] Among other things, the NOI package included a Work Plan (NOI Work Plan) outlining how the current Stormwater Management Plan (SWMP) and any previously proposed modifications will be implemented within the jurisdictional limits of the City and the Phase I and Phase II urbanized areas of the County[3] until a revised SWMP is submitted to and approved by the Regional Water Board.

The City and County submitted the final *Assessment and Prioritization of Water Quality Constituents in the Stockton Urbanized Area* (Assessment and Prioritization) in October 2018.[4] This document identified the priority water quality constituents (PWQCs)—indicator bacteria, methylmercury, dissolved oxygen, and trash—that will be the focus of the stormwater program and the revised SWMP.

In July 2019, the City and County submitted a *Reasonable Assurance Analysis* (RAA) that identified strategies, activities, and milestones to address the PWQCs. The RAA results assist in guiding the revision of the SWMP and identifying prioritized strategies that can be implemented based on available capital and operations and maintenance resources. The revised SWMP will be structured to address the identified PWQCs and include milestones, strategies, and activities that will, over time (as identified through the RAA), ensure that the City's and the County's discharges will not cause or contribute to exceedances of applicable water quality objectives (WQOs) within the relevant receiving waters.

A SWMP has been and continues to be implemented within the jurisdictional limits of the City and the urbanized areas of the County regulated under the Region-wide Permit (i.e., the Stockton Urbanized Area or SUA and the County Phase II area).[5] The SWMP represents the strategy for controlling the discharge of pollutants from the MS4 to the Maximum Extent Practicable (MEP) and includes a wide range of Best Management Practices (BMPs). This Annual Report focuses on the control measures and BMPs included in the currently approved SWMP, with the modifications as noted in previous annual reports and the NOI Work Plan.

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[1] https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2016-0040_ms4.pdf

[2] City of Stockton under Order No. R5-2016-0040-002; County of San Joaquin under Order No. R5-2016-0040-003.

[3] The Regional Water Quality Control Board amended the County's Notice of Applicability (NOA) to include the County's Phase II MS4 jurisdictional area and terminate the County's enrollment under the State Water Resources Control Board's Phase II MS4 General Order for Storm Water Discharges from Small MS4s (Order WQ 2013-0001-DWQ, as amended). [Central Valley Regional Water Quality Control Board. Amended Notice of Applicability; General Permit for Discharges from Municipal Separate Storm Sewer Systems, Order R5-2016-0040. 11 February 2022]

[4] The draft Assessment and Prioritization was submitted May 30, 2017 and a revised, final version submitted on October 2, 2018.

[5] The current SWMP was approved by the Central Valley Regional Water Quality Control Board on October 9, 2009 (Resolution R5-2009-0105).

The Region-wide Permit requires Annual Reports, Mid-Term Reports, and End-Term Reports. The Mid-Term and End-Term Reports serve as the Annual Report for the years submitted and include the applicable effectiveness assessment(s). A summary of the annual reporting schedule is provided in **Table 1**. The Region-wide Permit has expired and has been administratively continued; thus, the five-year reporting cycle began again with the 2021-2022 Annual Report.

Table 1. Annual Reporting Schedule

Permit/Fiscal Year[a]	Report Type & Reporting Period	Status
Year 1 (2016-2017)	Annual Report (2016-2017)	*Complete*
Year 2 (2017-2018)	Annual Report (2017-2018)	*Complete*
Year 3 (2018-2019)	Mid-Term Report (2016-2019)	*Complete*
Year 4 (2019-2020)	Annual Report (2019-2020)	*Complete*
Year 5 (2020-2021)	End-Term Report (2016-2021)	*Complete*
Year 6 (2021-2022)	Annual Report (2021-2022)	*Complete*
Year 7 (2022-2023)	**Annual Report (2022-2023)**	**Current Submittal**

[a] **Bold, blue text** indicates the current report type.

This 2022-2023 Annual Report is being submitted in accordance with Region-wide Permit Provisions V.F.4 and includes the items summarized in **Table 2**.

Table 2. Summary of Annual Report Requirements

Report Requirement	Location
(a.i) Certification that the Storm Water Management Plan and Work Plan were implemented as approved.	Section 2
(a.ii) A summary of activities and tasks scheduled to be implemented in the upcoming year.	Section 2
(a.iii) Proposed minor modifications to the Storm Water Management Program; or any proposed Work Plan Modification.	Section 6
(a.iv) A completed certification statement, in accordance with the signatory requirements in Attachment H (Standard Permit Provisions and General Provisions).	Certification Statements
(c) Water quality data (annual).	Appendix B, C
(d) Additional requirements described in 40 CFR §122.42(c) (Attachment H, Standard Permit Provisions and General Provisions).	Certification Statements Section 3 Section 4 & Appendix B, C Section 5

2. IMPLEMENTATION STATEMENT

The City and County have implemented the stormwater program consistent with the intent of the approved 2009 SWMP (and modifications thereto) and as described by the NOI Work Plan submitted to, and approved by, the Regional Water Board in November 2016 (**Appendix A**, *2016 NOI Work Plan*).

During 2023-2024, until a revised SWMP and Work Plan are approved, the City and County will continue to implement the stormwater program as outlined by the 2016 NOI Work Plan.

3. FISCAL ANALYSIS

The City and County annually assess the current NPDES expenditures, as well as the projected expenditures for the next fiscal year. The City's and County's fiscal analyses are provided in **Table 3** and **Table 4,** respectively.

Table 3. 2022-2023 Fiscal Analysis, City of Stockton

Program Element	Expenditures During Fiscal Year 2022-2023[a]	Estimated Budget for Fiscal Year 2023-2024[a][b]
Program Management: Staff salaries, utility billing, phone charges, computer software/rentals, memberships, permit fees, indirect cost allocations, training, consultant contracts	$1,075,000	$2,581,000
Public Outreach: Staff salaries, industrial, commercial, and residential programs, including media and community events	$32,000	$103,000
Municipal Operations: Staff salaries, Capital Improvement Projects (CIPs), and Storm Drain System Cleaning and Maintenance (includes Illicit Discharges, illegal connections mitigation, and clean-up)[c]	$3,515,000	$5,858,000
Industrial and Commercial: Staff salaries, inspections, and follow-up inspections[d]	$57,000	$218,000
Construction: Staff salaries, outreach	$224,000	$278,000
Planning and Land Development: Staff salaries	$76,000	$145,000
Water Quality Monitoring: Includes monitoring at six water bodies on an annually rotating basis	$146,000	$269,000
Water Quality Based Programs: Includes pollutant-specific work efforts (e.g., Trash Implementation Plans, Pyrethroid Control Program)	--[e]	--[e]
TOTAL	**$5,124,000**	**$9,453,000[f]**

[a] Values have been rounded to the nearest $1,000.

[b] Annually, the City compartmentalizes the overall budget into individual Program Element expenditures. The City has developed and is implementing a consistent methodology for tracking stormwater program expenditures.

[c] Facility Pollution Prevention Plans (FPPPs) are paid for out of Public Works budget and are not a Stormwater Expense.

[d] The Industrial and Commercial Inspection Program is conducted in-house by Stormwater and Environmental Control Staff.

[e] Expenditures associated with Water Quality Based Programs are reflected and reported in the Water Quality Monitoring Program expenditures.

[f] The reasons for the 2023-2024 estimated budget increase are as follows: (1) It takes into account full salaries, including overtime, for all positions, and assumes no positions will be vacant; (2) the City anticipated increases in service contracts; (3) the City experienced supply chain issues last year, delaying procurement of fleet and large equipment, which it anticipates procuring in 2023-2024; and (5) the City budgeted contingency for potential stormwater emergencies, based on the emergencies experienced in 2022-2023.

The City's stormwater program is funded primarily by a storm drain maintenance or user fee of $2.10/month per Equivalent Residential Unit. During 2022-2023, the storm drain maintenance fee program generated $5,745,000 in revenue. Stormwater inspection fees (commercial, industrial, construction) generated an additional $156,000 in revenue, for a total of $5,900,000 during 2022-2023. The City predicts a total revenue of $5,997,000 during 2023-2024 from those sources.

Table 4. 2022-2023 Fiscal Analysis, County of San Joaquin

Program Element	Expenditures During Fiscal Year 2022-2023[a][b]	Estimated Budget for Fiscal Year 2023-2024
Program Management	$ 684,000	$ 600,000
Illicit Discharges	$ 0	$ 1,000
Public Outreach	$ 53,000	$ 40,000
Municipal Operations	$ 12,000	$ 15,000
Industrial and Commercial	$ 3,000	$ 8,000
Construction	$ 20,000	$ 35,000
Planning and Land Development	$ 98,000	$ 90,000
Water Quality Monitoring Programs and Water Quality Based Programs[c]	$ 47,000	$ 60,000
TOTAL	**$ 918,000**	**$ 849,000**

[a] Values have been rounded to the nearest $1,000.

[b] Actual expenditures for fiscal year 2022-2023 do not reflect the County's 2022-2023 shared costs of co-permittee expenditures with the City of Stockton.

[c] Effective in fiscal year 2018-2019, actual expenditures associated with Water Quality Based Programs are reflected and reported in the Water Quality Monitoring Program expenditures.

The County's funding sources are summarized in **Table 5**. The County's stormwater program is funded primarily by a storm drain maintenance or user fee assessed at $35/year per Equivalent Residential Unit. During 2022-2023, these programs generated $788,000 in revenue. The County predicts a total revenue of $830,000 for 2023-2024.

Table 5. 2022-2023 Funding Sources, County of San Joaquin

Source	Funding for Fiscal Year 2022-2023, by Percentage
Assessment Fee/Special District Fund (Fee $35/parcel)	77.75%
Inspection/plan check fees	12.17%
Miscellaneous Revenue – Interest Income	10.08%
Operating Transfers	0.00%

4. WATER QUALITY MONITORING ANNUAL ASSESSMENT

Provision V.E of the Region-wide Permit requires monitoring of urban runoff and receiving waters within the MS4 jurisdiction. In accordance with the previous permit, the City and County received approval from the Regional Water Board in 2015 for conducting an Alternative Monitoring Program (AMP).[6] The AMP is consistent with the proposed monitoring program from the Report of Waste Discharge (June 2012 ROWD),[7] meets the objectives of the Region-wide Permit, directs resources to the most critical water quality issues, and collects data to support management decisions to address those critical issues.

The AMP's primary objective is to focus on Pollutants of Concern (POCs), as identified within the June 2012 ROWD, and implement an intensive monitoring approach to determine the source(s) of pollutants in urban discharges. In addition to the AMP, the City and County were approved to participate in the Delta Regional Monitoring Program (Delta RMP) in lieu of conducting some of the local water quality monitoring (**Appendix D**).[8]

As a result, the revised monitoring program was initiated during the 2015-2016 reporting period and has been implemented since that time. The AMP will form the basis of the monitoring program that will be submitted as a part of the revised SWMP and will shift the monitoring program focus from the POCs to the PWQCs identified in the Assessment and Prioritization.

The monitoring program is a focused effort conducted within six key water bodies on a rotating basis. The schedule for the staggered waterbody monitoring was updated in June and August of 2021[9] and is shown in **Table 6**.

[6] City of Stockton and County of San Joaquin. Submittal of Alternative Stormwater Monitoring Program (Order No. R5-2015-0024). June 10, 2015; Central Valley Regional Water Quality Control Board. Approval of City of Stockton and County of San Joaquin's 27 October Alternative Monitoring Program. 4 November 2015.

[7] National Pollutant Discharge Elimination System Municipal Stormwater Program – Report of Waste Discharge & Proposed Stormwater Management Plan, June 2012 (Section 2.7; Tables 2-42, 2-43, 2-44, 2-45, 2-46, and 2-47).

[8] Central Valley Regional Water Quality Control Board. Approval to Allow the City of Stockton and County of San Joaquin to Reduce Local Water Quality Monitoring and Participate in the Delta Regional Monitoring Program. 4 November 2015.

[9] In June and August of 2021, the City and County received approval to alter the fiscal year 2021-2022 annual water body rotation (switching the order of Mosher Slough and Calaveras River) so that the stormwater monitoring was also aligned with the Pyrethroid Baseline Monitoring [See Approval to Allow the City of Stockton and County of San Joaquin to Alter Fiscal Year 2021-2022 Water Body Monitoring. June 7, 2021 and Response to Request to Modify the City of Stockton & County of San Joaquin's Municipal Separate Storm Sewer System Alternative Monitoring Plan, August 6, 2021.]

Table 6. AMP Staggered Waterbody Monitoring Schedule

Waterbody[a]	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
Mosher Slough[b]								
Calaveras River[a]								
Duck Creek[b]								
Smith Canal[b]								
Mormon Slough[b]								
Five-Mile Slough[b]								

[a] Blue text indicates the most recent year's monitoring location.
[b] Historical monitoring locations.

Monitoring results for each previous fiscal year have been summarized in the corresponding Annual Report. Constituents monitored for each waterbody are summarized in **Table 7**.

Table 7. Summary of Constituents Monitored by Waterbody from 2015-2023

Constituents Monitored	Monitoring Type	Waterbody					
		Mosher Slough	Calaveras River [a]	Duck Creek	Smith Canal	Mormon Slough	Five-Mile Slough
Full suite of constituents (**Table 13**)	Water quality	✓	✓	✓	✓		
Dissolved Oxygen	Water quality	✓	✓	✓	✓	✓	✓
Methylmercury and mercury	Water quality	✓	✓	✓	✓		
E. coli & fecal coliform	Water quality	✓	✓	✓	✓	✓	✓
Chlorpyrifos and pyrethroids	Water quality	✓	✓	✓	✓		✓
Sediment toxicity & sediment chemistry	Sediment	✓	✓	✓	✓		
Water column toxicity	Water column	✓	✓	✓	✓		

[a] Pyrethroid monitoring will continue only at Calaveras River, the representative waterbody for the Stockton Urbanized Area.

4.1 WATERBODY AND DRAINAGESHED MONITORING

The Mosher Slough drainageshed primarily comprises residential and commercial land uses and flows west through the City. Mosher Slough receives urban runoff, upstream agricultural runoff, and agricultural return flows.

Sites monitored are shown in **Figure 1** and listed in **Table 8**. Monitoring is focused on the POCs identified in the 2012 ROWD[7] which include:

- Indicator bacteria (E. coli and fecal coliform)
- Pesticides
- Dissolved oxygen (DO)
- Mercury

Several modifications to the AMP for the 2022-2023 monitoring season were requested by the City and County to prioritize monitoring based on current water quality conditions. These requested modifications were approved by the Regional Water Board in June 2022.[10]

[10] Central Valley Regional Water Quality Control Board. Response to Request to Modify the City of Stockton & County of San Joaquin's Municipal Separate Storm Sewer System Alternative Monitoring Plan (WDID#s: 5 S39M1000205 & 5S39M1000204). 10 June 2023.

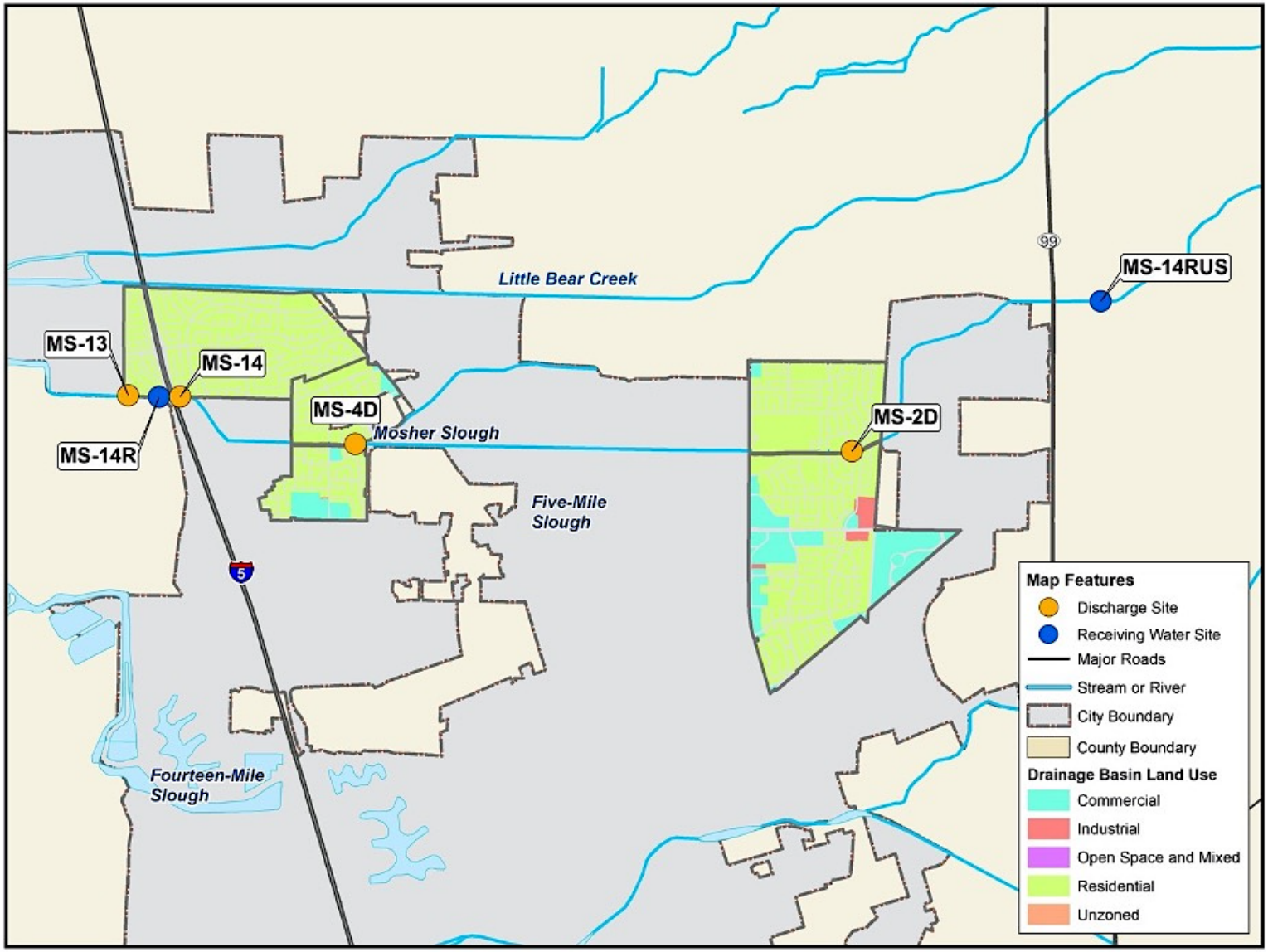

Figure 1. Mosher Slough Monitoring Sites and Discharge Site Drainagesheds

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Table 8. Mosher Slough Monitoring Sites and Constituents Monitored

Constituents Monitored	Monitoring Type	Sites Monitored					
		MS-14RUS	MS-2D	MS-4D	MS-14[a]	MS-14R[a]	MS-13
Field parameters	Water quality	G	G	G	G	G	G
E. coli and fecal coliform	Water quality	G	G	G	G	G	G
Methylmercury	Water quality	G	G	G	G	G	G
Dissolved Oxygen	Water quality	G	G	G	G	G	G
Mercury	Water quality	G	G	G	G	G	G
Total Aluminum	Water quality	G	G	G	G	G	G
Total Iron	Water quality	G	G	G	G	G	G

Notes:
G = Grab
Sed= Sediment
[a] Historical Monitoring Site

Monitoring activities completed during 2022-2023 are summarized in **Table 9**, with the results presented in the subsequent sections.

Table 9. 2022-2023 Monitoring Program Activities

Monitoring Program Activity	Status
Outfall and Receiving Water Monitoring (**Section 4.1.2**)	• 2 wet weather events[a] monitored at 4 urban discharge[b] and 2 receiving water sites • 4 dry weather events monitored at 4 urban discharge and 2 receiving water sites
Rainwater/Atmospheric Deposition Monitoring (**Section 4.1.3**)	• Rainwater was monitored at 2 locations during 2 wet weather events

[a] Wet weather events were completed for two of the three periods defined in the AMP (i.e., October-November, December-March). However, no qualifying storm event occurred in the April through June time period).
[b] Due to lack of water present, the receiving water site MS-14RUS was not sampled during two dry events, on December 1, 2022 and April 26, 2023, and during two storm events, on November 8, 2022 and December 1, 2022.

4.1.1 Storm Tracking and Selection

Monitoring of stormwater runoff is a key component of the program[11] and requires a high level of equipment and field crew coordination. Incoming storms are tracked and assessed against storm selection criteria (e.g., expected amount of precipitation, days since last rain event, anticipated duration of event) and the forecasted reliability that the storm will occur in the SUA. Wet weather monitoring is particularly challenging, as rainfall forecasts are often unreliable due to the convective nature of incoming storms. In addition, because storms normally intersect Stockton traveling from the west to the east, it is not unusual for northern Stockton to receive substantial rainfall, while southern Stockton remains dry, or vice versa.

Wet weather events are timed to attempt to capture urban runoff impacts with the highest possible representation of the targeted storm event (i.e., high percent capture) using flow-based composite samplers at urban discharge stations when possible. Grab sampling techniques, when feasible, are conducted near the peak of storm event hydrographs, and are used at all receiving water stations. Due to standard method requirements, grab sampling is used for the following constituents, when monitored at the applicable waterbody:

- Indicator bacteria
- Mercury/methylmercury

The daily total rainfall at the Stockton Metropolitan Airport[12] during the 2022-2023 monitoring year is shown in **Figure 2**. The total cumulative total seasonal rainfall (relative to the historical average[13]) and monitoring event timing are also shown. Historical average annual rainfall at the Stockton Metropolitan Airport is 13.45 inches. The 2022-2023 monitoring year had above-average precipitation with 23.34 inches of rain, which is 170% of historical annual rainfall. The 2023 water year classification is not expected to be determined until May 2024. However, the California Department of Water Resources classified the previous water year (ending September 30, 2022) as “critical” for the San Joaquin Valley.[14]

[11] The Region-wide Permit defines the “monitoring year” as October 1 through September 30. Monitoring events are reported for the fiscal year, due to the time needed for data reporting and processing.

[12] https://cdec.water.ca.gov/dynamicapp/staMeta?station_id=SOC

[13] Based on a rolling average for 1991-2020 data. https://www.cnrfc.noaa.gov/awipsProducts/RNORR4RSA.php

[14] http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST

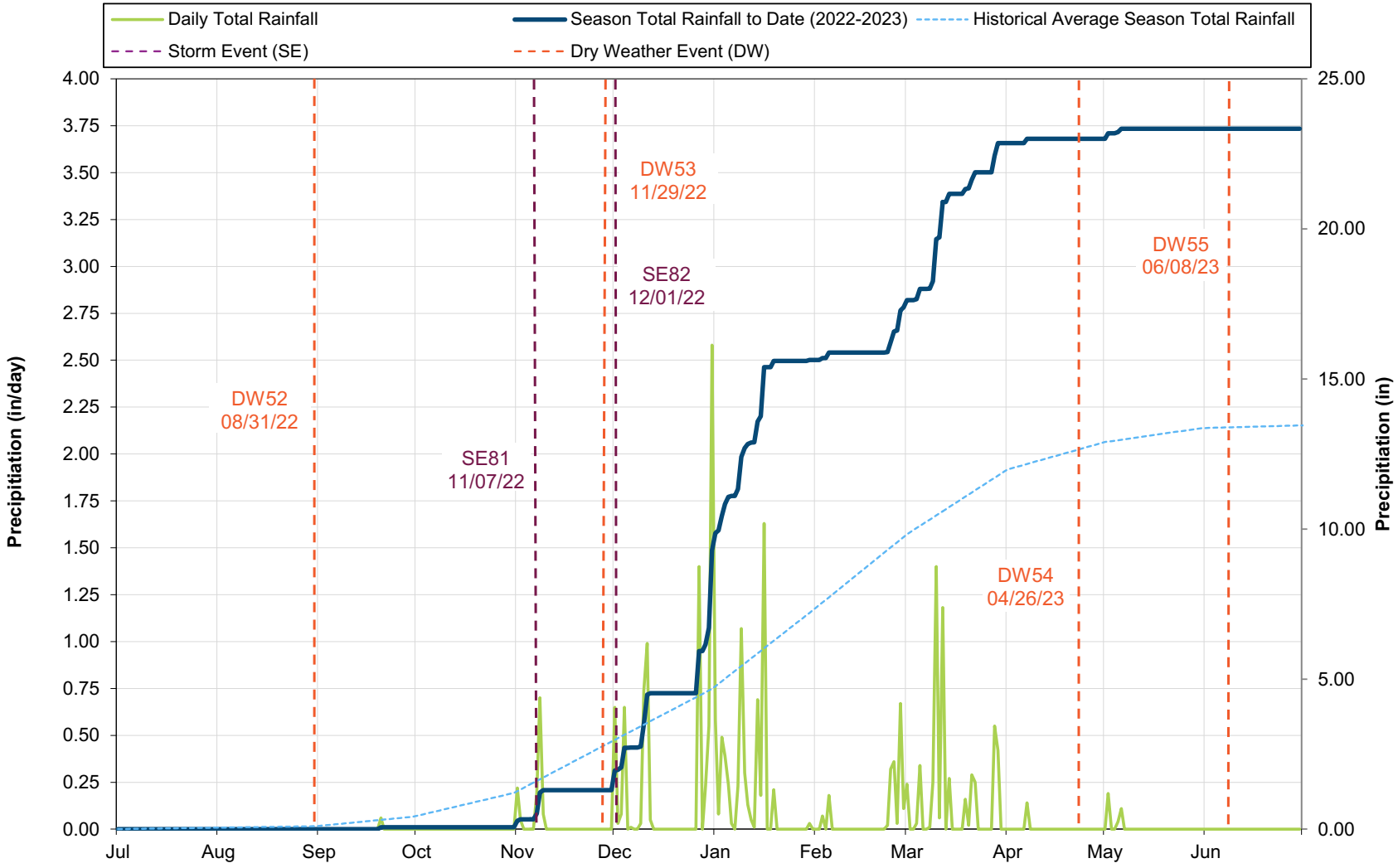

Figure 2. 2022-2023 Precipitation at Stockton Metropolitan Airport and Captured Monitoring Events

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4.1.1.1 Details of 2022-2023 Wet Weather Monitoring Events

Each monitoring event is unique in terms of the antecedent weather conditions, flow in the receiving waterbody, field conditions, etc. Runoff quality is particularly influenced by the amount and intensity of rainfall and time of sampling with respect to the rainfall hydrograph. The conditions for wet weather events conducted in 2022-2023 are summarized in **Table 10**.

Table 10. Details of 2022-2023 Wet Weather Monitoring Events

Storm Events[a][b]	SE81 11/08/2022	SE82 12/01/2022
Time of first rain	11/07/2022 16:30[c]	12/01/2023 5:55
Time of last rain	11/07/2023 17:55	12/01/2022 17:00
Total rain (in)	0.33	0.68
Antecedent Conditions		
Date of last precipitation	11/01/2022	11/07/2022
Date of last storm > 0.1 in	6 days	11/07/2022
Days since last storm	6 days	24 days
Date of last storm > 0.25 in	9/19/2022	11/07/2022
Days since last storm	49	24 days
Cumulative rainfall to date (in)[c]	0.46	1.91

[a] Precipitation data are collected at the Stockton Metropolitan Airport, available at: https://mesowest.utah.edu/cgi-bin/droman/download_api2.cgi?stn=KSCK&year1=2014&day1=19&month1=6&hour1=&timetype=LOCAL&unit=0

[b] Per the AMP approved by the Regional Water Board, rainfall events of 0.15''- 0.25'' are targeted for the monitoring program.

[c] Sampling continued overnight and ended 11/08/2023.

4.1.2 Outfall and Receiving Water Monitoring

The monitoring program includes urban discharge outfall and receiving water monitoring. In 2022-2023, monitoring was completed at each urban discharge and receiving water site during two (2) of the three periods defined in the AMP (i.e., October- November and December-March); no qualifying event occurred in the April through June time period. All four (4) dry weather events were completed during the 2022-2023 monitoring year. Urban discharge outfall monitoring characterizes the quality of urban runoff discharged from four storm drain outfalls along Mosher Slough. Receiving water monitoring characterizes the quality of the receiving waters within the SUA. One receiving water site was sampled downstream of the urban discharge sites, and one receiving water site was sampled upstream of the urban discharge sites. The co-located sites are used to help determine if the urban discharge is potentially causing or contributing to contemporaneous in-stream exceedances of applicable water quality objectives.

Monitoring sites sampled in 2022-2023 are shown in **Table 8** and **Table 11**.

- Urban discharge sites are labeled with a station and number code (e.g., MS-14).
- Receiving water sites are labeled with an "R" for receiving water (e.g., MS-14R).

Table 11. Sites Sampled and Type of Sample Collected in 2022-2023

Event Code	Sample Date	Site Type and Station ID					
		Urban Outfall				Receiving Water	
		MS-2D	MS-4D	MS-13	MS-14	MS-14RUS	MS-14R
DW52	8/31/2022	G	G	G	G	G	G
SE81	11/7/2022	G	G	G	G	G	G
DW53	11/29/2023	G	G	G	G	G	G
SE82	12/1/2023	G	G	G	G	G	G
DW54	4/26/2023	G	G	G	G	G	G
DW55	6/8/2023	G	G	G	G	G	G

G : Grab
NS : Not Sampled
[a] Due to lack of water, site MS-14RUS was not able to be sampled.

The outfall and receiving water monitoring sites and predominant land uses are summarized in **Table 12**.

Table 12. 2022-2023 Outfall and Receiving Water Monitoring Sites for Mosher Slough

Site Type	Station ID	Monitoring Site Description	Predominant Land Use	Drainage Area (acres)
Urban Outfall	MS-2D	Mosher Slough Pump Station 2D off of Pyrenees	Residential / Commercial	390
	MS-4D	Mosher Slough Pump Station 4D off of Don Avenue	Residential/ Commercial	1,119
	MS-13	Mosher Slough Pump Station 13 off of Twin Brooks	Residential/ Commercial	102
	MS-14	9211 Kelly Drive	Residential/ Commercial	533
Receiving Water	MS-14RUS	Mosher Slough at North Cole Drive	Residential/ Agricultural	N/A
	MS-14R	Mosher Slough at Mariners Drive Bridge	Residential/ Agricultural	N/A

Monitoring is generally conducted during three (3) wet weather events and four (4) dry weather events each year. During 2022-2023, monitoring was completed at each urban discharge and receiving water site two (2) times during the wet season and four (4) times during the dry season. Rainwater samples were captured during both storm events. The timeline of the events and sites sampled during each event are shown in **Figure 2**. Wet weather events (labeled "SE" for storm event) and dry weather events (labeled "DW" for dry weather) are numbered sequentially from the time when wet weather and dry weather monitoring events were initiated (in 1992 and 2004, respectively).

4.1.2.1 Monitored Constituents and Analytical Methods

The constituents and corresponding analytical methods for urban discharge and receiving water monitoring comply with the Method Detection Limits (MDLs) specified in the monitoring program.[15] The MDLs for the constituents sampled during the 2022-2023 monitoring events are shown in **Table 13.**

Table 13. Constituent Analysis for Outfall and Receiving Water Monitoring in 2022-2023

Constituents	Method Detection Limits (MDLs)	Water Quality Objectives (WQOs)	WQO Source
Conventional Pollutants / Field Measurements			
Date	mm/dd/yyyy	-	-
Sample Time	hr:min (regular time)	-	-
Weather	Degrees F	-	-
Water Temperature	Degrees C	-	-
pH	0 - 14	6.5 – 8.5	Basin Plan[a]
Dissolved Oxygen	Sensitivity to 5 mg/L	>5 or >6[b]	Basin Plan
Specific Conductance		900	MCL (Basin Plan)
Indicator Bacteria, MPN/100mL			
E. coli	10	235[c]	Stockton Urban Waterbodies Pathogen TMDL (Basin Plan)
Fecal Coliform	1.8	400	
Mercury, ng/L			
Mercury, Total	0.2	50	CTR
Methylmercury, Total	0.02	-	Basin Plan[d]
Metals, mg/L			
Aluminum, Total	0.004	0.75 / 0.2	USEPA / MCL (Basin Plan)
Iron, Total	0.005	0.3	MCL (Basin Plan)

[a] Water Quality Control Plan for the Sacramento River and San Joaquin River basins.
[b] The WQO is >6 mg/L from September 1 – November 30.
[c] This is not a WQO; it is the Stockton Urban Waterbodies Pathogen TMDL single sample maximum water quality target.
[d] The methylmercury objective is a tissue-based objective. For the Sacramento-San Joaquin Delta and Yolo Bypass waterways listed in Basin Plan Appendix 43 (including waterways in the Stockton Urbanized Area), the average methylmercury concentrations shall not exceed 0.08 and 0.24 mg methylmercury/kg, wet weight, in muscle tissue of trophic level 3 and 4 fish, respectively (150-500 mm total length). The average methylmercury concentrations shall not exceed 0.03 mg methylmercury/kg, wet weight, in whole fish less than 50 mm in length.

[15] Some questions exist as to the applicability of these water quality objectives and criteria to stormwater discharges because an appropriate Water Code section 13241 analysis was not performed on the state water quality objectives used herein, and an implementation plan relative to stormwater discharges was not prepared under Water Code section 13242. In addition, the State Water Resources Control Board (SWRCB) has determined that the federal water quality criteria, such as are contained in the CTR, do "not apply to regulation of storm water discharges." See SWRCB Policy for Implementation of Toxics Standards for the Inland Surface Waters, Enclosed Bays, and Estuaries of California at pg. 1, fn 1; see also CTR Preamble, 65 Fed. Reg. 31682 (5/18/00), which does not identify municipal stormwater as a potentially affected entity. Moreover, these objectives and criteria were never intended to be applied to stormwater discharges at the end of pipe without dilution and mixing being considered. Nevertheless, these objectives and criteria are utilized herein for the purposes of this report.

The Region-wide Permit requires the submittal of water quality monitoring data to the Regional Water Board. As such, all annual water quality monitoring data are provided in **Appendix B**, *2022-2023 Monitoring Results*. The Region-wide Permit also requires that the water quality monitoring data be uploaded to the California Environmental Data Exchange Network (CEDEN) or the Storm Water Multi-Application Reporting and Tracking System (SMARTS) database, when available. Notably, SMARTS is not currently able to accept the formatted data. Thus, only the receiving water data (not urban discharge data) from 2022-2023 has been uploaded just to CEDEN.

The waterbody/drainage shed monitoring results include the following information:

- Sample location and Station type (urban discharge [UD] or receiving water [RW])
- Sampling method (composite or grab)
- Sample date and time
- Sample result
- MDLs and Reporting Limits (RLs)
- Data qualifiers
- Comparison to the lowest applicable water quality objective (WQO)
- Name of the analyzing laboratory

For results that were non-detect (ND), the value is reported as less than the MDL, where the MDL is provided by the lab; otherwise, the value is reported as less than the RL.

Monitoring results for the constituents identified as water quality POCs for Mosher Slough are presented graphically to provide an overview of the characterization of Mosher Slough:

- Dissolved oxygen (**Figure 3**)
- *E. coli* and fecal coliform (**Figure 4**)
- Mercury and Methylmercury (**Figure 5**)

Data for the POCs are summarized in **Appendix C**, *2022-2023 Data Summary Tables*. General observations about the 2022-2023 monitoring year are provided below:

- Dissolved oxygen (DO):
    - DO levels were below the minimum WQO of 5 mg/ L during DW52 and DW53 at MS-13, MS_14, and MS-4D and during DW54 at MS-14.
    - DO levels were generally higher at receiving water sites than discharge sites. DO was measured above the minimum WQO during all dry weather events at both receiving water sites, MS-14RUS and MS-14R.
    - Except for SE81 at MS-14, DO levels were above the minimum WQO during all storm events.
- Indicator bacteria *(E. coli* and fecal coliform):

- *E. coli* and fecal coliform levels varied between sites but were generally similar between receiving water sites and discharge sites.
- *E. coli* and fecal coliform frequently exceeded WQOs during all storm events at all sites.
- Exceedances were more frequent and at higher concentrations during the first dry weather event, DW52, and the first stormwater event, SE81, than later events.

- Mercury and Methylmercury:
  - Mercury levels were well below the WQO of 50 ng/L at all sites, for all events.
  - Methylmercury and mercury measurements did not show major variation across sites and events.

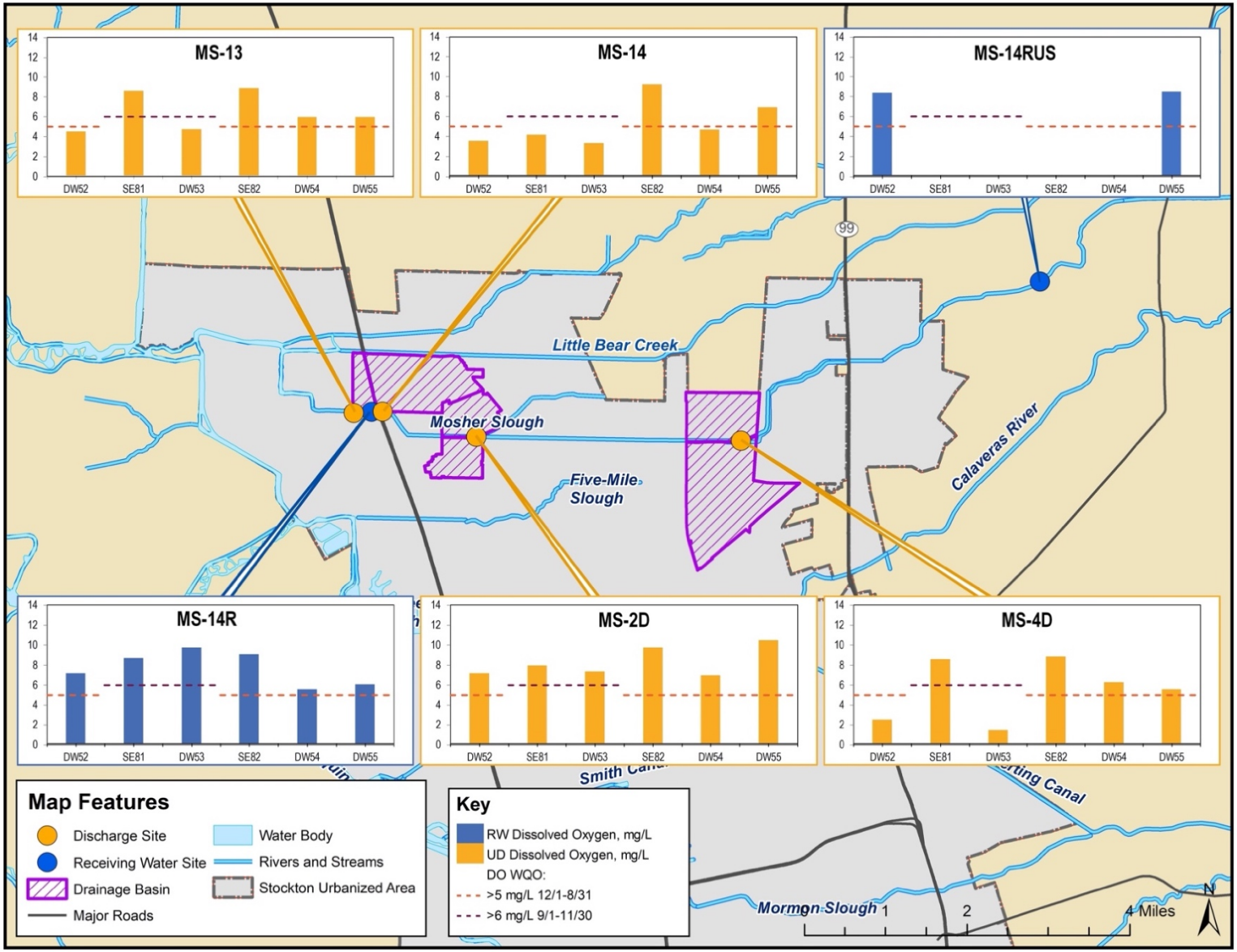

Figure 3. Mosher Slough 2022-2023 Dissolved Oxygen Concentrations (mg/L)

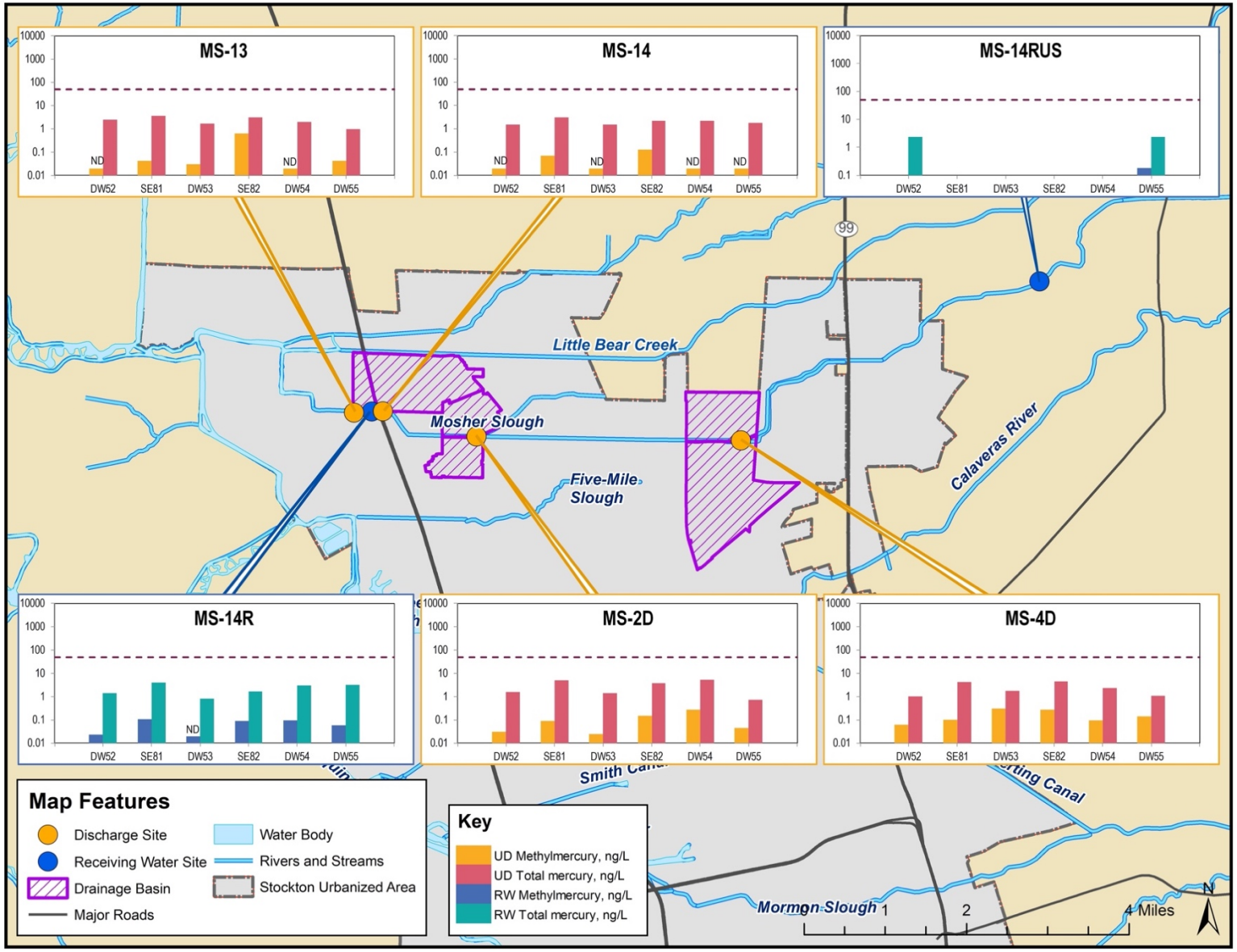

Figure 4. Mosher Slough 2022-2023 Mercury and Methylmercury Concentrations (ng/L)

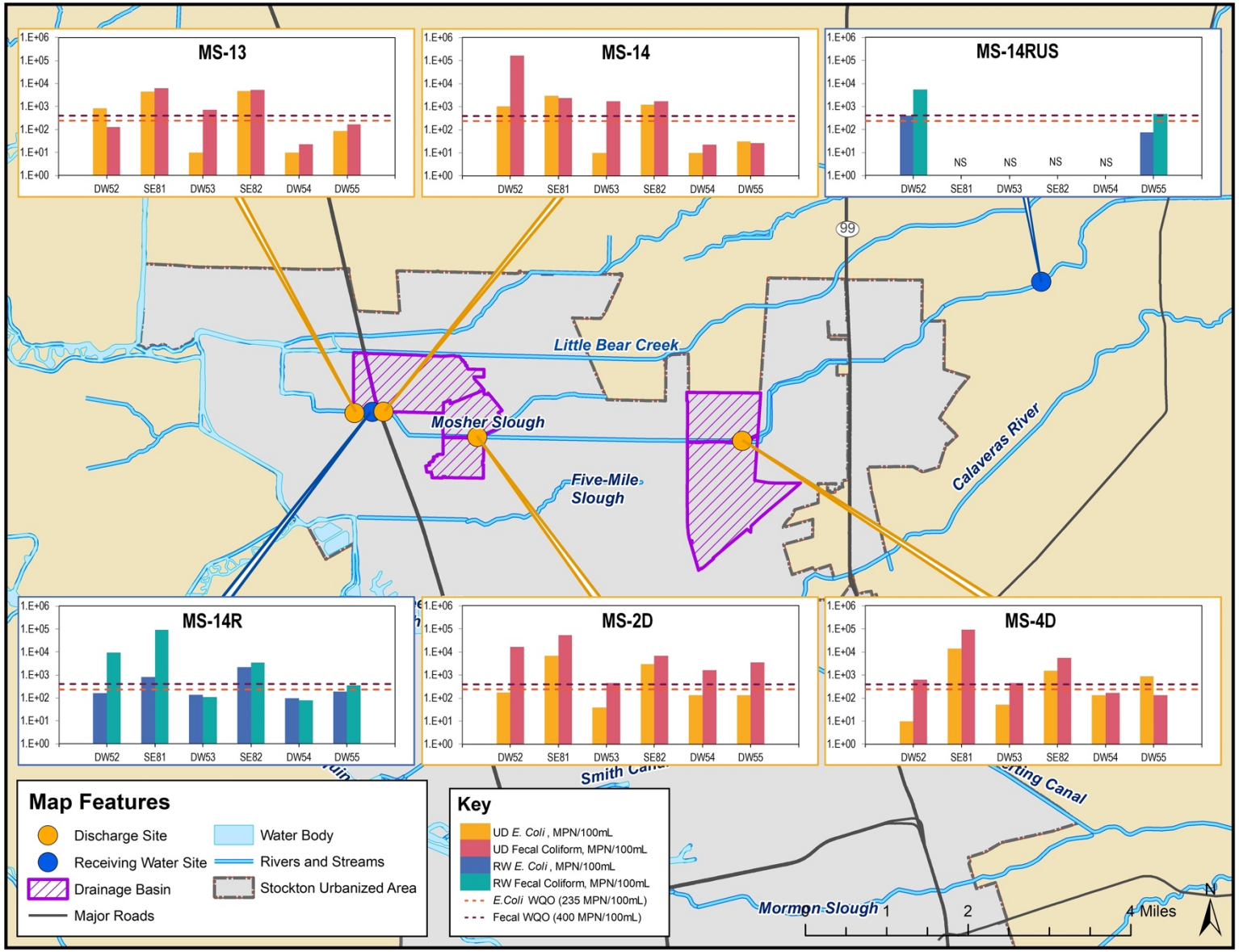

Figure 5. Mosher Slough 2022-2023 *E. Coli* and Fecal Coliform Concentrations (MPN/100mL)

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4.1.3 Rainwater/Atmospheric Deposition Monitoring

During 2022-2023, rainwater/atmospheric deposition was monitored for methylmercury, total mercury, and pesticides (chlorpyrifos and pyrethroids) at two representative locations. The NW rain gage was removed for 2022-2023 monitoring.[16] These two locations are the NE and SC rain gages, shown in **Figure 6**.

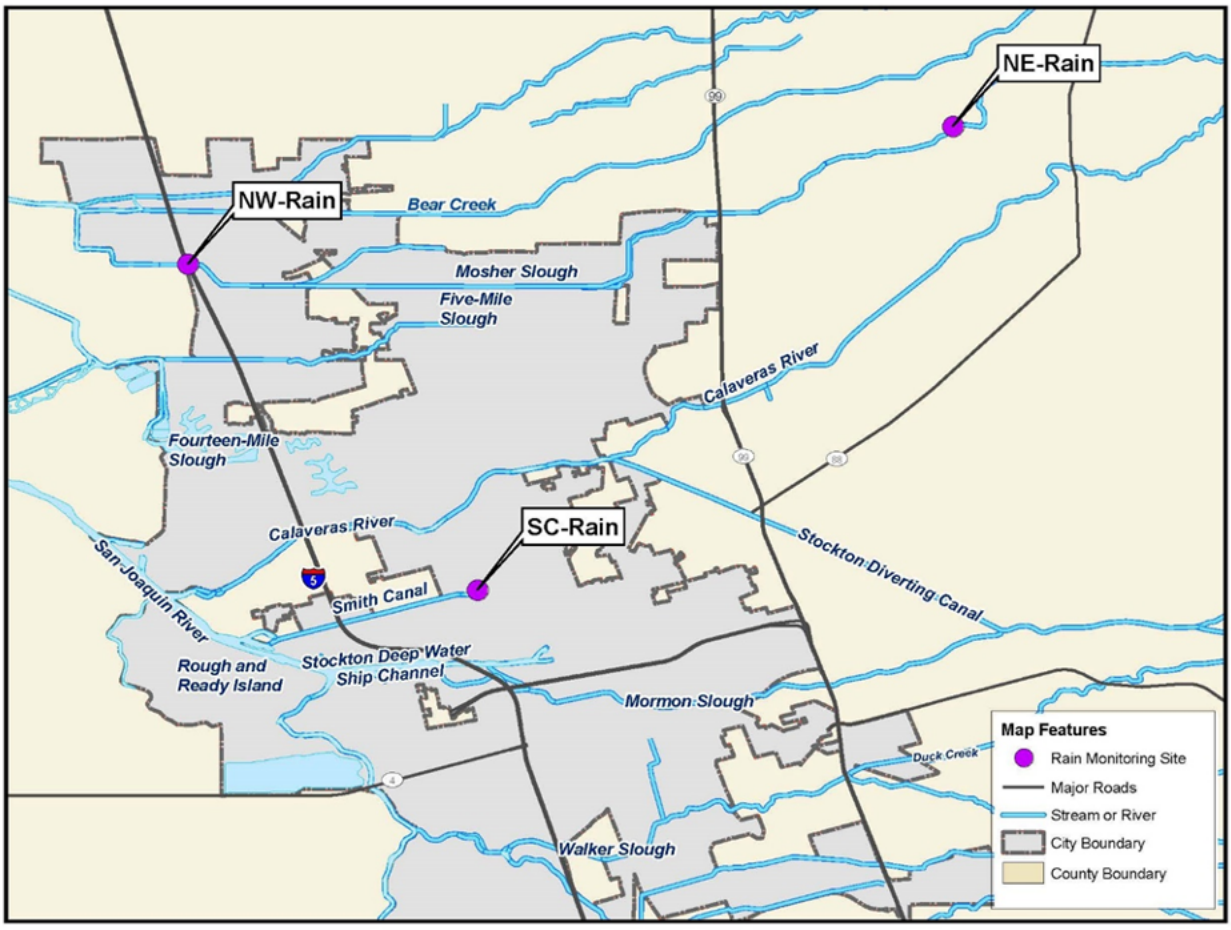

Figure 6. Rainwater/Atmospheric Deposition Monitoring Locations

The monitoring sites include the following:

- NE-Rain – Located along Mosher Slough outside of the SUA, to the northeast. This site has been historically monitored for the Pesticide Plan and is representative of atmospheric deposition generated outside of the urbanized area.
- SC-Rain – Located at the Legion Park Pump Station, in the center of the SUA. This site is representative of atmospheric deposition generated within the urbanized area.

[16] See Response to Request to Modify the City of Stockton & County of San Joaquin's Municipal Separate Storm Sewer System Alternative Monitoring Plan, August 6, 2021.

Rainwater was monitored during both storm events sampled for outfall and receiving water monitoring (SE81 and SE82). Rainwater monitoring results are shown in **Figure 7**. General observations are summarized below:

- Methylmercury and total mercury:
    - Methylmercury concentrations in rainwater were similar at both locations.
    - Total mercury was detected in rainwater at concentrations well below the WQO of 50 ng/L.
- Pesticides:
    - Pyrethroids were detected at both rainfall sites during both storm events.
    - Bifenthrin was the only pyrethroid that was detected.
    - Cyfluthrin, cypermethrin, esfenvalerate/fenvalerate, lambda-cyhalothrin, and permethrin were not detected.
    - Pyrethroid concentrations were similar between rain stations and storm events.

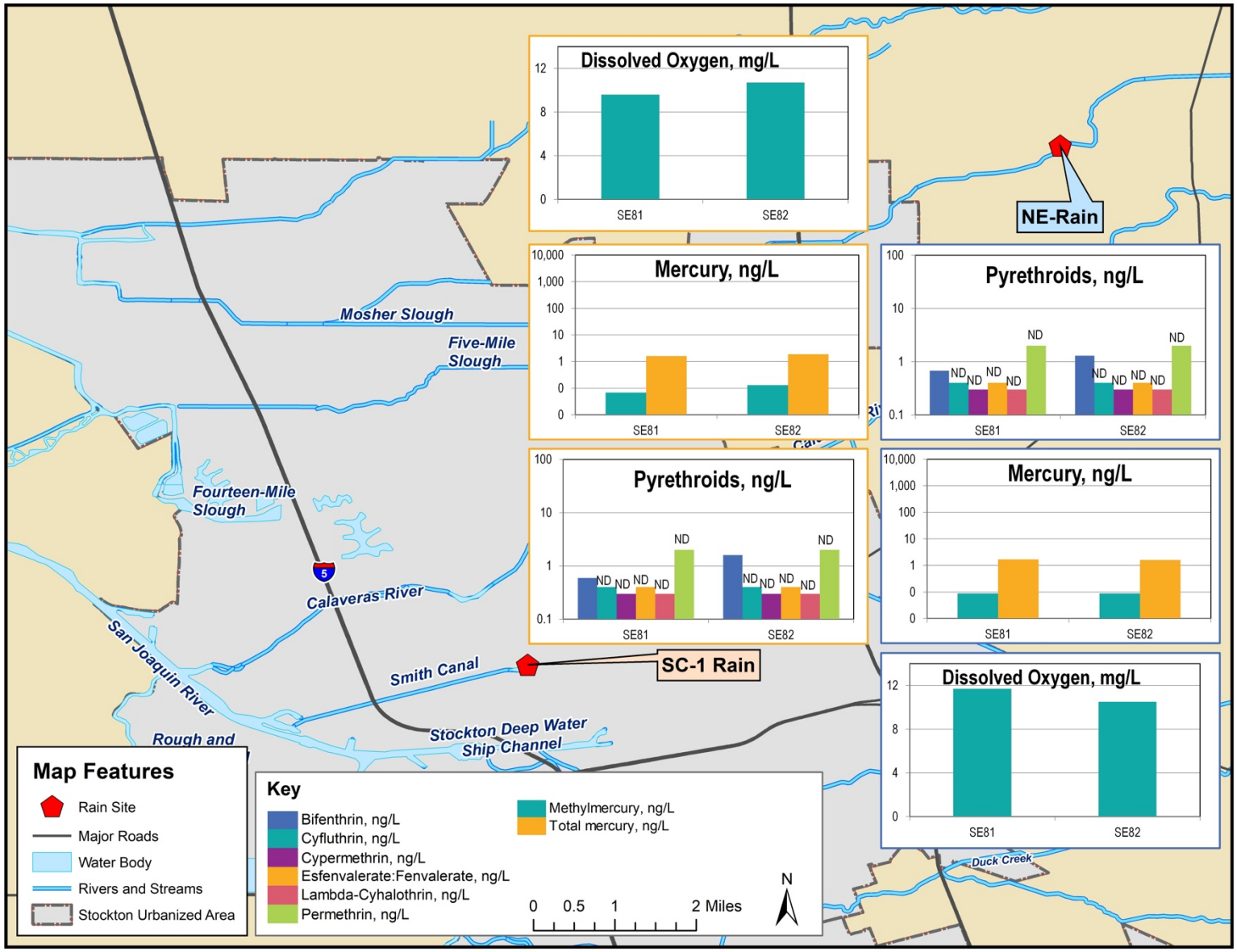

Figure 7. 2022-2023 Rainwater/Atmospheric Deposition Monitoring Results

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4.2 DATA QUALITY EVALUATION

Quality Assurance/Quality Control (QA/QC) refers to the process of reviewing lab and "field" initiated checks on the sampling and analytical process. These checks, which include field blanks, method blanks, field duplicates, lab duplicates, and matrix spike/matrix spike duplicates (MS/MSD), and data review are used to confirm that data are of high quality. Lab reports are initially screened by the field monitoring contractor for missing analytical data (both environmental and QA/QC), holding time exceedances, discrepancies in analytical methods or detection limits, and any apparent out-of-range environmental results. If the analytical work appears to be missing for any requested analyses, the lab is asked to complete the missing analyses, if it is possible to do so within the specified holding time. Periodically, data analyses are requested even if samples exceed the specified hold time. Data qualifiers are appended to the environmental data points, where appropriate, by applying the data quality objectives provided by the laboratories. The QA/QC process allows for the identification of isolated incidents of out-of-range lab and sampling performance, but, more importantly, the process allows for the identification of potential long-term trends in lab and sampling performance. An important and ongoing component of the QA/QC program is to report and correct any identified problems.

Overall, no significant problems with data quality were identified during 2022-2023. In general, the data collected and reported were considered high quality and suitable for data analysis with the qualifications noted in **Appendix B**, *2022-2023 Monitoring Results*. The main qualifiers used are summarized in **Table 14**.

Table 14. Definitions of Commonly Used QA/QC Qualifiers and Instances of Application

Qualifier	Definition of Qualifier	Qualifier Description/ Applicability 2022-2023
FB	The concentration of a given constituent was detected in the field blank. The associated environmental sample taken at the same site is considered an estimate.	No field blanks were collected during 2022-2023 monitoring.
FD	The RPD between the concentrations of a given constituent in the field duplicate and the associated environmental sample was outside the acceptable limit. This indicates that the duplicability and precision of the results for this constituent may be low.	One set of field duplicates were collected for *E. coli*, fecal coliform, total metals, mercury, and methylmercury during the dry weather event DW52. One set of field duplicates were taken for pyrethroids during storm event SE81.
J	The concentration of a given constituent is between the MDL and the RL and is, therefore, an estimated value. The J qualifier does not indicate poor data quality because all the RLs used met permit requirements.	The J-flag qualifier is common in all data in the monitoring program and was frequently applied.
ND	A given constituent was not detected and is recorded as < MDL. The ND qualifier does not indicate poor data quality, but rather indicates that a constituent was simply not detected.	The ND qualifier is common in all data in the monitoring program and was frequently applied.

4.3 DELTA REGIONAL MONITORING PROGRAM

The Delta RMP is a stakeholder-directed project formed to develop a regional water quality monitoring program designed to improve understanding of water quality issues in the Sacramento-San Joaquin Delta. The goal of the Delta RMP is to better coordinate and design current and future monitoring activities in and around the Delta to create a cost-effective approach for providing critically needed water quality information to better inform policy and regulatory decisions of the Regional Water Board and other federal, state, and local agencies and organizations.[17] The Delta RMP focused the initial monitoring efforts on mercury, pesticides, nutrients, and pathogens. The City and County are contributing members of the Delta RMP (**Appendix D**), which commenced monitoring in 2015. Delta RMP monitoring and data evaluation efforts during 2022-2023 continued to focus on mercury, pesticides, and nutrients. The Delta RMP annual monitoring report, *Sacramento-San Joaquin Delta Regional Monitoring Program Annual Report For MS4 Reporting: Fiscal Year 2022-2023*, is also included in **Appendix D**. As the data are collected and results are reported, the City and County will reference this data within the annual reports and future Mid-Term and End-Term Reports, as needed.

[17] http://www.waterboards.ca.gov/centralvalley/water_issues/delta_water_quality/delta_regional_monitoring/index.shtml

4.4 TOTAL MAXIMUM DAILY LOADS

The Region-wide Permit requires the City and County to continue implementation of the stormwater monitoring program, including implementation actions and assessments related to applicable TMDLs. Efforts to fulfill TMDL monitoring requirements (included in Attachment G of the Region-wide Permit) are summarized in the following sections, along with other relevant water quality control programs.

4.4.1 Sacramento-San Joaquin Delta Diazinon and Chlorpyrifos TMDL (Resolution R5-2006-0061)

The Sacramento San Joaquin Delta Diazinon and Chlorpyrifos TMDL was adopted by the Regional Water Board on June 23, 2006 (Resolution R5-2006-0061) and became effective on October 10, 2007. The TMDL establishes waste load allocations (WLAs) for the sum of diazinon and chlorpyrifos concentrations relative to their respective WQOs. Attachment G of the Region-wide Permit requires that, within one year of the receipt of their NOA under the Region-wide Permit, the City and County must submit an assessment to determine the diazinon and chlorpyrifos levels and attainment of WLAs in urban discharge and WQOs in the receiving water. The City and County performed this assessment during 2016-2017 and submitted the information with the Assessment and Prioritization of Water Quality Constituents in the Stockton Urbanized Area.[18] The assessment indicated that, with the exception of Duck Creek, which had limited data, the targets and allocations for the TMDL are largely being met. In addition, Calaveras River, Mosher Slough, and Smith Canal all met the 303(d) delisting criteria. The Regional Water Board approved the assessment in 2020.[19] Calaveras River, Mosher Slough, and Smith Canal were de-listed for diazinon and chlorpyrifos in the 2020-2022 303(d) list.[20]

4.4.2 Central Valley Pyrethroid Pesticides Basin Plan Amendment and TMDL (Resolution R5-2017-0057)

The Central Valley Pyrethroid Pesticides Basin Plan Amendment (BPA) and TMDL were adopted by the Regional Water Board on June 8, 2017 (Resolution R5-2017-0057). The BPA became effective on February 19, 2019, and the TMDL for the nine urban creeks in Sacramento and Roseville became effective on April 22, 2019. This BPA established pyrethroid concentration goals and an implementation program to control pyrethroids in the Sacramento and San Joaquin River watersheds and establishes TMDLs for waterbodies that are 303(d) listed for pyrethroids.

[18] City of Stockton and County of San Joaquin. Assessment and Prioritization of Water Quality Constituents in the Stockton Urbanized Area. Prepared by Larry Walker Associates. May 30, 2017.

[19] Central Valley Regional Water Quality Control Board. Sacramento and San Joaquin Delta Diazinon and Chlorpyrifos Total Maximum Daily Load Attainment Assessment, Dated 30 May 2017. 17 April 2020.

[20] https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2020_2022_integrated_report.html

Accordingly, the Basin Plan requires Baseline Monitoring to be conducted to evaluate pyrethroid concentrations in discharges relative to numeric triggers. The Regional Water Board provided guidance for Baseline Monitoring in their July 30, 2019 Letter to MS4 Dischargers[21]. that was further clarified in its July 13, 2020 13267 Order.[22]

The City and County developed their Pyrethroid Baseline Monitoring Plan and Quality Assurance Project Plan (QAPP) during 2020-2021 and received Regional Water Board approval on June 25, 2021.[23] The City and County conducted Baseline Monitoring during 2021-2022 at the Calaveras River for the following constituents:

- Pyrethroids (bifenthrin, cyfluthrin, cypermethrin, esfenvalerate, lambda-cyhalothrin, permethrin)
- Total and dissolved organic carbon
- *Hyalella azteca* water column toxicity
- *Hyalella azteca* sediment toxicity

Separately from Baseline Monitoring, the City and County identified pyrethroids as a POC in the AMP and, during 2020-2021, monitored pyrethroids at Calaveras River, as described in the *Municipal Stormwater Program 2021-2022 Annual Report*.

Baseline Monitoring results revealed an exceedance of a pyrethroid prohibition trigger, identified on October 22, 2021. As required by the 13267 Order, the City and County developed and submitted a Pyrethroid Monitoring Plan to the Regional Water Board within one year from the date of the exceedance. A joint Management Plan was developed and submitted by the City and the County in October 2022; it was revised in response to Regional Water Board comments and received approval on August 9, 2023.

The 13267 Order also specified that the Baseline Monitoring Report be submitted by September 19, 2022 to the Regional Water Board and include: summary of monitoring results for pyrethroids and toxicity (i.e., water and sediment toxicity to the test organism *Hyalella* Azteca) and an assessment of compliance with the conditional prohibition triggers in the Basin Plan. However, the City and County's request to the Regional Board to remove the requirement for continued Baseline Monitoring and development of a Baseline Monitoring Report was approved on June 10, 2022.[24]

As required by the BPA, the City and County have completed a 2022-2023 Annual Progress Report (**Appendix E**).

[21] Letter from Regional Water Board to All MS4 Dischargers in the Sacramento and San Joaquin River Basins, Pyrethroid Control Program Baseline Monitoring Requirements for Municipal Stormwater Dischargers in the Sacramento and San Joaquin River Basins, July 30, 2019.

[22] Letter from Regional Water Board to City of Stockton, Order to Submit Technical and Monitoring Reports Pursuant to California Water Code Sections 13267 and 13383, July 13, 2020.

[23] Letter from Regional Water Board to the City of Stockton and County of San Joaquin. Approval of the Pyrethroid Baseline Monitoring Plan for the City of Stockton and County of San Joaquin. 25 June 2021.

[24] Letter from the Regional Water Board to the City of Stockton and Count of San Joaquin. Response to Request to Modify the City of Stockton & County of San Joaquin's Municipal Separate Storm Sewer System Alternative Monitoring Plan (WDID#s: S39M1000205 & 5S39M1000204). 10 June 2022.

4.4.3 Stockton Urban Water Bodies Pathogen TMDL (Resolution No. R5-2009-0030)

The Stockton Urban Waterbodies Pathogen TMDL was adopted by the Regional Water Board on March 14, 2008 (Resolution R5-2008-0030) and became effective on May 13, 2008. The TMDL includes WLAs for fecal coliform and *E. coli*. Attachment G of the Region-wide Permit requires that the City and County continue monitoring and document, in Mid-Term and End-Term Reports, the implementation of BMPs to control the discharge of pathogens (indicator bacteria) in their urban discharge, as well as submit effectiveness assessments of implemented BMPs. These efforts were reported in the *Municipal Stormwater Program 2016-2021 End-Term Report*. During 2022-2023, the City and County monitored for indicator bacteria Mosher Slough, as described in **Section 4.1.2**.

4.4.4 Delta Methylmercury TMDL (Resolution No. R5-2010-0043)

The Sacramento-San Joaquin Delta Methylmercury TMDL was adopted by the Regional Water Board on April 22, 2010 (Resolution R5-2010-0043) and became effective on October 20, 2011. This TMDL for mercury and methylmercury consists of two phases.

- Phase 1 of the TMDL was from October 20, 2011 through October 20, 2020 and focused on control studies and pilot projects to develop and evaluate management practices to control methylmercury.

The City and County conducted a Methylmercury Control Study (Control Study), which evaluated mercury and methylmercury removal performance of a detention basin, along with the potential for methylmercury formation within the basin and achievement of the WLAs. The *Methylmercury Control Study Final Report* was submitted to the Regional Water Board on October 19, 2018 and approved by the Regional Water Board on June 19, 2020. The City and County also participated in the Mercury Exposure Reduction Program (MERP). This program is discussed in **Section 4.4.4.1**.

The Regional Water Board is continuing to conduct its review of the TMDL and evaluating the fish tissue objectives, the linkage analysis, and attainability of the allocations and adjusting the objectives, allocations, linkage analysis, and schedule.

- Phase 2 will begin after the Phase 1 review or October 20, 2022, whichever occurs first and will end in 2030.

In addition, Attachment G of the Region-wide Permit requires the submittal of a plan for methylmercury monitoring within one year of the Delta Mercury Control Program review or 20 October 2022, whichever date occurs first for Executive Officer approval. A letter from the Regional Water Board on August 31, 2023, clarified requirements for dischargers with assigned waste load allocations. The letter recognized the time and resources required to initiate Methylmercury Management Plans by October 2023, as well as the time required for Regional

Water Board review of the plans, and acknowledged that the Regional Water Board would not be acting on this requirement.[25]

In June 2015, the City and County submitted an Alternative Monitoring Program (AMP) that directed resources to the most critical water quality issues, including methylmercury. The AMP describes the monitoring locations, timeframes, and constituents. The AMP was approved by the Executive Officer (EO) in November 2015. Since the AMP includes the plan for the continued methylmercury monitoring and was approved by the Regional Water Board EO, the requirement in Attachment G has been met.

4.4.4.1 Delta Mercury Exposure Reduction Program Participation

The Delta Mercury Control Program requires the entities identified in the Basin Plan to develop and implement a MERP. The Delta MERP participants include those entities and agencies that formally submitted a letter describing their intent to participate in the collective exposure reduction program. The City and County submitted their letter during 2013-2014 and participated in the Delta MERP through its six-year duration that ended during 2019-2020. Activities under the MERP are discussed in previous annual reports and the *Municipal Stormwater Program 2016-2021 End-Term Report*. Although the Delta MERP ended in 2019-2020, the Regional Water Board continues to make limited materials available to past contributors and community groups by request.

4.4.5 Lower San Joaquin River, Stockton Deep Water Ship Channel Organic Enrichment and Low Dissolved Oxygen TMDL (Resolution No. R5-2005-0005)

The Lower San Joaquin River Dissolved Oxygen TMDL was adopted by the Regional Water Board on January 27, 2005 (Resolution R5-2005-0005) and became effective on February 27, 2007. The TMDL requires that responsible parties implement BMPs to control and abate the discharge of oxygen-demanding substances. Attachment G of the Region-wide Permit requires covered City and County to continue implementation of BMPs identified in their SWMP to control oxygen-demanding substances in their stormwater discharges. These implementation efforts were reported in the Municipal Stormwater Program 2016-2021 End-Term as required under the Region-wide Permit. During 2022-2023, the City and County monitored for dissolved oxygen at Mosher Slough using grab samples, as described in **Section 4.1.2**.

4.4.6 Trash Implementation

The Statewide Trash Amendments[26] were adopted by the State Water Resources Control Board on April 7, 2015 (Resolution 2015-0019) and became effective on December 2, 2015. The Trash Amendments require MS4 permittees to comply with the prohibition of trash discharge through Track 1 or Track 2.

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[25] Letter from Regional Board to City of Stockton and County of San Joaquin. City of Stockton & County of San Joaquin Phase I Municipal Separate Storm Sewer System. August 31, 2023.

[26] Proposed Final Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California (ISWEBE Plan).

The Regional Water Board issued a Water Code section 13383 Order on June 1, 2017, requiring the City to submit a letter identifying the selected compliance option (Track 1 or Track 2) by September 1, 2017. The City selected the Track 2 compliance method (full capture system equivalency).

The County's jurisdiction includes both Phase I and Phase II urbanized areas. Prior to February 2022[27], the County was subject to two separate stormwater permits: the Region-wide Permit and the Phase II Small Municipal Separate Storm Sewer System (MS4) General Permit[28] (Phase II Permit) issued by the State Water Board. The County received the Water Code section 13383 Order issued by the Regional Board (June 1, 2017), as well as a Water Code section 13383 Order issued by the State Water Board (June 1, 2017). The County responded to both orders by selecting the Track 2 approach to compliance and submitting the preliminary jurisdictional maps required for Phase II areas.

The City and County each submitted Trash Implementation Plans[29,30] to the Regional Water Board on December 1, 2018, that included the following:

a. A description of the combination of controls selected and the rationale for the selection;
b. The rationale for how the combination of controls is designed to achieve Full Capture System Equivalency (FCSE); and
c. The rationale for how FCSE will be demonstrated.

The City and County have completed baseline assessments and are currently implementing their respective 2018 Trash Implementation Plans within their jurisdictions. Results will be reported in future annual reports and as required by the Region-wide Permit upon reissuance.

[27] Letter from Regional Water Board to the County of San Joaquin. Amended Notice of Applicability; General Permit for Discharges from Municipal Separate Storm Sewer Systems, Order R5-2016-0040. 11 February 2022. After this date, the County was no longer subject to the Phase II Permit and is solely regulated by the Region-wide Permit for stormwater discharges from its Phase I and Phase II areas.

[28] Order No. 2013-001-DWQ, effective July 1, 2013.

[29] City of Stockton, 2018. Statewide Trash Amendments: Track 2 Implementation Plan. December.

[30] County of San Joaquin, 2018. Statewide Trash Amendments: Track 2 Implementation Plan. December.

5. PROGRAM IMPLEMENTATION

Consistent with Attachment H to the Region-wide Permit (*Standard Permit Provisions and General Provisions*),[31] this section provides a summary of the status of the implementation of the stormwater program, focusing on the number and nature of inspections, enforcement actions, and public education programs during 2022-2023.

As described in **Section 2**, the City and County submitted a NOI Work Plan as part of their NOI application package (**Appendix A**, *2016 NOI Work Plan*). During 2022-2023, the City and County implemented the activities outlined in the 2016 NOI Work Plan.

In addition, throughout the reporting period, the City and County tracked the data and information necessary to conduct short-term and long-term program effectiveness assessments. The short-term program effectiveness assessment was included in the *2016-2019 Mid-Term Report*. The long-term program effectiveness assessment was included in the completed as part of the *2016-2021 End-Term Report*.

[31] Attachment H includes applicable provisions from 40 CFR §122.41 and 40 CFR §122.42.

5.1 CITY PROGRAM IMPLEMENTATION

5.1.1 Inspections (City)

5.1.1.1 Industrial and Commercial Program Element (IC)

The City prioritizes all industrial facilities, and commercial facilities that may be significant sources of pollutants as high priority and inspects each facility twice during the five-year permit term.

The inspection results for industrial facilities in 2022-2023 are shown in **Table 15**.

Table 15. Summary of Industrial Inspections (City)

Data/Information Tracked	Total Number
Industrial facilities in current inventory	97
Facilities prioritized as high	97
Facilities inspected during the reporting period	97
Facilities with SWPPPs on site[a]	85
Facilities in compliance with stormwater control requirements	84
Facilities requiring follow-up inspections	3
Facilities in compliance after follow-up inspections	3

[a] The number of facilities with SWPPPs on site is tabulated as the total number of facilities minus the number with "SWPPP not on site" written in the inspector comments.

The inspection results for commercial facilities in 2022-2023 are shown in **Table 16**.

Table 16. Summary of Commercial Inspections (City)

Data/Information Tracked	Total Number
Commercial facilities in current inventory	1,644
Facilities prioritized as high and requiring inspection	1,644
Facilities inspected during the reporting period	106
Facilities adequately implementing BMPs[a]	62
Facilities in general compliance[a]	62
Facilities requiring follow-up inspections[b]	7
Facilities in compliance after follow-up inspections	7

[a] City inspectors use a defined checklist to evaluate the results of commercial facility inspections. Five categories are scored between 0-5, where 0 represents lack of information, 1-2 are passing, and 3-5 represent serious deficiencies. The number of facilities adequately implementing BMPs and in general compliance is tabulated as the number of facilities that pass the inspection, those which have no issues, or those which have an inspection score no greater than 2 for the following four inspection categories: "Facility Structure", "Waste Management", "Fluid Management", and "Illicit Connections". Inspections that receive a score of 3 in any of these four inspection categories are considered to be "out of general compliance". Storm drain-

related issues that result in failing scores were not tallied because they are property owner issues (not business-related). A correction order is sent to the property owner for any storm drain-related issues observed during an inspection.

[b] Commercial facilities with multiple or egregious BMP implementation failures are re-inspected. Commercial facilities with minor BMP implementation failures are issued a Notice of Warning and documentation is required to show compliance in lieu of a follow-up inspection. A single enforcement action may be sent to the owner of multiple properties.

5.1.1.2 Construction Program Element (CO)

The City inspects all construction sites greater than or equal to one (1) acre during the wet and dry seasons. The inspection program ensures that the specific minimum requirements are effectively implemented at construction sites.

A summary of the active construction sites and inspections conducted by the City in 2022-2023 is shown in **Table 17**.

Table 17. Summary of Construction Site Inspections (City)

Data/Information Tracked	Total Number
Active construction sites ≥1 acre in size[a]	80
Regular inspections conducted at active construction sites	781
Follow-up inspections conducted due to violations	21
Repeat offenders	9

[a] The number of active construction sites includes sites that were active at any time during the fiscal year.

5.1.1.3 Planning and Land Development Program Element (LD)

The City performs post-construction BMP maintenance oversight to ensure that post-construction BMPs continue to function correctly and minimize water quality impacts.

The number of completed priority projects with post-construction BMPs and the number of inspections conducted in 2022-2023 are shown in **Table 18**.

Table 18. Post-Construction BMP Inspections (City)

Data/Information Tracked	Total Number
Completed priority projects with post-construction BMPs	19
Inspections conducted on priority projects	11

5.1.2 Enforcement (City)

5.1.2.1 Illicit Discharges Program Element (ID)

The Enforcement Control Measure establishes policies and procedures and outlines the progressive levels of enforcement applied to responsible parties not complying with City ordinances. By adopting and implementing a progressive enforcement policy, the City ensures that the program is effectively prohibiting and reducing illicit discharges and illegal connections. The City tracked enforcement actions in the Illicit Discharges Database.

A total of 56 illicit discharge complaints were verified by the City during 2022-2023. Two repeat offenders were identified. Three referrals were made to the Regional Water Board by the City

due to compliance issues during 2022-2023. The number and types of enforcement actions taken by the City during 2022-2023 are summarized in **Table 19**.

Table 19. Illicit Discharge Program Enforcement Actions Taken (City)

Type of Enforcement Action	Number of Actions
Administrative	
Verbal Warning	0
Violation Warning Notice	10
Notice of Violation	12
Correction Order	0
Notice to Clean	0
Cease and Desist Order	0
Stop Work Order	0
Administrative Citation (Fine)	0
Criminal Enforcement[a]	
Misdemeanor	0
Infraction	0
Total	**22**

[a] This category presumes that an action turned over to the District Attorney resulted in a criminal prosecution within the year of the incident. However, data for this category can only be updated in subsequent years (i.e., after criminal prosecution has been successful).

5.1.2.2 Industrial and Commercial Program Element (IC)

The Enforcement Control Measure outlines the progressive levels of enforcement applied to industrial and commercial facilities that are out of compliance with local ordinances and establishes the protocol for referring apparent violations of facilities subject to the Industrial General Permit to the Regional Water Board.

The number and types of enforcement actions taken by the City during 2022-2023 are summarized in **Table 20**. No repeat offenders were identified and two referrals were made to the Regional Water Board by the City during 2022-2023.

Table 20. Industrial and Commercial Program Enforcement Actions Taken (City)

Type of Enforcement Action	Number of Actions[a]
Administrative	
Violation Warning Notice	50
Notice of Violation	9
Cease and Desist Order	2
Stop Work Order	0
Administrative Citation (Fine)	0
Criminal Enforcement[b]	
Misdemeanor	0
Infraction	0
Total	**61**

[a] The total number of enforcement actions taken may be smaller than the number of facilities with inadequate BMPs due to enforcement actions that are issued to the owners of multiple properties.

[b] This category presumes that an action turned over to the District Attorney resulted in a criminal prosecution within the year of the incident. However, data for this section can only be updated in subsequent years (i.e., after criminal prosecution has been successful).

5.1.2.3 Construction Program Element (CO)

The Enforcement Control Measure outlines the progressive levels of enforcement applied to construction sites that are out of compliance with local ordinances and establishes the protocol for referring apparent violations of construction sites subject to the General Construction Permit to the Regional Water Board. The progressive enforcement and referral policy, as well as the accompanying legal authority to execute this policy, is an important tool for providing a fair and equitable approach to bringing contractors and developers into compliance with the City's municipal code requirements.

The number and types of enforcement actions taken by the City in 2022-2023 during construction site inspections are summarized in **Table 21**. Nine repeat offenders (unique construction sites) were identified, and no referrals were made to the Regional Water Board by the City during 2022-2023.

Table 21. Construction Program Enforcement Actions Taken (City)

Type of Enforcement Action	Number of Actions
Administrative	
Violation Warning Notice	114
Notice of Violation	14
Cease and Desist Order	0
Stop Work Order	0
Administrative Citation (Fine)	0
Criminal Enforcement	
Misdemeanor	0
Infraction	0
Total	**128**

5.1.2.4 Planning and Land Development Program Element (LD)

The City takes enforcement actions during post-construction BMP inspections.

The number and types of enforcement actions taken by the City in 2022-2023 during construction site inspections are summarized in **Table 22**.

Table 22. Post-Construction BMP Inspections and Enforcement (City)

Data/Information Tracked	Total Number
Inspections conducted on priority projects	11
Enforcement actions taken	5

5.1.3 Public Education (City)

5.1.3.1 Public Outreach Program Element (PO)

The City implemented a number of public education and outreach programs during the 2022-2023 reporting period. A summary of these efforts is provided below.

- **Conduct Mixed Media Campaigns:** The City conducted four mixed media campaigns for the general public that reached an estimated total of 137,080 people. These efforts included a video promoting storm drain marker installation that aired regularly on Channel 97 and a cable television channel devoted to the Stockton City government; outfield signage at the Stockton Ports Baseball stadium; the broadcast of a storm drain marker educational video on the City of Stockton YouTube channel; and utility bill inserts to water service customers.
- **Participate in Community-Wide Events:** The City conducted four community-wide events with an estimated 12,720 total attendees.
- **Provide Outreach to School-Age Children:** SAWS held 343 events at Stockton area schools, reaching an estimated 10,604 students. The City held an additional two events, including AgVenture 2023 and the Classroom Aquarium Education Program ("Salmon in the Classroom") which reached 3,000 students. A total of 13,604 students were reached.
- **Distribute Educational Material to Selected Businesses:** The City distributed an estimated 80 BMP Fact Sheets to high priority commercial businesses (i.e., 30 to automotive-related facilities and 50 to restaurants/food service establishments) and 97 BMP Fact Sheets to industrial facilities in 2022-2023.

5.2 COUNTY PROGRAM IMPLEMENTATION

5.2.1 Inspections (County)

5.2.1.1 Industrial and Commercial Program Element (IC)

The County prioritizes all industrial and commercial facilities that may be significant sources of pollutants as high priority and inspects each facility twice during the five-year permit term.

The inspection results for industrial facilities in 2022-2023 are shown in **Table 23**.

Table 23. Summary of Industrial Inspections (County)

Data/Information Tracked	Total Number
Industrial facilities in current inventory	48
Facilities prioritized as high[a]	29
Facilities inspected during the reporting period[b]	15
Facilities with SWPPPs on site	15
Facilities in compliance with stormwater control requirements[c]	14
Facilities requiring follow-up inspections	0

[a] The number of facilities prioritized as "high" does not include three sites inspected by the City: 10 sites with a No Exposure Certification (NEC); and five sites that have filed a Notice of Termination (NOT); thus, the value is lower than the total number of facilities in the inventory.
[b] This value accounts only for facilities prioritized as "high" and inspected. The County intends to inspect the remaining industrial facilities during 2023-2024.
[c] One site did not have site map, but this was provided within 24 hours. No follow-up was required.

The inspection results for commercial facilities in 2022-2023 are shown in **Table 24**.

Table 24. Summary of Commercial Inspections (County)

Data/Information Tracked	Total Number
Commercial facilities in current inventory	97
Facilities prioritized as high and requiring inspection	97
Facilities inspected during the reporting period[a]	87
Facilities requiring follow-up inspections	6
Facilities in compliance after follow-up inspections	0[b]

[a] The County intends to inspect the remaining commercial facilities during 2023-2024.
[b] The inspections were conducted at the end of the 2022-2023 fiscal year; follow-up inspections for six facilities will be conducted in 2023-2024.

In past years, as part of the commercial business inventory and inspection efforts and on behalf of both the City and County, the County has implemented and tracked the Self-Certification program for mobile carpet cleaning businesses. This will be continued in 2023-2024.

5.2.1.2 Construction Program Element (CO)

The County inspects all construction sites greater than or equal to one (1) acre during the wet and dry seasons. The inspection program ensures that the specific minimum requirements are effectively implemented at construction sites.

A summary of the active construction sites and inspections conducted by the County in 2022-2023 is shown in **Table 25**.

Table 25. Summary of Construction Site Inspections (County)

Data/Information Tracked	Total Number
Active construction sites ≥1 acre in size[a]	29
Regular inspections conducted at active construction sites	50
Follow-up inspections conducted due to violations	4
Repeat offenders	0

[a] The number of active construction sites in the Phase I and Phase II urbanized areas includes sites that were active at any time during the fiscal year.

5.2.1.3 Planning and Land Development Program Element (LD)

The County performs post-construction BMP maintenance oversight to ensure that post-construction BMPs continue to function correctly and minimize water quality impacts. The County had a total of one completed priority project with post-construction BMPs. Eight inspections were conducted, and no enforcement actions were issued due to improper maintenance.

5.2.2 Enforcement (County)

5.2.2.1 Illicit Discharge Program Element (ID)

The Enforcement Control Measure establishes policies and procedures and outlines the progressive levels of enforcement applied to responsible parties not complying with County ordinances. By adopting and implementing a progressive enforcement policy, the County ensures that the program is effective at reducing illicit discharges and illegal connections.

Three illicit discharge complaints were verified by the County during 2022-2023, and one notice to clean was issued. No repeat offenders were identified. Two referrals were made to the Environmental Health Department by the County during 2022-2023.

5.2.2.2 Industrial and Commercial Program Element (IC)

The Enforcement Control Measure outlines the progressive levels of enforcement applied to industrial and commercial facilities that are out of compliance with local ordinances and establishes the protocol for referring apparent violations of facilities subject to the Industrial General Permit to the Regional Water Board.

The number and types of enforcement actions taken by the County in 2022-2023 are summarized in **Table 26.** No repeat offenders were identified, and no referrals were made to the Regional Water Board by the County during 2022-2023.

Table 26. Industrial and Commercial Program Enforcement Actions Taken (County)

Type of Enforcement Action	Number of Actions
Verbal Warnings[a]	1
Written Warnings	0
Administrative Remedies	
Warning or Notice to Clean	0
Notice of Violation	0
Legal Action	
Misdemeanor	0
Infraction	0
Total	**1**

[a] One industrial site did not have site map, but this was provided within 24 hours. No follow-up was required.

5.2.2.3 Construction Program Element (CO)

The Enforcement Control Measure outlines the progressive levels of enforcement applied to construction sites that are out of compliance with local ordinances and establishes the protocol for referring apparent violations of construction sites subject to the General Construction Permit to the Regional Water Board. The progressive enforcement and referral policy, as well as the accompanying legal authority, is an important tool for ensuring a fair and equitable approach to bringing contractors and developers into compliance with the County Code and ordinance requirements. The number and types of enforcement actions taken by the County in 2022-2023 are summarized in **Table 26.** No repeat offenders were identified, and no referrals were made to the Regional Water Board by the County during 2022-2023.

Table 27. Construction Program Enforcement Actions Taken (County)

Type of Enforcement Action	Number of Actions
Verbal Warnings	4
Written Warnings	0
Administrative Remedies	
Warning or Notice to Clean	2
Notice of Violation	2
Legal Action	
Misdemeanor	0
Infraction	0
Total	**8**

5.2.3 Public Education (County)

5.2.3.1 Public Outreach Program Element (PO)

The County implemented a number of public education and outreach programs during the 2022-2023 reporting period. A summary of these efforts is provided below.

- **Conduct Mixed Media Campaigns:** The County conducted six mixed media campaigns for the general public. These efforts included radio advertisements in English and Spanish, radio public service announcements, and a video advertisement. An estimated total of 5,985,548 impressions were made through these campaigns.
- **Participate in Community-Wide Events:** The County was not able to conduct community-wide events in 2022-2023 due to staffing shortages.
- **Provide Outreach to School-Age Children:** SAWS held seven events at schools, reaching an estimated 233 students.
- **Distribute Educational Material to Selected Businesses:** The County distributed 71 BMP Fact Sheets to high-priority commercial businesses in 2022-2023 (24 to automotive-related facilities and 47 to restaurants/food service establishments).

6. PROPOSED SWMP MODIFICATIONS

The 2022-2023 Annual Report has been developed during the period when the RAA remains under review by the Regional Water Board and the revised SWMP is in progress. As a part of the SWMP development process, the City and the County will qualitatively evaluate the effectiveness of the stormwater program over time, as well as the experience that staff has had in implementing the program, to identify potential modifications. No specific modifications are identified within the 2022-2023 Annual Report.

APPENDIX

Appendices for the Municipal Stormwater Program 2022-2023 Annual Report

APPENDIX A

NOI Work Plan as Submitted November 1, 2016

City of Stockton and County of San Joaquin SWMP Annual Work Plan

ID	Task Name	Q3	Q4	Q1	Q2
1	**Section 1 - Program Management**				
2	**Program Coordination**				
3	Review/revise SWMP as needed				
4	Co-permittees meet quarterly				
5	Participate in internal quarterly Stormwater Program Meetings				
6	Participate in statewide stormwater-related meetings, conferences, and stakeholder groups as needed				
7	Review/revise MOUs as necessary				
8	Establish, review, and revise cooperative agreements as needed				
9	**Fiscal Analysis**				
10	Review and revise the Fiscal Analysis reporting format as needed				
11	**Legal Authority**				
12	Review the legal authority as needed				

ID	Task Name	Q3	Q4	Q1	Q2
13	**Section 2 - Illicit Discharges Program Element (ID)**				
14	**ID1 - Detection of Illicit Discharges and Illegal Connections**				
15	Public Reporting				
16	Maintain and advertise Hotline				
17	Coordinate with other agencies and departments				
18	Field Crew Inspections				
19	Continue field observations for IDIC				
20	**ID2 - Illegal Connection Identification and Elimination**				
21	Investigate and eliminate illegal connections				
22	Coordinate with Planning and Land Development program				
23	Coordinate with Construction program				
24	**ID3 - Investigation/Inspection and Follow Up**				
25	Respond to illicit discharges				
26	Maintain contractual services for incident clean-up				
27	Maintain Illicit Discharges Database				
28	**ID4 - Enforcement**				
29	Implement progressive enforcement policy and procedures				
30	Track enforcement actions in Illicit Discharges Database				
31	**ID5 - Training**				
32	Conduct training				

ID	Task Name	Q3	Q4	Q1	Q2
33	**Section 3 - Public Outreach (PO)**				
34	**PO1 - Public Participation**				
35	Implement Storm Drain Marker Program				
36	Organize, support, and/or participate in stream cleanup events				
37	Promote Used Oil and Household Hazardous Waste Programs				
38	Coordinate with Household Hazardous Waste program for pesticide disposal				
39	**PO2 - Hotline**				
40	Maintain 24-hr hotline number				
41	Promote/publicize the 24-hr hotline				
42	**PO3 - Public Outreach Implementation**				
43	Update Website as needed				
44	Implement pet waste outreach program				
45	Track installation of pet waste bag dispensing stations				
46	Participate in community-wide events throughout the year				
47	Conduct mixed media campaigns				
48	Provide community relations				
49	Implement pesticide outreach efforts for staff, residents, retail stores, and PCOs				
50	**PO4 - Public School Education**				
51	Continue to identify opportunities to reach out to school age children				

ID	Task Name	Q3	Q4	Q1	Q2
52	**Section 4 - Municipal Operations (MO)**				
53	**MO1 - Sanitary Sewer Maintenance & Overflow and Spill Response**				
54	Implement the Sanitary Sewer Overflow Emergency Response Plan (SSOERP)				
55	Review the SSOERP and revise as changes occur				
56	**MO2 - Construction Requirements for Municipal Capital Improvement Projects**				
57	Review CIP designs to ensure specifications and notes are included				
58	Require submission of NOI for CIPs greater than or equal to one acre				
59	If a priority project, develop in conformance with the SWQCCP				
60	Improve interdepartamental communication to facilitate accurate recordkeeping and reporting of data				
61	**MO3 - Pollution Prevention at City Facilities**				
62	Assess facilities to determine if they require coverage under the General Industrial Permit				
63	Implement SWPPP/FPPP for Corporation Yard and other facilities as needed				
64	Review CIP projects for compliance with general stormwater requirements, including review for vehicle or equipment wash areas				
65	**MO4 - Landscape and Pest Management**				
66	Implement pesticide and fertilizer application protocol at park sites, landscaped medians, and golf courses				
67	Implement IPM program				
68	Maintain and expand internal inventory on pesticide use and track Parks Division reported pesticide use				
69	Implement Landscaping Standards				
70	**MO5 - Storm Drain System Maintenance**				
71	Implement storm drain system mapping				
72	Review/revise prioritization for catch basin cleaning as needed				
73	Maintain and annually update Catch Basin Database				
74	Implement catch basin maintenance program				
75	Implement pump station maintenance program				
76	Implement detention basin maintenance program				
77	Implement notification procedures for ID/IC and missing catch basin markers or illegible stencils				
78	Require large events and venues to address trash and debris removal, including containerization and street sweeping as appropriate				

ID	Task Name	Q3	Q4	Q1	Q2
79	**MO6 - Street Cleaning and Maintenance**				
80	Implement street sweeping program				
81	Review/revise prioritization of streets for street sweeping program as needed				
82	Implement green waste collection program				
83	Implement Maintenance Staff Guide -- Road Maintenance and Small Construction BMPs				
84	**MO7 - Training**				
85	Conduct training				
86	**Section 5 - Industrial and Commercial Program Element (IC)**				
87	**IC1 - Facility Inventory**				
88	Internal audit of database				
89	Maintain and annually update the inventory and database				
90	Map the industrial and commercial facilities on an annual basis				
91	Implement and track a self-certification program for carpet cleaners				
92	**IC2 - Prioritization and Inspection**				
93	Prioritization				
94	Prioritize facilities as necessary				
95	Inspections				
96	Review/revise industrial inspection checklists as needed				
97	Conduct inspections				
98	Conduct follow-up inspections as needed				
99	**IC3 - BMP Implementation**				
100	Review/revise BMP fact sheets for high priority facilities as needed				
101	Distribute BMP Fact Sheets				
102	Implement outreach efforts to carpet cleaners				
103	**IC4 - Enforcement**				
104	Implement progressive enforcement and referral policy and procedures				
105	Track enforcement actions in the industrial/commercial database				
106	Implement procedures for Regional Water Board based complaints				
107	Review and Revise Industrial General Permit referral policy as needed				
108	**IC5 - Training**				
109	Conduct training				

ID	Task Name	Q3	Q4	Q1	Q2
110	**Section 6 - Construction (CO)**				
111	**CO1 - Municipal Code for Construction Sites**				
112	**CO2 - Plan Review and Approval Process**				
113	Review grading and building permit applications for SWPPP requirements				
	Review erosion control plans				
114	Distribute the Plan & Permit Application Review Procedure handout				
115	**CO3 - Construction Projects Inventory**				
116	Maintain and update the Construction Project Database				
117	**CO4 - Construction Outreach**				
118	Distribute appropriate BMP fact sheets during inspections				
119	**CO5 - Construction Site Inspections & BMP Implementation**				
120	Inspect construction sites >=1 acre monthly				
121	**CO6 - Enforcement**				
122	Implement progressive enforcement policy				
123	Track enforcement actions using the construction database				
124	**CO7 - Training**				
125	Conduct training				

ID	Task Name	Q3	Q4	Q1	Q2
126	**Section 7 - Planning and Land Development (LD)**				
127	**LD1 - Incorporation of Water Quality Protection Principles into City Procedures and Policies**				
128	Revise General Plan as needed				
129	**LD2 - New Development Standards**				
130	Require priority projects to comply with the revised SWQCCP				
131	**LD3 - Plan Review Sign-off**				
132	Revise Post-Construction Plan Review Database as needed				
133	Use Post-Construction Plan Review Database				
134	Review project plans and grading plans for stormwater BMPs				
135	Track projects with post-construction treatment control BMPs				
136	Conduct inspections of completed priority projects to ensure that all approved control measures have been implemented and are being maintained				
137	**LD4 - Maintenance Agreement and Transfer**				
138	Require Stormwater Treatment Device Access and Maintenance Agreement				
139	Implement Post-Construction BMP Maintenance Oversight Protocols				
140	**LD5 - Training**				
141	Conduct training				
142	**Section 8 - Monitoring and Reporting Program**				
143	**Water Quality Monitoring (waterbody varies annually)**				
144	Water quality parameters as needed				
145	Sediment toxicity and sediment chemistry as needed				
146	Water column toxicity as needed				
147	**Delta Regional Monitoring Program**				
148	**Section 9 - Program Implementation, Evaluation, and Reporting**				
149	**Program Implementation**				
150	Update Work Plan as needed				
151	**Annual Report**				

APPENDIX B

2022-2023 Monitoring Results

City of Stockton and County of San Joaquin
Ambient Monitoring Program 2022-2023 Data

Event	Site Code	Date Sampled	Analyte	Analytical Method	Q	Result	MDL	RL/ML	Units	Lab Name	Prep Date	Analysis Date
DW52	MS-13	8/31/2022	E. Coli	SM 9223 B-04	=	860	10	10	MPN/100mL	Caltest	8/31/22	9/1/22
SE81	MS-13	11/8/2022	E. Coli	SM 9223 B-04	=	4352	1	1	MPN/100mL	Caltest	11/8/22	11/9/22
DW53	MS-13	11/29/2022	E. Coli	SM 9223 B-04	=	10	10	10	MPN/100mL	Caltest	11/29/22	11/30/22
SE82	MS-13	12/1/2022	E. Coli	SM 9223 B-04	=	4611	10	10	MPN/100mL	Caltest	12/1/22	12/2/22
DW54	MS-13	4/26/2023	E. Coli	SM 9223 B-04	=	10	10	10	MPN/100mL	Caltest	4/26/23	4/27/23
DW55	MS-13	6/8/2023	E. Coli	SM 9223 B-04	=	86	10	10	MPN/100mL	Caltest	6/8/23	6/9/23
DW52	MS-14	8/31/2022	E. Coli	SM 9223 B-04	=	1014	10	10	MPN/100mL	Caltest	8/31/22	9/1/22
SE81	MS-14	11/8/2022	E. Coli	SM 9223 B-04	=	2909	1	1	MPN/100mL	Caltest	11/8/22	11/9/22
DW53	MS-14	11/29/2022	E. Coli	SM 9223 B-04	<	ND	10	10	MPN/100mL	Caltest	11/29/22	11/30/22
SE82	MS-14	12/1/2022	E. Coli	SM 9223 B-04	=	1223	10	10	MPN/100mL	Caltest	12/1/22	12/2/22
DW54	MS-14	4/26/2023	E. Coli	SM 9223 B-04	<	ND	10	10	MPN/100mL	Caltest	4/26/23	4/27/23
DW55	MS-14	6/8/2023	E. Coli	SM 9223 B-04	=	31	10	10	MPN/100mL	Caltest	6/8/23	6/9/23
DW52	MS-14R	8/31/2022	E. Coli	SM 9223 B-04	=	161	10	10	MPN/100mL	Caltest	8/31/22	9/1/22
SE81	MS-14R	11/8/2022	E. Coli	SM 9223 B-04	=	794	1	1	MPN/100mL	Caltest	11/8/22	11/9/22
DW53	MS-14R	11/29/2022	E. Coli	SM 9223 B-04	=	135	10	10	MPN/100mL	Caltest	11/29/22	11/30/22
SE82	MS-14R	12/1/2022	E. Coli	SM 9223 B-04	=	2187	10	10	MPN/100mL	Caltest	12/1/22	12/2/22
DW54	MS-14R	4/26/2023	E. Coli	SM 9223 B-04	=	98	10	10	MPN/100mL	Caltest	4/26/23	4/27/23
DW55	MS-14R	6/8/2023	E. Coli	SM 9223 B-04	=	187	10	10	MPN/100mL	Caltest	6/8/23	6/9/23
DW52	MS-14RUS	8/31/2022	E. Coli	SM 9223 B-04	=	402	10	10	MPN/100mL	Caltest	8/31/22	9/1/22
DW55	MS-14RUS	6/8/2023	E. Coli	SM 9223 B-04	=	74	10	10	MPN/100mL	Caltest	6/8/23	6/9/23
DW52	MS-2D	8/31/2022	E. Coli	SM 9223 B-04	=	173	10	10	MPN/100mL	Caltest	8/31/22	9/1/22
SE81	MS-2D	11/8/2022	E. Coli	SM 9223 B-04	=	6867	10	10	MPN/100mL	Caltest	11/8/22	11/9/22
DW53	MS-2D	11/29/2022	E. Coli	SM 9223 B-04	=	40	10	10	MPN/100mL	Caltest	11/29/22	11/30/22
SE82	MS-2D	12/1/2022	E. Coli	SM 9223 B-04	=	2909	10	10	MPN/100mL	Caltest	12/1/22	12/2/22
DW54	MS-2D	4/26/2023	E. Coli	SM 9223 B-04	=	135	10	10	MPN/100mL	Caltest	4/26/23	4/27/23
DW55	MS-2D	6/8/2023	E. Coli	SM 9223 B-04	=	132	10	10	MPN/100mL	Caltest	6/8/23	6/9/23
DW52	MS-4D	8/31/2022	E. Coli	SM 9223 B-04	<	ND	10	10	MPN/100mL	Caltest	8/31/22	9/1/22
SE81	MS-4D	11/8/2022	E. Coli	SM 9223 B-04	=	14136	10	10	MPN/100mL	Caltest	11/8/22	11/9/22
DW53	MS-4D	11/29/2022	E. Coli	SM 9223 B-04	=	52	10	10	MPN/100mL	Caltest	11/29/22	11/30/22
SE82	MS-4D	12/1/2022	E. Coli	SM 9223 B-04	=	1565	10	10	MPN/100mL	Caltest	12/1/22	12/2/22
DW54	MS-4D	4/26/2023	E. Coli	SM 9223 B-04	=	134	10	10	MPN/100mL	Caltest	4/26/23	4/27/23
DW55	MS-4D	6/8/2023	E. Coli	SM 9223 B-04	=	882	10	10	MPN/100mL	Caltest	6/8/23	6/9/23
DW52	MS-13	8/31/2022	Fecal Coliform	SM 9221 B/E-06	=	130	1.8	1.8	MPN/100mL	Caltest	8/31/22	9/2/22

City of Stockton and County of San Joaquin
Ambient Monitoring Program 2022-2023 Data

Event	Site Code	Date Sampled	Analyte	Analytical Method	Q	Result	MDL	RL/ML	Units	Lab Name	Prep Date	Analysis Date
SE81	MS-13	11/8/2022	Fecal Coliform	SM 9221 B/E-06	=	6300	1.8	1.8	MPN/100mL	Caltest	11/8/22	11/11/22
DW53	MS-13	11/29/2022	Fecal Coliform	SM 9221 B/E-06	=	700	1.8	1.8	MPN/100mL	Caltest	11/29/22	12/2/22
SE82	MS-13	12/1/2022	Fecal Coliform	SM 9221 B/E-06	=	5400	1.8	1.8	MPN/100mL	Caltest	12/1/22	12/3/22
DW54	MS-13	4/26/2023	Fecal Coliform	SM 9221 B/E-06	=	23	1.8	1.8	MPN/100mL	Caltest	4/26/23	4/29/23
DW55	MS-13	6/8/2023	Fecal Coliform	SM 9221 B/E-06	=	170	1.8	1.8	MPN/100mL	Caltest	6/8/23	6/11/23
DW52	MS-14	8/31/2022	Fecal Coliform	SM 9221 B/E-06	>	160000	1.8	1.8	MPN/100mL	Caltest	8/31/22	9/2/22
SE81	MS-14	11/8/2022	Fecal Coliform	SM 9221 B/E-06	=	2400	1.8	1.8	MPN/100mL	Caltest	11/8/22	11/11/22
DW53	MS-14	11/29/2022	Fecal Coliform	SM 9221 B/E-06	=	1700	1.8	1.8	MPN/100mL	Caltest	11/29/22	12/2/22
SE82	MS-14	12/1/2022	Fecal Coliform	SM 9221 B/E-06	=	1700	1.8	1.8	MPN/100mL	Caltest	12/1/22	12/4/22
DW54	MS-14	4/26/2023	Fecal Coliform	SM 9221 B/E-06	=	23	1.8	1.8	MPN/100mL	Caltest	4/26/23	4/29/23
DW55	MS-14	6/8/2023	Fecal Coliform	SM 9221 B/E-06	=	26	1.8	1.8	MPN/100mL	Caltest	6/8/23	6/11/23
DW52	MS-14R	8/31/2022	Fecal Coliform	SM 9221 B/E-06	=	9400	1.8	1.8	MPN/100mL	Caltest	8/31/22	9/3/22
SE81	MS-14R	11/8/2022	Fecal Coliform	SM 9221 B/E-06	=	92000	1.8	1.8	MPN/100mL	Caltest	11/8/22	11/11/22
DW53	MS-14R	11/29/2022	Fecal Coliform	SM 9221 B/E-06	=	110	1.8	1.8	MPN/100mL	Caltest	11/29/22	12/2/22
SE82	MS-14R	12/1/2022	Fecal Coliform	SM 9221 B/E-06	=	3500	1.8	1.8	MPN/100mL	Caltest	12/1/22	12/4/22
DW54	MS-14R	4/26/2023	Fecal Coliform	SM 9221 B/E-06	=	79	1.8	1.8	MPN/100mL	Caltest	4/26/23	4/28/23
DW55	MS-14R	6/8/2023	Fecal Coliform	SM 9221 B/E-06	=	350	1.8	1.8	MPN/100mL	Caltest	6/8/23	6/11/23
DW52	MS-14RUS	8/31/2022	Fecal Coliform	SM 9221 B/E-06	=	5400	1.8	1.8	MPN/100mL	Caltest	8/31/22	9/3/22
DW55	MS-14RUS	6/8/2023	Fecal Coliform	SM 9221 B/E-06	=	460	1.8	1.8	MPN/100mL	Caltest	6/8/23	6/11/23
DW52	MS-2D	8/31/2022	Fecal Coliform	SM 9221 B/E-06	=	17000	1.8	1.8	MPN/100mL	Caltest	8/31/22	9/2/22
SE81	MS-2D	11/8/2022	Fecal Coliform	SM 9221 B/E-06	=	54000	1.8	1.8	MPN/100mL	Caltest	11/8/22	11/11/22
DW53	MS-2D	11/29/2022	Fecal Coliform	SM 9221 B/E-06	=	460	1.8	1.8	MPN/100mL	Caltest	11/29/22	12/1/22
SE82	MS-2D	12/1/2022	Fecal Coliform	SM 9221 B/E-06	=	7000	1.8	1.8	MPN/100mL	Caltest	12/1/22	12/3/22
DW54	MS-2D	4/26/2023	Fecal Coliform	SM 9221 B/E-06	=	1600	1.8	1.8	MPN/100mL	Caltest	4/26/23	4/29/23
DW55	MS-2D	6/8/2023	Fecal Coliform	SM 9221 B/E-06	=	3500	1.8	1.8	MPN/100mL	Caltest	6/8/23	6/10/23
DW52	MS-4D	8/31/2022	Fecal Coliform	SM 9221 B/E-06	=	630	1.8	1.8	MPN/100mL	Caltest	8/31/22	9/2/22
SE81	MS-4D	11/8/2022	Fecal Coliform	SM 9221 B/E-06	=	92000	1.8	1.8	MPN/100mL	Caltest	11/8/22	11/11/22
DW53	MS-4D	11/29/2022	Fecal Coliform	SM 9221 B/E-06	=	460	1.8	1.8	MPN/100mL	Caltest	11/29/22	12/2/22
SE82	MS-4D	12/1/2022	Fecal Coliform	SM 9221 B/E-06	=	5400	1.8	1.8	MPN/100mL	Caltest	12/1/22	12/4/22
DW54	MS-4D	4/26/2023	Fecal Coliform	SM 9221 B/E-06	=	170	1.8	1.8	MPN/100mL	Caltest	4/26/23	4/29/23
DW55	MS-4D	6/8/2023	Fecal Coliform	SM 9221 B/E-06	=	130	1.8	1.8	MPN/100mL	Caltest	6/8/23	6/11/23
DW52	MS-13	8/31/2022	Dissolved Oxygen	Field	=	4.5			mg/L	Field Log		
SE81	MS-13	11/8/2022	Dissolved Oxygen	Field	=	8.6			mg/L	Field Log		

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Event	Site Code	Date Sampled	Analyte	Analytical Method	Q	Result	MDL	RL/ML	Units	Lab Name	Prep Date	Analysis Date
DW53	MS-13	11/29/2022	Dissolved Oxygen	Field	=	4.75			mg/L	Field Log		
SE82	MS-13	12/1/2022	Dissolved Oxygen	Field	=	8.9			mg/L	Field Log		
DW54	MS-13	4/26/2023	Dissolved Oxygen	Field	=	6			mg/L	Field Log		
DW55	MS-13	6/8/2023	Dissolved Oxygen	Field	=	6			mg/L	Field Log		
DW52	MS-14	8/31/2022	Dissolved Oxygen	Field	=	3.6			mg/L	Field Log		
SE81	MS-14	11/8/2022	Dissolved Oxygen	Field	=	4.2			mg/L	Field Log		
DW53	MS-14	11/29/2022	Dissolved Oxygen	Field	=	3.35			mg/L	Field Log		
SE82	MS-14	12/1/2022	Dissolved Oxygen	Field	=	9.2			mg/L	Field Log		
DW54	MS-14	4/26/2023	Dissolved Oxygen	Field	=	4.7			mg/L	Field Log		
DW55	MS-14	6/8/2023	Dissolved Oxygen	Field	=	6.9			mg/L	Field Log		
DW52	MS-14R	8/31/2022	Dissolved Oxygen	Field	=	7.2			mg/L	Field Log		
SE81	MS-14R	11/8/2022	Dissolved Oxygen	Field	=	8.7			mg/L	Field Log		
DW53	MS-14R	11/29/2022	Dissolved Oxygen	Field	=	9.75			mg/L	Field Log		
SE82	MS-14R	12/1/2022	Dissolved Oxygen	Field	=	9.1			mg/L	Field Log		
DW54	MS-14R	4/26/2023	Dissolved Oxygen	Field	=	5.6			mg/L	Field Log		
DW55	MS-14R	6/8/2023	Dissolved Oxygen	Field	=	6.1			mg/L	Field Log		
DW52	MS-14RUS	8/31/2022	Dissolved Oxygen	Field	=	8.36			mg/L	Field Log		
SE81	MS-14RUS	11/8/2022	Dissolved Oxygen	Field	Site was dry				mg/L	Field Log		
DW53	MS-14RUS	11/29/2022	Dissolved Oxygen	Field	Site was dry				mg/L	Field Log		
SE82	MS-14RUS	12/1/2022	Dissolved Oxygen	Field	Site was dry				mg/L	Field Log		
DW54	MS-14RUS	4/26/2023	Dissolved Oxygen	Field	Site was dry				mg/L	Field Log		
DW55	MS-14RUS	6/8/2023	Dissolved Oxygen	Field	=	8.5			mg/L	Field Log		
DW52	MS-2D	8/31/2022	Dissolved Oxygen	Field	=	7.2			mg/L	Field Log		
SE81	MS-2D	11/8/2022	Dissolved Oxygen	Field	=	8			mg/L	Field Log		
DW53	MS-2D	11/29/2022	Dissolved Oxygen	Field	=	7.4			mg/L	Field Log		
SE82	MS-2D	12/1/2022	Dissolved Oxygen	Field	=	9.8			mg/L	Field Log		
DW54	MS-2D	4/26/2023	Dissolved Oxygen	Field	=	7			mg/L	Field Log		
DW55	MS-2D	6/8/2023	Dissolved Oxygen	Field	=	10.5			mg/L	Field Log		
DW52	MS-4D	8/31/2022	Dissolved Oxygen	Field	=	2.54			mg/L	Field Log		
SE81	MS-4D	11/8/2022	Dissolved Oxygen	Field	=	8.6			mg/L	Field Log		
DW53	MS-4D	11/29/2022	Dissolved Oxygen	Field	=	1.47			mg/L	Field Log		
SE82	MS-4D	12/1/2022	Dissolved Oxygen	Field	=	8.9			mg/L	Field Log		
DW54	MS-4D	4/26/2023	Dissolved Oxygen	Field	=	6.3			mg/L	Field Log		

Event	Site Code	Date Sampled	Analyte	Analytical Method	Q	Result	MDL	RL/ML	Units	Lab Name	Prep Date	Analysis Date
DW55	MS-4D	6/8/2023	Dissolved Oxygen	Field	=	5.6			mg/L	Field Log		
SE81	NE-RAIN	11/8/2022	Dissolved Oxygen	Field	=	11.7			mg/L	Field Log		
SE82	NE-RAIN	12/1/2022	Dissolved Oxygen	Field	=	10.5			mg/L	Field Log		
SE81	SC-RAIN	11/8/2022	Dissolved Oxygen	Field	=	9.6			mg/L	Field Log		
SE82	SC-RAIN	12/1/2022	Dissolved Oxygen	Field	=	10.7			mg/L	Field Log		
DW52	MS-13	8/31/2022	pH	Field	=	7.26			SU	Field Log		
SE81	MS-13	11/8/2022	pH	Field	=	6.83			SU	Field Log		
DW53	MS-13	11/29/2022	pH	Field	=	7.08			SU	Field Log		
SE82	MS-13	12/1/2022	pH	Field	=	7.33			SU	Field Log		
DW54	MS-13	4/26/2023	pH	Field	=	7.4			SU	Field Log		
DW55	MS-13	6/8/2023	pH	Field	=	7.04			SU	Field Log		
DW52	MS-14	8/31/2022	pH	Field	=	7.07			SU	Field Log		
SE81	MS-14	11/8/2022	pH	Field	=	6.69			SU	Field Log		
DW53	MS-14	11/29/2022	pH	Field	=	7.33			SU	Field Log		
SE82	MS-14	12/1/2022	pH	Field	=	7.04			SU	Field Log		
DW54	MS-14	4/26/2023	pH	Field	=	7.45			SU	Field Log		
DW55	MS-14	6/8/2023	pH	Field	=	7.27			SU	Field Log		
DW52	MS-14R	8/31/2022	pH	Field	=	7.17			SU	Field Log		
SE81	MS-14R	11/8/2022	pH	Field	=	7.23			SU	Field Log		
DW53	MS-14R	11/29/2022	pH	Field	=	7.82			SU	Field Log		
SE82	MS-14R	12/1/2022	pH	Field	=	7.8			SU	Field Log		
DW54	MS-14R	4/26/2023	pH	Field	=	7.65			SU	Field Log		
DW55	MS-14R	6/8/2023	pH	Field	=	7.62			SU	Field Log		
DW52	MS-14RUS	8/31/2022	pH	Field	=	7.66			SU	Field Log		
SE81	MS-14RUS	11/8/2022	pH	Field	Site was dry				SU	Field Log		
DW53	MS-14RUS	11/29/2022	pH	Field	Site was dry				SU	Field Log		
SE82	MS-14RUS	12/1/2022	pH	Field	Site was dry				SU	Field Log		
DW54	MS-14RUS	4/26/2023	pH	Field	Site was dry				SU	Field Log		
DW55	MS-14RUS	6/8/2023	pH	Field	=	8.09			SU	Field Log		
DW52	MS-2D	8/31/2022	pH	Field	=	7.62			SU	Field Log		
SE81	MS-2D	11/8/2022	pH	Field	=	6.43			SU	Field Log		
DW53	MS-2D	11/29/2022	pH	Field	=	7.51			SU	Field Log		
SE82	MS-2D	12/1/2022	pH	Field	=	7.17			SU	Field Log		

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Event	Site Code	Date Sampled	Analyte	Analytical Method	Q	Result	MDL	RL/ML	Units	Lab Name	Prep Date	Analysis Date
DW54	MS-2D	4/26/2023	pH	Field	=	7.75			SU	Field Log		
DW55	MS-2D	6/8/2023	pH	Field	=	7.58			SU	Field Log		
DW52	MS-4D	8/31/2022	pH	Field	=	6.95			SU	Field Log		
SE81	MS-4D	11/8/2022	pH	Field	=	6.75			SU	Field Log		
DW53	MS-4D	11/29/2022	pH	Field	=	7.02			SU	Field Log		
SE82	MS-4D	12/1/2022	pH	Field	=	7.01			SU	Field Log		
DW54	MS-4D	4/26/2023	pH	Field	=	7.76			SU	Field Log		
DW55	MS-4D	6/8/2023	pH	Field	=	7.54			SU	Field Log		
SE81	NE-RAIN	11/8/2022	pH	Field	=	8.86			SU	Field Log		
SE82	NE-RAIN	12/1/2022	pH	Field	=	6.98			SU	Field Log		
SE81	SC-RAIN	11/8/2022	pH	Field	=	8.64			SU	Field Log		
SE82	SC-RAIN	12/1/2022	pH	Field	=	7.26			SU	Field Log		
DW52	MS-13	8/31/2022	Specific Conductance	Field	=	623			umhos/cm	Field Log		
SE81	MS-13	11/8/2022	Specific Conductance	Field	=	293			umhos/cm	Field Log		
DW53	MS-13	11/29/2022	Specific Conductance	Field	=	794			umhos/cm	Field Log		
SE82	MS-13	12/1/2022	Specific Conductance	Field	=	133			umhos/cm	Field Log		
DW54	MS-13	4/26/2023	Specific Conductance	Field	=	715			umhos/cm	Field Log		
DW55	MS-13	6/8/2023	Specific Conductance	Field	=	377			umhos/cm	Field Log		
DW52	MS-14	8/31/2022	Specific Conductance	Field	=	438.2			umhos/cm	Field Log		
SE81	MS-14	11/8/2022	Specific Conductance	Field	=	159			umhos/cm	Field Log		
DW53	MS-14	11/29/2022	Specific Conductance	Field	=	543			umhos/cm	Field Log		
SE82	MS-14	12/1/2022	Specific Conductance	Field	=	68			umhos/cm	Field Log		
DW54	MS-14	4/26/2023	Specific Conductance	Field	=	705			umhos/cm	Field Log		
DW55	MS-14	6/8/2023	Specific Conductance	Field	=	705			umhos/cm	Field Log		
DW52	MS-14R	8/31/2022	Specific Conductance	Field	=	126			umhos/cm	Field Log		
SE81	MS-14R	11/8/2022	Specific Conductance	Field	=	128			umhos/cm	Field Log		
DW53	MS-14R	11/29/2022	Specific Conductance	Field	=	477			umhos/cm	Field Log		
SE82	MS-14R	12/1/2022	Specific Conductance	Field	=	208			umhos/cm	Field Log		
DW54	MS-14R	4/26/2023	Specific Conductance	Field	=	165			umhos/cm	Field Log		
DW55	MS-14R	6/8/2023	Specific Conductance	Field	=	132			umhos/cm	Field Log		
DW52	MS-14RUS	8/31/2022	Specific Conductance	Field	=	207			umhos/cm	Field Log		
SE81	MS-14RUS	11/8/2022	Specific Conductance	Field	Site was dry				umhos/cm	Field Log		
DW53	MS-14RUS	11/29/2022	Specific Conductance	Field	Site was dry				umhos/cm	Field Log		

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Event	Site Code	Date Sampled	Analyte	Analytical Method	Q	Result	MDL	RL/ML	Units	Lab Name	Prep Date	Analysis Date
SE82	MS-14RUS	12/1/2022	Specific Conductance	Field	Site was dry				umhos/cm	Field Log		
DW54	MS-14RUS	4/26/2023	Specific Conductance	Field	Site was dry				umhos/cm	Field Log		
DW55	MS-14RUS	6/8/2023	Specific Conductance	Field	=	150			umhos/cm	Field Log		
DW52	MS-2D	8/31/2022	Specific Conductance	Field	=	292			umhos/cm	Field Log		
SE81	MS-2D	11/8/2022	Specific Conductance	Field	=	51			umhos/cm	Field Log		
DW53	MS-2D	11/29/2022	Specific Conductance	Field	=	532			umhos/cm	Field Log		
SE82	MS-2D	12/1/2022	Specific Conductance	Field	=	59			umhos/cm	Field Log		
DW54	MS-2D	4/26/2023	Specific Conductance	Field	=	418			umhos/cm	Field Log		
DW55	MS-2D	6/8/2023	Specific Conductance	Field	=	309			umhos/cm	Field Log		
DW52	MS-4D	8/31/2022	Specific Conductance	Field	=	213.5			umhos/cm	Field Log		
SE81	MS-4D	11/8/2022	Specific Conductance	Field	=	17			umhos/cm	Field Log		
DW53	MS-4D	11/29/2022	Specific Conductance	Field	=	314			umhos/cm	Field Log		
SE82	MS-4D	12/1/2022	Specific Conductance	Field	=	67			umhos/cm	Field Log		
DW54	MS-4D	4/26/2023	Specific Conductance	Field	=	671			umhos/cm	Field Log		
DW55	MS-4D	6/8/2023	Specific Conductance	Field	=	222			umhos/cm	Field Log		
SE81	NE-RAIN	11/8/2022	Specific Conductance	Field	=	13.9			umhos/cm	Field Log		
SE82	NE-RAIN	12/1/2022	Specific Conductance	Field	=	9			umhos/cm	Field Log		
SE81	SC-RAIN	11/8/2022	Specific Conductance	Field	=	8.1			umhos/cm	Field Log		
SE82	SC-RAIN	12/1/2022	Specific Conductance	Field	=	11.3			umhos/cm	Field Log		
DW52	MS-13	8/31/2022	Temperature	Field	=	21.9			degrees C	Field Log		
SE81	MS-13	11/8/2022	Temperature	Field	=	15.8			degrees C	Field Log		
DW53	MS-13	11/29/2022	Temperature	Field	=	19.8			degrees C	Field Log		
SE82	MS-13	12/1/2022	Temperature	Field	=	11.8			degrees C	Field Log		
DW54	MS-13	4/26/2023	Temperature	Field	=	19.8			degrees C	Field Log		
DW55	MS-13	6/8/2023	Temperature	Field	=	20.1			degrees C	Field Log		
DW52	MS-14	8/31/2022	Temperature	Field	=	21.1			degrees C	Field Log		
SE81	MS-14	11/8/2022	Temperature	Field	=	15.2			degrees C	Field Log		
DW53	MS-14	11/29/2022	Temperature	Field	=	19.4			degrees C	Field Log		
SE82	MS-14	12/1/2022	Temperature	Field	=	11.6			degrees C	Field Log		
DW54	MS-14	4/26/2023	Temperature	Field	=	19.8			degrees C	Field Log		
DW55	MS-14	6/8/2023	Temperature	Field	=	19.9			degrees C	Field Log		
DW52	MS-14R	8/31/2022	Temperature	Field	=	22.6			degrees C	Field Log		
SE81	MS-14R	11/8/2022	Temperature	Field	=	13			degrees C	Field Log		

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Event	Site Code	Date Sampled	Analyte	Analytical Method	Q	Result	MDL	RL/ML	Units	Lab Name	Prep Date	Analysis Date
DW53	MS-14R	11/29/2022	Temperature	Field	=	11.2			degrees C	Field Log		
SE82	MS-14R	12/1/2022	Temperature	Field	=	10.9			degrees C	Field Log		
DW54	MS-14R	4/26/2023	Temperature	Field	=	19.7			degrees C	Field Log		
DW55	MS-14R	6/8/2023	Temperature	Field	=	21.5			degrees C	Field Log		
DW52	MS-14RUS	8/31/2022	Temperature	Field	=	21.4			degrees C	Field Log		
SE81	MS-14RUS	11/8/2022	Temperature	Field	Site was dry				degrees C	Field Log		
DW53	MS-14RUS	11/29/2022	Temperature	Field	Site was dry				degrees C	Field Log		
SE82	MS-14RUS	12/1/2022	Temperature	Field	Site was dry				degrees C	Field Log		
DW54	MS-14RUS	4/26/2023	Temperature	Field	Site was dry				degrees C	Field Log		
DW55	MS-14RUS	6/8/2023	Temperature	Field	=	18.4			degrees C	Field Log		
DW52	MS-2D	8/31/2022	Temperature	Field	=	21.5			degrees C	Field Log		
SE81	MS-2D	11/8/2022	Temperature	Field	=	13.4			degrees C	Field Log		
DW53	MS-2D	11/29/2022	Temperature	Field	=	16.4			degrees C	Field Log		
SE82	MS-2D	12/1/2022	Temperature	Field	=	11.8			degrees C	Field Log		
DW54	MS-2D	4/26/2023	Temperature	Field	=	16.8			degrees C	Field Log		
DW55	MS-2D	6/8/2023	Temperature	Field	=	18.1			degrees C	Field Log		
DW52	MS-4D	8/31/2022	Temperature	Field	=	21.7			degrees C	Field Log		
SE81	MS-4D	11/8/2022	Temperature	Field	=	13.7			degrees C	Field Log		
DW53	MS-4D	11/29/2022	Temperature	Field	=	14.7			degrees C	Field Log		
SE82	MS-4D	12/1/2022	Temperature	Field	=	11.9			degrees C	Field Log		
DW54	MS-4D	4/26/2023	Temperature	Field	=	15.6			degrees C	Field Log		
DW55	MS-4D	6/8/2023	Temperature	Field	=	17.7			degrees C	Field Log		
SE81	NE-RAIN	11/8/2022	Temperature	Field	=	10.8			degrees C	Field Log		
SE82	NE-RAIN	12/1/2022	Temperature	Field	=	7.9			degrees C	Field Log		
SE81	SC-RAIN	11/8/2022	Temperature	Field	=	11.6			degrees C	Field Log		
SE82	SC-RAIN	12/1/2022	Temperature	Field	=	10.3			degrees C	Field Log		
DW52	MS-13	8/31/2022	Mercury	EPA 1631E	=	0.0024	2E-04	0.0005	ug/L	Caltest	9/8/22	9/9/22
SE81	MS-13	11/8/2022	Mercury	EPA 1631E	=	0.0036	2E-04	0.0005	ug/L	Caltest	11/16/22	11/17/22
DW53	MS-13	11/29/2022	Mercury	EPA 1631E	=	0.0017	2E-04	0.0005	ug/L	Caltest	12/1/22	12/2/22
SE82	MS-13	12/1/2022	Mercury	EPA 1631E	=	0.0031	2E-04	0.0005	ug/L	Caltest	12/6/22	12/7/22
DW54	MS-13	4/26/2023	Mercury	EPA 1631E	=	0.002	2E-04	0.0005	ug/L	Caltest	5/10/23	5/11/23
DW55	MS-13	6/8/2023	Mercury	EPA 1631E	=	0.00097	2E-04	0.0005	ug/L	Caltest	6/27/23	6/29/23
DW52	MS-14	8/31/2022	Mercury	EPA 1631E	=	0.0015	2E-04	0.0005	ug/L	Caltest	9/8/22	9/9/22

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Event	Site Code	Date Sampled	Analyte	Analytical Method	Q	Result	MDL	RL/ML	Units	Lab Name	Prep Date	Analysis Date
SE81	MS-14	11/8/2022	Mercury	EPA 1631E	=	0.003	2E-04	0.0005	ug/L	Caltest	11/16/22	11/17/22
DW53	MS-14	11/29/2022	Mercury	EPA 1631E	=	0.0015	2E-04	0.0005	ug/L	Caltest	12/1/22	12/2/22
SE82	MS-14	12/1/2022	Mercury	EPA 1631E	=	0.0022	2E-04	0.0005	ug/L	Caltest	12/6/22	12/7/22
DW54	MS-14	4/26/2023	Mercury	EPA 1631E	=	0.0022	2E-04	0.0005	ug/L	Caltest	5/10/23	5/11/23
DW55	MS-14	6/8/2023	Mercury	EPA 1631E	=	0.0018	2E-04	0.0005	ug/L	Caltest	6/27/23	6/29/23
DW52	MS-14R	8/31/2022	Mercury	EPA 1631E	=	0.0014	2E-04	0.0005	ug/L	Caltest	9/8/22	9/9/22
SE81	MS-14R	11/8/2022	Mercury	EPA 1631E	=	0.0041	2E-04	0.0005	ug/L	Caltest	11/16/22	11/17/22
DW53	MS-14R	11/29/2022	Mercury	EPA 1631E	=	0.0008	2E-04	0.0005	ug/L	Caltest	12/1/22	12/2/22
SE82	MS-14R	12/1/2022	Mercury	EPA 1631E	=	0.0017	2E-04	0.0005	ug/L	Caltest	12/6/22	12/7/22
DW54	MS-14R	4/26/2023	Mercury	EPA 1631E	=	0.0031	2E-04	0.0005	ug/L	Caltest	5/10/23	5/11/23
DW55	MS-14R	6/8/2023	Mercury	EPA 1631E	=	0.0032	2E-04	0.0005	ug/L	Caltest	6/27/23	6/29/23
DW52	MS-14RUS	8/31/2022	Mercury	EPA 1631E	=	0.0024	2E-04	0.0005	ug/L	Caltest	9/8/22	9/9/22
DW55	MS-14RUS	6/8/2023	Mercury	EPA 1631E	=	0.0024	2E-04	0.0005	ug/L	Caltest	6/27/23	6/29/23
DW52	MS-2D	8/31/2022	Mercury	EPA 1631E	=	0.0016	2E-04	0.0005	ug/L	Caltest	9/8/22	9/9/22
SE81	MS-2D	11/8/2022	Mercury	EPA 1631E	=	0.0051	2E-04	0.0005	ug/L	Caltest	11/16/22	11/17/22
DW53	MS-2D	11/29/2022	Mercury	EPA 1631E	=	0.0014	2E-04	0.0005	ug/L	Caltest	12/1/22	12/2/22
SE82	MS-2D	12/1/2022	Mercury	EPA 1631E	=	0.0038	2E-04	0.0005	ug/L	Caltest	12/6/22	12/7/22
DW54	MS-2D	4/26/2023	Mercury	EPA 1631E	=	0.0052	2E-04	0.0005	ug/L	Caltest	5/10/23	5/11/23
DW55	MS-2D	6/8/2023	Mercury	EPA 1631E	=	0.00073	2E-04	0.0005	ug/L	Caltest	6/27/23	6/29/23
DW52	MS-4D	8/31/2022	Mercury	EPA 1631E	=	0.001	2E-04	0.0005	ug/L	Caltest	9/8/22	9/9/22
SE81	MS-4D	11/8/2022	Mercury	EPA 1631E	=	0.0042	2E-04	0.0005	ug/L	Caltest	11/16/22	11/17/22
DW53	MS-4D	11/29/2022	Mercury	EPA 1631E	=	0.0018	2E-04	0.0005	ug/L	Caltest	12/1/22	12/2/22
SE82	MS-4D	12/1/2022	Mercury	EPA 1631E	=	0.0046	2E-04	0.0005	ug/L	Caltest	12/6/22	12/7/22
DW54	MS-4D	4/26/2023	Mercury	EPA 1631E	=	0.0023	2E-04	0.0005	ug/L	Caltest	5/10/23	5/11/23
DW55	MS-4D	6/8/2023	Mercury	EPA 1631E	=	0.0011	2E-04	0.0005	ug/L	Caltest	6/27/23	6/29/23
SE81	NE-RAIN	11/8/2022	Mercury	EPA 1631E	=	0.0017	2E-04	0.0005	ug/L	Caltest	11/16/22	11/17/22
SE82	NE-RAIN	12/1/2022	Mercury	EPA 1631E	=	0.0016	2E-04	0.0005	ug/L	Caltest	12/6/22	12/7/22
SE81	SC-RAIN	11/8/2022	Mercury	EPA 1631E	=	0.0016	2E-04	0.0005	ug/L	Caltest	11/16/22	11/17/22
SE82	SC-RAIN	12/1/2022	Mercury	EPA 1631E	=	0.0019	2E-04	0.0005	ug/L	Caltest	12/6/22	12/7/22
DW52	MS-13	8/31/2022	Methyl Mercury	EPA 1630	<	ND	0.02	0.05	ng/L	Caltest	9/12/22	9/13/22
SE81	MS-13	11/8/2022	Methyl Mercury	EPA 1630	J	0.043	0.02	0.05	ng/L	Caltest	11/22/22	11/25/22
DW53	MS-13	11/29/2022	Methyl Mercury	EPA 1630	J	0.031	0.02	0.05	ng/L	Caltest	12/8/22	12/9/22
SE82	MS-13	12/1/2022	Methyl Mercury	EPA 1630	=	0.63	0.02	0.05	ng/L	Caltest	12/28/22	12/29/22

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Event	Site Code	Date Sampled	Analyte	Analytical Method	Q	Result	MDL	RL/ML	Units	Lab Name	Prep Date	Analysis Date
DW54	MS-13	4/26/2023	Methyl Mercury	EPA 1630	<	ND	0.02	0.05	ng/L	Caltest	5/15/23	5/17/23
DW55	MS-13	6/8/2023	Methyl Mercury	EPA 1630	J	0.042	0.02	0.05	ng/L	Caltest	6/14/23	6/15/23
DW52	MS-14	8/31/2022	Methyl Mercury	EPA 1630	<	ND	0.02	0.05	ng/L	Caltest	9/12/22	9/13/22
SE81	MS-14	11/8/2022	Methyl Mercury	EPA 1630	=	0.07	0.02	0.05	ng/L	Caltest	11/22/22	11/25/22
DW53	MS-14	11/29/2022	Methyl Mercury	EPA 1630	<	ND	0.02	0.05	ng/L	Caltest	12/8/22	12/9/22
SE82	MS-14	12/1/2022	Methyl Mercury	EPA 1630	=	0.13	0.02	0.05	ng/L	Caltest	12/28/22	12/29/22
DW54	MS-14	4/26/2023	Methyl Mercury	EPA 1630	<	ND	0.02	0.05	ng/L	Caltest	5/15/23	5/17/23
DW55	MS-14	6/8/2023	Methyl Mercury	EPA 1630	<	ND	0.02	0.05	ng/L	Caltest	6/14/23	6/15/23
DW52	MS-14R	8/31/2022	Methyl Mercury	EPA 1630	J	0.023	0.02	0.05	ng/L	Caltest	9/12/22	9/13/22
SE81	MS-14R	11/8/2022	Methyl Mercury	EPA 1630	=	0.11	0.02	0.05	ng/L	Caltest	11/22/22	11/25/22
DW53	MS-14R	11/29/2022	Methyl Mercury	EPA 1630	<	ND	0.02	0.05	ng/L	Caltest	12/8/22	12/9/22
SE82	MS-14R	12/1/2022	Methyl Mercury	EPA 1630	=	0.091	0.02	0.05	ng/L	Caltest	12/28/22	12/29/22
DW54	MS-14R	4/26/2023	Methyl Mercury	EPA 1630	=	0.094	0.02	0.05	ng/L	Caltest	5/15/23	5/17/23
DW55	MS-14R	6/8/2023	Methyl Mercury	EPA 1630	=	0.059	0.02	0.05	ng/L	Caltest	6/14/23	6/15/23
DW52	MS-14RUS	8/31/2022	Methyl Mercury	EPA 1630	=	0.1	0.02	0.05	ng/L	Caltest	9/12/22	9/13/22
DW55	MS-14RUS	6/8/2023	Methyl Mercury	EPA 1630	=	0.18	0.02	0.05	ng/L	Caltest	6/14/23	6/15/23
DW52	MS-2D	8/31/2022	Methyl Mercury	EPA 1630	J	0.031	0.02	0.05	ng/L	Caltest	9/12/22	9/13/22
SE81	MS-2D	11/8/2022	Methyl Mercury	EPA 1630	=	0.089	0.02	0.05	ng/L	Caltest	11/22/22	11/25/22
DW53	MS-2D	11/29/2022	Methyl Mercury	EPA 1630	J	0.025	0.02	0.05	ng/L	Caltest	12/8/22	12/9/22
SE82	MS-2D	12/1/2022	Methyl Mercury	EPA 1630	=	0.15	0.02	0.05	ng/L	Caltest	12/28/22	12/29/22
DW54	MS-2D	4/26/2023	Methyl Mercury	EPA 1630	=	0.28	0.02	0.05	ng/L	Caltest	5/15/23	5/17/23
DW55	MS-2D	6/8/2023	Methyl Mercury	EPA 1630	J	0.044	0.02	0.05	ng/L	Caltest	6/14/23	6/15/23
DW52	MS-4D	8/31/2022	Methyl Mercury	EPA 1630	=	0.063	0.02	0.05	ng/L	Caltest	9/12/22	9/13/22
SE81	MS-4D	11/8/2022	Methyl Mercury	EPA 1630	=	0.1	0.02	0.05	ng/L	Caltest	11/22/22	11/25/22
DW53	MS-4D	11/29/2022	Methyl Mercury	EPA 1630	=	0.31	0.02	0.05	ng/L	Caltest	12/8/22	12/9/22
SE82	MS-4D	12/1/2022	Methyl Mercury	EPA 1630	=	0.27	0.02	0.05	ng/L	Caltest	12/28/22	12/29/22
DW54	MS-4D	4/26/2023	Methyl Mercury	EPA 1630	=	0.094	0.02	0.05	ng/L	Caltest	5/15/23	5/17/23
DW55	MS-4D	6/8/2023	Methyl Mercury	EPA 1630	=	0.14	0.02	0.05	ng/L	Caltest	6/14/23	6/15/23
SE81	NE-RAIN	11/8/2022	Methyl Mercury	EPA 1630	=	0.088	0.02	0.05	ng/L	Caltest	11/22/22	11/25/22
SE82	NE-RAIN	12/1/2022	Methyl Mercury	EPA 1630	=	0.087	0.02	0.05	ng/L	Caltest	12/28/22	12/29/22
SE81	SC-RAIN	11/8/2022	Methyl Mercury	EPA 1630	=	0.068	0.02	0.05	ng/L	Caltest	11/22/22	11/25/22
SE82	SC-RAIN	12/1/2022	Methyl Mercury	EPA 1630	=	0.13	0.02	0.05	ng/L	Caltest	12/28/22	12/29/22
DW52	MS-13	8/31/2022	Aluminum	EPA 200.8	=	80	4	10	ug/L	Caltest	9/2/22	9/6/22

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Event	Site Code	Date Sampled	Analyte	Analytical Method	Q	Result	MDL	RL/ML	Units	Lab Name	Prep Date	Analysis Date
SE81	MS-13	11/8/2022	Aluminum	EPA 200.8	=	257	4	10	ug/L	Caltest	11/14/22	11/23/22
DW53	MS-13	11/29/2022	Aluminum	EPA 200.8	=	61	4	10	ug/L	Caltest	12/2/22	12/6/22
SE82	MS-13	12/1/2022	Aluminum	EPA 200.8	=	3130	40	50	ug/L	Caltest	12/6/22	12/10/22
DW54	MS-13	4/26/2023	Aluminum	EPA 200.8	=	60	4	10	ug/L	Caltest	5/1/23	5/2/23
DW55	MS-13	6/8/2023	Aluminum	EPA 200.8	=	46	4	10	ug/L	Caltest	6/14/23	6/15/23
DW52	MS-14	8/31/2022	Aluminum	EPA 200.8	=	99	4	10	ug/L	Caltest	9/2/22	9/6/22
SE81	MS-14	11/8/2022	Aluminum	EPA 200.8	=	237	4	10	ug/L	Caltest	11/14/22	11/17/22
DW53	MS-14	11/29/2022	Aluminum	EPA 200.8	J	8.1	4	10	ug/L	Caltest	12/2/22	12/5/22
SE82	MS-14	12/1/2022	Aluminum	EPA 200.8	=	276	4	10	ug/L	Caltest	12/6/22	12/9/22
DW54	MS-14	4/26/2023	Aluminum	EPA 200.8	=	58	4	10	ug/L	Caltest	5/1/23	5/2/23
DW55	MS-14	6/8/2023	Aluminum	EPA 200.8	=	18	4	10	ug/L	Caltest	6/14/23	6/15/23
DW52	MS-14R	8/31/2022	Aluminum	EPA 200.8	=	468	4	10	ug/L	Caltest	9/2/22	9/6/22
SE81	MS-14R	11/8/2022	Aluminum	EPA 200.8	=	394	4	10	ug/L	Caltest	11/14/22	11/17/22
DW53	MS-14R	11/29/2022	Aluminum	EPA 200.8	=	140	4	10	ug/L	Caltest	12/2/22	12/5/22
SE82	MS-14R	12/1/2022	Aluminum	EPA 200.8	=	313	4	10	ug/L	Caltest	12/6/22	12/9/22
DW54	MS-14R	4/26/2023	Aluminum	EPA 200.8	=	501	8	10	ug/L	Caltest	5/1/23	5/4/23
DW55	MS-14R	6/8/2023	Aluminum	EPA 200.8	=	675	8	10	ug/L	Caltest	6/14/23	6/17/23
DW52	MS-14RUS	8/31/2022	Aluminum	EPA 200.8	=	475	4	10	ug/L	Caltest	9/2/22	9/6/22
DW55	MS-14RUS	6/8/2023	Aluminum	EPA 200.8	=	463	4	10	ug/L	Caltest	6/14/23	6/15/23
DW52	MS-2D	8/31/2022	Aluminum	EPA 200.8	=	56	4	10	ug/L	Caltest	9/2/22	9/6/22
SE81	MS-2D	11/8/2022	Aluminum	EPA 200.8	=	1140	16	20	ug/L	Caltest	11/14/22	11/22/22
DW53	MS-2D	11/29/2022	Aluminum	EPA 200.8	=	90	4	10	ug/L	Caltest	12/2/22	12/5/22
SE82	MS-2D	12/1/2022	Aluminum	EPA 200.8	=	1160	16	20	ug/L	Caltest	12/6/22	12/10/22
DW54	MS-2D	4/26/2023	Aluminum	EPA 200.8	=	608	8	10	ug/L	Caltest	5/1/23	5/3/23
DW55	MS-2D	6/8/2023	Aluminum	EPA 200.8	=	20	4	10	ug/L	Caltest	6/14/23	6/15/23
DW52	MS-4D	8/31/2022	Aluminum	EPA 200.8	=	40	4	10	ug/L	Caltest	9/2/22	9/6/22
SE81	MS-4D	11/8/2022	Aluminum	EPA 200.8	=	555	8	10	ug/L	Caltest	11/14/22	11/22/22
DW53	MS-4D	11/29/2022	Aluminum	EPA 200.8	=	36	4	10	ug/L	Caltest	12/2/22	12/5/22
SE82	MS-4D	12/1/2022	Aluminum	EPA 200.8	=	1730	16	20	ug/L	Caltest	12/6/22	12/10/22
DW54	MS-4D	4/26/2023	Aluminum	EPA 200.8	=	127	4	10	ug/L	Caltest	5/1/23	5/2/23
DW55	MS-4D	6/8/2023	Aluminum	EPA 200.8	=	34	4	10	ug/L	Caltest	6/14/23	6/15/23
DW52	MS-13	8/31/2022	Iron	EPA 200.8	=	0.093	0.005	0.05	mg/L	Caltest	9/2/22	9/6/22
SE81	MS-13	11/8/2022	Iron	EPA 200.8	=	0.42	0.005	0.05	mg/L	Caltest	11/14/22	11/23/22

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Event	Site Code	Date Sampled	Analyte	Analytical Method	Q	Result	MDL	RL/ML	Units	Lab Name	Prep Date	Analysis Date
DW53	MS-13	11/29/2022	Iron	EPA 200.8	=	0.26	0.005	0.05	mg/L	Caltest	12/2/22	12/6/22
SE82	MS-13	12/1/2022	Iron	EPA 200.8	=	4.8	0.005	0.05	mg/L	Caltest	12/6/22	12/9/22
DW54	MS-13	4/26/2023	Iron	EPA 200.8	=	0.22	0.005	0.05	mg/L	Caltest	5/1/23	5/2/23
DW55	MS-13	6/8/2023	Iron	EPA 200.8	=	0.064	0.005	0.05	mg/L	Caltest	6/14/23	6/15/23
DW52	MS-14	8/31/2022	Iron	EPA 200.8	=	0.18	0.005	0.05	mg/L	Caltest	9/2/22	9/6/22
SE81	MS-14	11/8/2022	Iron	EPA 200.8	=	0.37	0.005	0.05	mg/L	Caltest	11/14/22	11/17/22
DW53	MS-14	11/29/2022	Iron	EPA 200.8	=	0.12	0.005	0.05	mg/L	Caltest	12/2/22	12/7/22
SE82	MS-14	12/1/2022	Iron	EPA 200.8	=	0.43	0.005	0.05	mg/L	Caltest	12/6/22	12/9/22
DW54	MS-14	4/26/2023	Iron	EPA 200.8	=	0.15	0.005	0.05	mg/L	Caltest	5/1/23	5/2/23
DW55	MS-14	6/8/2023	Iron	EPA 200.8	=	0.089	0.005	0.05	mg/L	Caltest	6/14/23	6/15/23
DW52	MS-14R	8/31/2022	Iron	EPA 200.8	=	0.61	0.005	0.05	mg/L	Caltest	9/2/22	9/6/22
SE81	MS-14R	11/8/2022	Iron	EPA 200.8	=	0.8	0.005	0.05	mg/L	Caltest	11/14/22	11/17/22
DW53	MS-14R	11/29/2022	Iron	EPA 200.8	=	0.17	0.005	0.05	mg/L	Caltest	12/2/22	12/7/22
SE82	MS-14R	12/1/2022	Iron	EPA 200.8	=	0.49	0.005	0.05	mg/L	Caltest	12/6/22	12/9/22
DW54	MS-14R	4/26/2023	Iron	EPA 200.8	=	0.81	0.005	0.05	mg/L	Caltest	5/1/23	5/2/23
DW55	MS-14R	6/8/2023	Iron	EPA 200.8	=	1.1	0.005	0.05	mg/L	Caltest	6/14/23	6/15/23
DW52	MS-14RUS	8/31/2022	Iron	EPA 200.8	=	0.78	0.005	0.05	mg/L	Caltest	9/2/22	9/6/22
DW55	MS-14RUS	6/8/2023	Iron	EPA 200.8	=	0.81	0.005	0.05	mg/L	Caltest	6/14/23	6/15/23
DW52	MS-2D	8/31/2022	Iron	EPA 200.8	=	0.09	0.005	0.05	mg/L	Caltest	9/2/22	9/12/22
SE81	MS-2D	11/8/2022	Iron	EPA 200.8	=	1.8	0.005	0.05	mg/L	Caltest	11/14/22	11/17/22
DW53	MS-2D	11/29/2022	Iron	EPA 200.8	=	0.1	0.005	0.05	mg/L	Caltest	12/2/22	12/7/22
SE82	MS-2D	12/1/2022	Iron	EPA 200.8	=	1.7	0.005	0.05	mg/L	Caltest	12/6/22	12/9/22
DW54	MS-2D	4/26/2023	Iron	EPA 200.8	=	1	0.005	0.05	mg/L	Caltest	5/1/23	5/2/23
DW55	MS-2D	6/8/2023	Iron	EPA 200.8	J	0.049	0.005	0.05	mg/L	Caltest	6/14/23	6/15/23
DW52	MS-4D	8/31/2022	Iron	EPA 200.8	=	0.36	0.005	0.05	mg/L	Caltest	9/2/22	9/6/22
SE81	MS-4D	11/8/2022	Iron	EPA 200.8	=	0.85	0.005	0.05	mg/L	Caltest	11/14/22	11/17/22
DW53	MS-4D	11/29/2022	Iron	EPA 200.8	=	1.7	0.005	0.05	mg/L	Caltest	12/2/22	12/5/22
SE82	MS-4D	12/1/2022	Iron	EPA 200.8	=	2.7	0.005	0.05	mg/L	Caltest	12/6/22	12/9/22
DW54	MS-4D	4/26/2023	Iron	EPA 200.8	=	0.42	0.005	0.05	mg/L	Caltest	5/1/23	5/2/23
DW55	MS-4D	6/8/2023	Iron	EPA 200.8	=	0.59	0.005	0.05	mg/L	Caltest	6/14/23	6/15/23
SE81	NE-RAIN	11/8/2022	Bifenthrin	EPA 625.1	=	0.68	0.3	0.5	ng/L	Caltest	11/11/22	11/18/22
SE82	NE-RAIN	12/1/2022	Bifenthrin	EPA 625.1	=	1.3	0.3	0.5	ng/L	Caltest	12/2/22	12/18/22
SE81	SC-RAIN	11/8/2022	Bifenthrin	EPA 625.1	=	0.59	0.3	0.5	ng/L	Caltest	11/11/22	11/18/22

Event	Site Code	Date Sampled	Analyte	Analytical Method	Q	Result	MDL	RL/ML	Units	Lab Name	Prep Date	Analysis Date
SE82	SC-RAIN	12/1/2022	Bifenthrin	EPA 625.1	=	1.6	0.3	0.5	ng/L	Caltest	12/2/22	12/17/22
SE81	NE-RAIN	11/8/2022	Cyfluthrin	EPA 625.1	<	ND	0.4	0.5	ng/L	Caltest	11/11/22	11/18/22
SE82	NE-RAIN	12/1/2022	Cyfluthrin	EPA 625.1	<	ND	0.4	0.5	ng/L	Caltest	12/2/22	12/18/22
SE81	SC-RAIN	11/8/2022	Cyfluthrin	EPA 625.1	<	ND	0.4	0.5	ng/L	Caltest	11/11/22	11/18/22
SE82	SC-RAIN	12/1/2022	Cyfluthrin	EPA 625.1	<	ND	0.4	0.5	ng/L	Caltest	12/2/22	12/17/22
SE81	NE-RAIN	11/8/2022	Cypermethrin	EPA 625.1	<	ND	0.3	0.5	ng/L	Caltest	11/11/22	11/18/22
SE82	NE-RAIN	12/1/2022	Cypermethrin	EPA 625.1	<	ND	0.3	0.5	ng/L	Caltest	12/2/22	12/18/22
SE81	SC-RAIN	11/8/2022	Cypermethrin	EPA 625.1	<	ND	0.3	0.5	ng/L	Caltest	11/11/22	11/18/22
SE82	SC-RAIN	12/1/2022	Cypermethrin	EPA 625.1	<	ND	0.3	0.5	ng/L	Caltest	12/2/22	12/17/22
SE81	NE-RAIN	11/8/2022	Esfenvalerate/Fenvalerate	EPA 625.1	<	ND	0.4	1	ng/L	Caltest	11/11/22	11/18/22
SE82	NE-RAIN	12/1/2022	Esfenvalerate/Fenvalerate	EPA 625.1	<	ND	0.4	1	ng/L	Caltest	12/2/22	12/18/22
SE81	SC-RAIN	11/8/2022	Esfenvalerate/Fenvalerate	EPA 625.1	<	ND	0.4	1	ng/L	Caltest	11/11/22	11/18/22
SE82	SC-RAIN	12/1/2022	Esfenvalerate/Fenvalerate	EPA 625.1	<	ND	0.4	1	ng/L	Caltest	12/2/22	12/17/22
SE81	NE-RAIN	11/8/2022	Lambda-Cyhalothrin	EPA 625.1	<	ND	0.3	0.5	ng/L	Caltest	11/11/22	11/18/22
SE82	NE-RAIN	12/1/2022	Lambda-Cyhalothrin	EPA 625.1	<	ND	0.3	0.5	ng/L	Caltest	12/2/22	12/18/22
SE81	SC-RAIN	11/8/2022	Lambda-Cyhalothrin	EPA 625.1	<	ND	0.3	0.5	ng/L	Caltest	11/11/22	11/18/22
SE82	SC-RAIN	12/1/2022	Lambda-Cyhalothrin	EPA 625.1	<	ND	0.3	0.5	ng/L	Caltest	12/2/22	12/17/22
SE81	NE-RAIN	11/8/2022	Permethrin	EPA 625.1	<	ND	2	5	ng/L	Caltest	11/11/22	11/18/22
SE82	NE-RAIN	12/1/2022	Permethrin	EPA 625.1	<	ND	2	5	ng/L	Caltest	12/2/22	12/18/22
SE81	SC-RAIN	11/8/2022	Permethrin	EPA 625.1	<	ND	2	5	ng/L	Caltest	11/11/22	11/18/22
SE82	SC-RAIN	12/1/2022	Permethrin	EPA 625.1	<	ND	2	5	ng/L	Caltest	12/2/22	12/17/22

Notes:

J = Estimated (Data Not Quantified) above the MDL and below the RL

APPENDIX C

2022-2023 Data Summary Tables

MOSHER SLOUGH 2022-2023 ANNUAL MONITORING DATA TABLES

Urban Discharge and Receiving Water Data

Event	Date	MS-13	MS-14	MS-14R	MS-14RUS	MS-2D	MS-4D
Indicator Bacteria							
***E. Coli*, MPN/100mL**							
DW52	8/31/2022	860	1,014	161	402	173	<10
SE81	11/8/2022	4,352	2,909	794	-	6,867	14,136
DW53	11/29/2022	10	<10	135	-	40	52
SE82	12/1/2022	4,611	1,223	2,187	-	2,909	1,565
DW54	4/26/2023	10	<10	98	-	135	134
DW55	6/8/2023	86	31	187	74	132	882
Fecal Coliform, MPN/100mL							
DW52	8/31/2022	130	16,0000	9,400	5,400	17,000	630
SE81	11/8/2022	6,300	2,400	92,000	-	54,000	92,000
DW53	11/29/2022	700	1,700	110	-	460	460
SE82	12/1/2022	5,400	1,700	3,500	-	7,000	5,400
DW54	4/26/2023	23	23	79	-	1,600	170
DW55	6/8/2023	170	26	350	460	3,500	130
Field Measurement							
Dissolved Oxygen, mg/L							
DW52	8/31/2022	4.5	3.6	7.2	8.36	7.2	2.54
SE81	11/8/2022	8.6	4.2	8.7	-	8.0	8.6
DW53	11/29/2022	4.75	3.35	9.75	-	7.4	1.47
SE82	12/1/2022	8.9	9.2	9.1	-	9.8	8.9
DW54	4/26/2023	6.0	4.7	5.6	-	7.0	6.3
DW55	6/8/2023	6.0	6.9	6.1	8.5	10.5	5.6
pH, SU							
DW52	8/31/2022	7.26	7.07	7.17	7.66	7.62	6.95
SE81	11/8/2022	6.83	6.69	7.23	-	6.43	6.75
DW53	11/29/2022	7.08	7.33	7.82	-	7.51	7.02
SE82	12/1/2022	7.33	7.04	7.80	-	7.17	7.01
DW54	4/26/2023	7.40	7.45	7.65	-	7.75	7.76
DW55	6/8/2023	7.04	7.27	7.62	8.09	7.58	7.54

Event	Date	MS-13	MS-14	MS-14R	MS-14RUS	MS-2D	MS-4D
Specific Conductance, µmhos/cm							
DW52	8/31/2022	623	438.2	126	207	292	213.5
SE81	11/8/2022	293	159	128	-	51	17
DW53	11/29/2022	794	543	477	-	532	314
SE82	12/1/2022	133	68	208	-	59	67
DW54	4/26/2023	715	705	165	-	418	671
DW55	6/8/2023	377	705	132	150	309	222
Temperature, ºC							
DW52	8/31/2022	21.9	21.1	22.6	21.4	21.5	21.7
SE81	11/8/2022	15.8	15.2	13.0	-	13.4	13.7
DW53	11/29/2022	19.8	19.4	11.2	-	16.4	14.7
SE82	12/1/2022	11.8	11.6	10.9	-	11.8	11.9
DW54	4/26/2023	19.8	19.8	19.7	-	16.8	15.6
DW55	6/8/2023	20.1	19.9	21.5	18.4	18.1	17.7
Mercury							
Methyl Mercury, ng/L							
DW52	8/31/2022	<0.02	<0.02	0.023	0.1	0.031	0.063
SE81	11/8/2022	0.043	0.07	0.11	-	0.089	0.10
DW53	11/29/2022	0.031	<0.02	<0.02	-	0.025	0.31
SE82	12/1/2022	0.63	0.13	0.091	-	0.15	0.27
DW54	4/26/2023	<0.02	<0.02	0.094	-	0.28	0.094
DW55	6/8/2023	0.042	<0.02	0.059	0.18	0.044	0.14
Total Mercury, ng/L							
DW52	8/31/2022	2.4	1.5	1.4	2.4	1.6	1.0
SE81	11/8/2022	3.6	3.0	4.1	-	5.1	4.2
DW53	11/29/2022	1.7	1.5	0.8	-	1.4	1.8
SE82	12/1/2022	3.1	2.2	1.7	-	3.8	4.6
DW54	4/26/2023	2.0	2.2	3.1	-	5.2	2.3
DW55	6/8/2023	0.97	1.8	3.2	2.4	0.73	1.1
Metals							
Aluminum, µg/L							
DW52	8/31/2022	80	99	468	475	56	40
SE81	11/8/2022	257	237	394	-	1,140	555
DW53	11/29/2022	61	8.1	140	-	90	36
SE82	12/1/2022	3,130	276	313	-	1,160	1,730
DW54	4/26/2023	60	58	501	-	608	127
DW55	6/8/2023	46	18	675	463	20	34

Event	Date	MS-13	MS-14	MS-14R	MS-14RUS	MS-2D	MS-4D
Iron, mg/L							
DW52	8/31/2022	0.093	0.18	0.61	0.78	0.09	0.36
SE81	11/8/2022	0.42	0.37	0.8	-	1.8	0.85
DW53	11/29/2022	0.26	0.12	0.17	-	0.1	1.7
SE82	12/1/2022	4.8	0.43	0.49	-	1.7	2.7
DW54	4/26/2023	0.22	0.15	0.81	-	1.0	0.42
DW55	6/8/2023	0.064	0.089	1.1	0.81	0.049	0.59

RAINWATER/ATMOSPHERIC DEPOSITION MONITORING DATA

Event	Date	NE-RAIN	SC-RAIN
Field Measurement			
Dissolved Oxygen, mg/L			
SE81	11/8/2022	11.7	9.6
SE82	12/1/2022	10.5	10.7
pH, SU			
SE81	11/8/2022	8.86	8.64
SE82	12/1/2022	6.98	7.26
Specific Conductance, µmhos/cm			
SE81	11/8/2022	13.9	8.1
SE82	12/1/2022	9.0	11.3
Temperature, ºC			
SE81	11/8/2022	10.8	11.6
SE82	12/1/2022	7.9	10.3
Mercury			
Methyl Mercury, ng/L			
SE81	11/8/2022	0.088	0.068
SE82	12/1/2022	0.087	0.13
Total Mercury, ng/L			
SE81	11/8/2022	1.7	1.6
SE82	12/1/2022	1.6	1.9

Event	Date	NE-RAIN	SC-RAIN
Pyrethroids			
Bifenthrin, ng/L			
SE81	11/8/2022	0.68	0.59
SE82	12/1/2022	1.3	1.6
Cyfluthrin, ng/L			
SE81	11/8/2022	<0.4	<0.4
SE82	12/1/2022	<0.4	<0.4
Cypermethrin, ng/L			
SE81	11/8/2022	<0.3	<0.3
SE82	12/1/2022	<0.3	<0.3
Esfenvalerate/Fenvalerate, ng/L			
SE81	11/8/2022	<0.4	<0.4
SE82	12/1/2022	<0.4	<0.4
Lambda-Cyhalothrin, ng/L			
SE81	11/8/2022	<0.3	<0.3
SE82	12/1/2022	<0.3	<0.3
Permethrin, ng/L			
SE81	11/8/2022	<2	<2
SE82	12/1/2022	<2	<2

APPENDIX D

Delta RMP Participation

- Letter Proposing Modifications to Monitoring Program due to Participation in Delta Regional Monitoring Program (June 10, 2015)
- Delta Regional Monitoring Program Participation Letter (November 4, 2015)
- Sacramento-San Joaquin Delta Regional Monitoring Program Annual Report For MS4 Reporting: Fiscal Year 2022-2023 (September 25, 2023)

CITY OF STOCKTON

MUNICIPAL UTILITIES • 2500 Navy Drive • Stockton, CA 95206 • 209-937-8700
www.stocktongov.com

June 10, 2015

Ms. Pamela Creedon, Executive Officer
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670-6114

CITY OF STOCKTON AND COUNTY OF SAN JOAQUIN SUBMITTAL OF ALTERNATIVE STORMWATER MONITORING PROGRAM (ORDER NO. R5-2015-0024, NPDES PERMIT NO. CAS083470)

In accordance with Provision II of the Monitoring and Reporting Program (MRP) in Order No. R5-2015-0024 (Permit), the City of Stockton (City) and the County of San Joaquin (County) are submitting an Alternative Monitoring Program (AMP), enclosed as Attachment A, for your consideration and approval. The AMP (as outlined in Attachment A) is proposed in lieu of the Monitoring Program outlined in Section II of the MRP. The Permittees hope to implement the AMP by July 1, 2015 (for the 2015-2016 fiscal year).

The AMP meets the objectives of the MRP, directs resources to the most critical water quality issues, and collects data to support management decisions to address those water quality issues. The AMP also provides details on the approach, locations, constituents monitored, and monitoring frequency. The AMP is based on the monitoring approach proposed in the ROWD, which represents a more focused effort than the current monitoring program. The current monitoring program assesses the impact of urban discharges on receiving waters, but it not well suited to determine the sources of pollutants in order to implement control measures. The AMP focuses on pollutants of concern and implements an intensive monitoring approach to determine the source(s) of pollutants in urban discharges. The Permittees, however, recognize the value of the historic data and will continue monitoring for an extensive suite of constituents at sites that have been historically monitored.

In addition, and in accordance with Provision II of the MRP, the City and County are requesting to participate in the Delta Regional Monitoring Program (Delta RMP) in lieu of conducting additional local water quality monitoring. Instead of monitoring two waterbodies per year, the City and County will monitor one waterbody per year as a part of the AMP and participate in the Delta RMP. This is addressed in more detail in Attachment A.

The City and County request a meeting at your earliest convenience to review and discuss the approval of the AMP and participation in the Delta RMP so that implementation can efficiently begin without delay at the start of the new fiscal year (FY 2015-2016).

If you have any questions, please contact Christina Walter of City of Stockton at (209) 937-8155 or Christina.Walter@stocktongov.com or Brandon Nakagawa of San Joaquin County at (209) 953-7460 or bnakagawa@sjgov.org.

Sincerely,

C. MEL LYTLE, Ph.D.,
DIRECTOR OF MUNICIPAL UTILITIES
CITY OF STOCKTON

BRANDON W. NAKAGAWA, P.E.
WATER RESOURCES MANAGER
COUNTY OF SAN JOAQUIN

cc: B. Than, City of Stockton
C. Walter, City of Stockton
G. Dominguez, County of San Joaquin
K. Ashby, Larry Walker Associates

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ALTERNATIVE WATER QUALITY MONITORING PROGRAM

This proposed Alternative Water Quality Monitoring Program (Monitoring Program) is a focused monitoring effort conducted within key urban water bodies on a rotating basis. The extensive drainageshed-specific monitoring provides broad geographical coverage and comprehensive outfall source monitoring. In addition, the Monitoring Program supports participation of the City of Stockton (City) and the County of San Joaquin (County) in and implementation of the Delta Regional Monitoring Program (Delta RMP).

The Monitoring Program consists of the following components:

1. **Delta RMP** – The City and County will participate in the Delta RMP in lieu of conducting monitoring in an additional waterbody (as outlined in #2 below) each year[1].

2. **Waterbody/Drainageshed Monitoring**

   - Locations - Six urban water bodies will be monitored on a rotating basis. These water bodies include the historic monitoring locations[2].
     - Mosher Slough
     - Calaveras River
     - Duck Creek
     - Smith Canal
     - Mormon Slough
     - Five-Mile Slough
   - Timeframe for Monitoring - Each water body will be comprehensively monitored for one year with a staggered schedule as shown in **Table 1**. This staggered schedule may be repeated in future stormwater permits in order to obtain additional data, if deemed necessary.

Table 1. Staggered Waterbody Monitoring

Waterbody	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2021-2022
Mosher Slough						
Calaveras River						
Duck Creek						
Smith Canal						
Mormon Slough						
Five-Mile Slough						

   - Monitoring Sites - For each waterbody/drainageshed the following will be conducted:
     - Within each waterbody, where applicable, the historic urban discharge/receiving water co-located monitoring sites will be monitored for a comprehensive suite of constituents **(Table 2)**.

[1] Instead of monitoring two waterbodies per year, the City and County will monitor one waterbody per year and participate in the Delta RMP. As of June 2015, 'participation' in the Delta RMP consists of a contribution of $50,000 total on behalf of the City and County.

[2] The waterbodies that have been monitored for years, and have 'historic' data and monitoring locations, include Mosher Slough, Calaveras River, Duck Creek, and Smith Canal.

- Within each waterbody, three to five outfalls with two to three paired urban discharge/receiving water sites will be monitored for the pollutants of concern (POCs) that were identified in the 2012 Report of Waste Discharge (ROWD)[3].
- One receiving water site will be monitored for sediment toxicity on each historic waterbody.
- Rainwater/atmospheric deposition will be monitored for mercury and pesticides at three representative locations in the SUA, independent of the rotating waterbody/drainageshed monitoring. Rainwater will be monitored each year at those sites during the three storm events. The Permittees will coordinate with the Regional Water Board to the extent appropriate to assess the contribution of air pollution sources to mercury and pesticides in stormwater.

- Monitoring Events
  - Each site will be monitored for three storm events per year with variable targeted storm intensity (guideline of 0.15''- 0.25'' in intensity):
    - One storm targeted for the first flush (~ October – November);
    - One storm between December and March; and
    - One storm between April and June.
  - Most wet weather samples will be grab samples taken during the first flush at the outfall site and roughly an hour later at the receiving water sites.
  - Each site will be monitored for four dry weather events[4]
    - Two dry weather events - ~ June to October; and
    - Two wet season dry weather events – ~ November - May.
  - Dry weather samples will be taken as grab samples at all sites.
  - Sediment toxicity will be monitored 2-4 days following one storm event and two dry weather events
- Monitored Constituents
  - A full suite of constituents (**Table 2**) will be monitored for the historic urban discharge and urban receiving water locations. At urban discharge sites, these samples will be collected using a flow weighted composite sample during wet weather.
  - For all of the other sites, water quality monitoring will be conducted for the constituents identified as Pollutants of Concern (POCs) within the given drainageshed. These include *E. coli*, fecal coliform, chlorpyrifos, pyrethroids (as an emerging POC), mercury (and methylmercury), and dissolved oxygen (DO).
  - Sediment toxicity will be monitored at urban receiving water sites on each historic waterbody.

---

[3] National Pollutant Discharge Elimination System Municipal Stormwater Program – *Report of Waste Discharge & Proposed Stormwater Management Plan*, June 2012 (Section 2.7; Tables 2-42, 2-43, 2-44, 2-45, 2-46, and 2-47).

[4] Dry weather event – an event proceeded by one week of dry weather

Table 2. Water Quality Constituents to be Monitored at Historic Sites

Constituents	Method Detection Limits (MLs)
Conventional Pollutants	**mg/L**
Oil and Grease	5
pH	0-14
Dissolved Oxygen	Sensitivity to 5 mg/L
Field Measurements	
Date	mm/dd/yyyy
Sample Time	hr:min (regular time)
Weather	degrees F
Water Temperature	degrees C
Bacteria	
Fecal coliform	<20 MPN/100 mL
E. coli	<20 MPN/100 mL
General	**mg/L**
Turbidity	0.1 NTU
Total Suspended Solids	2
Total Dissolved Solids	2
Total Organic Carbon	1
Biochemical Oxygen Demand	2
Chemical Oxygen Demand	20-900
Total Kjeldahl Nitrogen	0.1
Alkalinity	2
Total Ammonia-Nitrogen	0.1
Specific Conductance	1 µmho/cm
Total Hardness	2
Metals	**µg/L**
Aluminum, Dissolved	50
Aluminum, Total	50
Copper, Dissolved	0.5
Copper, Total	0.5
Iron, Total	100
Lead, Dissolved	0.5
Lead, Total	0.5
Mercury, Total	0.5 ng/L
Methylmercury, Total	0.05 ng/L
Zinc, Total	1
Pesticides	**µg/L**
Chlorpyrifos	0.01
Pyrethroids	5 ng/L

Waterbody/Drainageshed Monitoring

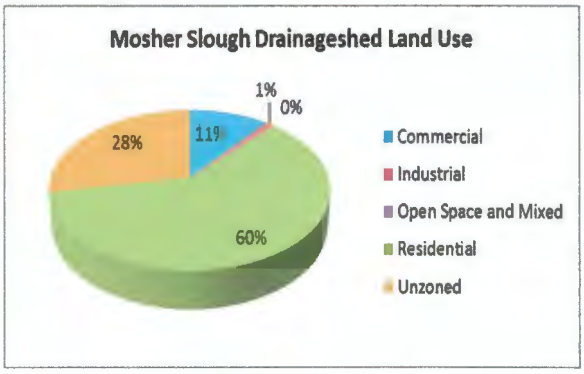
The following sections detail the monitoring that will occur in each drainageshed. Each will be monitored for its own set of constituents based on adopted TMDLs, 303(d) listings, and/or urban discharge and receiving water determination of POCs. The following elements are included in each drainageshed-specific approach:

- Description of the waterbody/drainageshed;
- Selected monitoring sites (shown in maps);
- Monitoring that will occur at each site (shown in tables); and
- Rationale for the selection of each monitoring site.

Monitoring sites are subject to change during the Permit term based on new information gathered by the Permittees. If sites are modified, this will be communicated to Regional Water Board staff.

Mosher Slough

Mosher Slough is one of Stockton's least-improved waterways and is located in the northern portion of the SUA. The urbanized portion of Mosher Slough flows naturally only when it receives input from upstream agricultural flow/tail waters or surface water runoff. In general, Mosher Slough is a shallow waterway that increases in depth west of the SUA; at high tide, the water level immediately west of I-5 is approximately four to five feet above mean sea level.



Land use within the urbanized portion of the Mosher Slough drainageshed is primarily residential with a small percentage being commercial, industrial, and public lands. To the west of I-5, land use is predominantly agricultural. In addition to urban runoff, Mosher Slough receives inflow from upstream agricultural runoff and agricultural return (tail water). Monitoring sites are shown in **Figure 1** and listed in **Table 3**.

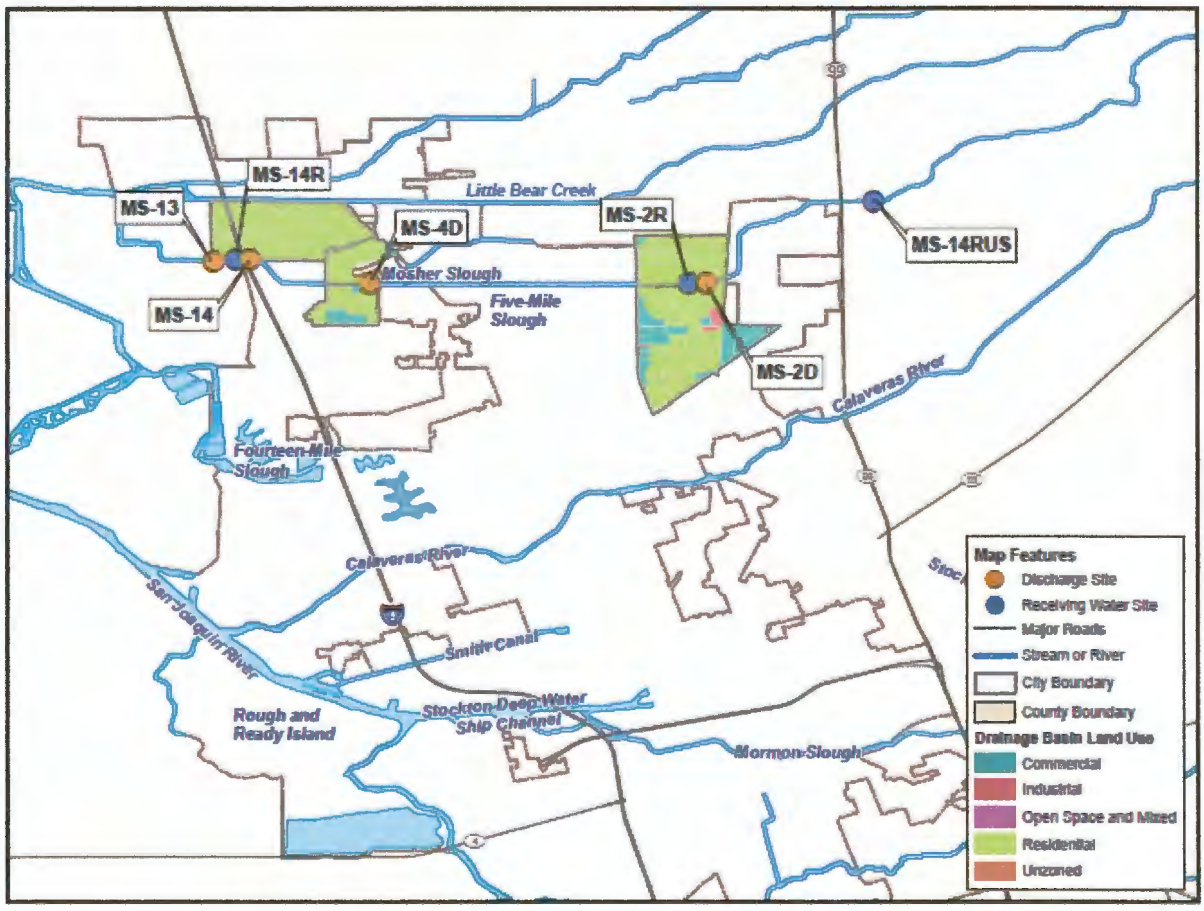


Figure 1. Mosher Slough Monitoring Sites and Discharge Site Drainagesheds

Table 3. Mosher Slough Monitoring Sites and Constituents Monitored

Constituents Monitored	Type of Monitoring	Sites Monitored						
		MS-14RUS	MS-2D	MS-2R	MS-4D	MS-14[1]	MS-14R[1]	MS-13
Full suite of constituents (**Table 2**)	Water quality					C	G	
E. coli and fecal coliform	Water quality	G	G	G	G			G
Chlorpyrifos and pyrethroids	Water quality	G	G	G	G			G
Mercury (and methylmercury)	Water quality	G	G	G	G			G
Sediment toxicity	Sediment toxicity						Sed	

Notes:
1. Historic Monitoring Site
G = Grab
C = Composite
Sed = Sediment

The monitoring sites in Mosher Slough include the following:

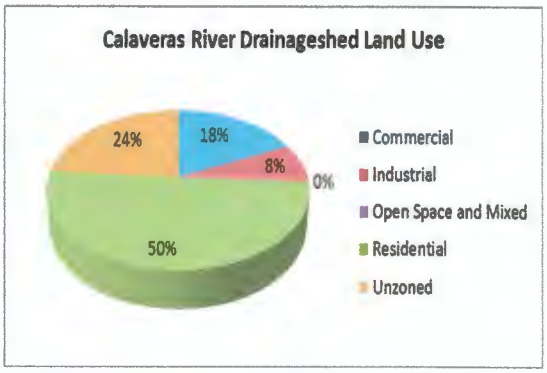
- MS-14RUS – Measures receiving water quality flowing into the SUA.
- MS-2D – Outfall with flow from an older residential establishment.
    - Paired with receiving water site MS-2R.
- MS-4D – Outfall selected as a midpoint along the waterbody with flow primarily from a residential area.
- MS-13 and MS-14 were selected to cover the areas downstream of I-5 where Mosher Slough has the most 303(d) listings. Both outfalls drain areas that are primarily residential
    - MS-14[5] is paired with receiving water site MS-14R[6]. Both are historic water quality monitoring sites.

[5] Monitored since 1992

[6] Monitored since 2002

Calaveras River

The Calaveras River drainageshed[7] is a tributary to the San Joaquin River (SJR) Delta System flowing southwest from the Sierra Nevada foothills through Calaveras, Stanislaus, and San Joaquin Counties and drains approximately 470 square miles. Within the SUA, land use along the Calaveras River is predominantly residential and commercial, but also includes some industrial. In addition to urban runoff, the Calaveras River receives upstream agricultural flows from the Stockton Diversion Canal and "old" Calaveras channel. The monitoring sites are shown in **Figure 2** and listed in **Table 4**.



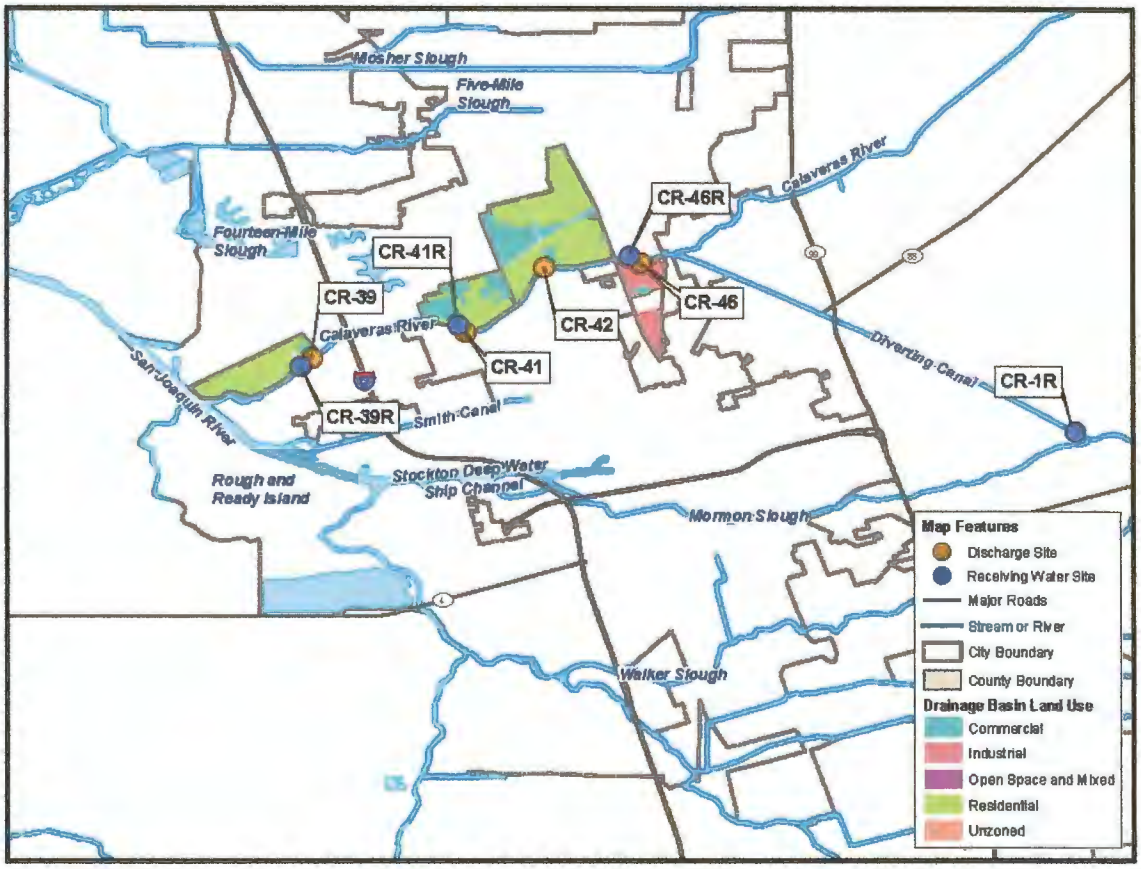


Figure 2. Calaveras River Monitoring Sites and Discharge Site Drainagesheds

[7] Department of Water Resources, *Calaveras River Fish Migration Barriers Assessment Report*, September 2007.

Table 4. Calaveras River Monitoring Sites and Constituents Monitored

Constituents Monitored	Type of Monitoring	Sites Monitored							
		CR-1R	CR-46[1]	CR-46R[1]	CR-42	CR-41	CR-41R	CR-39	CR-39R
Full suite of constituents (**Table 2**)	Water quality		C	G					
E. coli and fecal coliform	Water quality	G			G	G	G	G	G
Chlorpyrifos and pyrethroids	Water quality	G			G	G	G	G	G
Mercury (and methylmercury)	Water quality	G			G	G	G	G	G
DO & biological oxygen demand (BOD)	Water quality	G			G	G	S & G	G	S & G
Sediment toxicity	Sediment toxicity			Sed					

Notes:
1. Historic Monitoring Site
G = Grab
C = Composite
Sed = Sediment
S = Sonde

The monitoring sites in Calaveras River include the following:

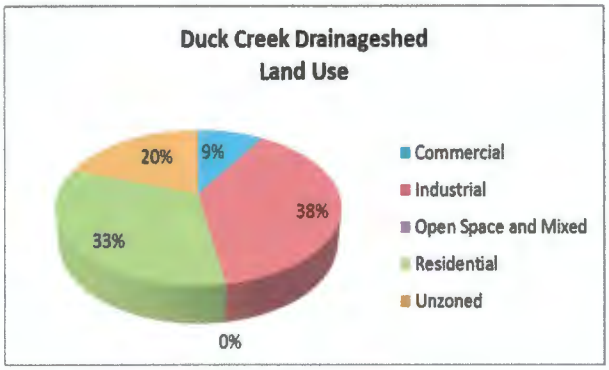
- CR-1R – Measures receiving water quality flowing into the SUA.
- CR-46[8] - Outfall with flow from a predominantly commercial/residential area with minor industrial uses.
    - Paired with receiving water site CR-46R[9]. Both sites are historic water quality monitoring sites.
- CR-42, CR-41, and CR39 – Outfalls that each drain mixed commercial and residential areas.
    - CR-41 is paired with receiving water site CR-41R, and CR-39 is paired with receiving water site CR-39R.
    - Sondes will be placed at CR-41R and CR-39R, where flow can sustain the equipment.

[8] Monitored since 1992

[9] Monitored since 2002

Duck Creek

Duck Creek's headwaters are in Stanislaus County from which it meanders westerly before ending just south/southwest of downtown Stockton. East of the SUA, Duck Creek flows through predominantly open space and agricultural areas. Between El Dorado Street and I-5 Duck Creek drains into Walker Slough which continues approximately 700 feet west to its confluence with French Camp Slough. From the convergence point, Walker Slough extends approximately 600 feet west to its confluence with the SJR.



Duck Creek/Walker Slough (Duck Creek) has a mixed-use watershed with residential, commercial and industrial land uses. Duck Creek receives inputs from groundwater, tidal exchange, the urban runoff, and agricultural runoff and agricultural return (tail water). Sites that will be monitored are shown in **Figure 3** and listed in listed in **Table 5**.

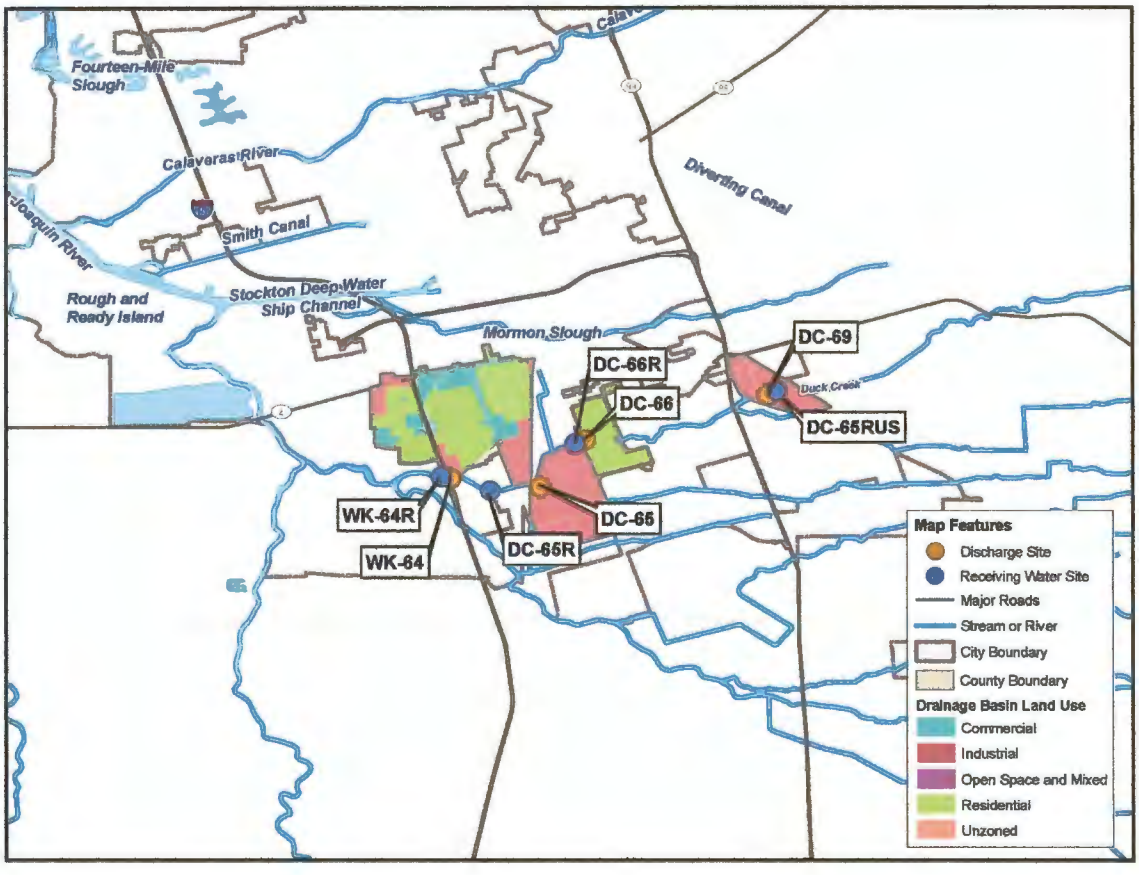


Figure 3. Duck Creek Monitoring Sites and Discharge Drainagesheds

Table 5. Duck Creek Monitoring Sites and Constituents Monitored

Constituents Monitored	Type of Monitoring	Sites Monitored							
		DC-65RUS	DC-69	DC-66[2]	DC-66R[2]	DC-65[1,3]	DC-65R[1,3]	WK-64	WK-64R
Full suite of constituents (**Table 2**)	Water quality					C	G		
E. coli and fecal coliform	Water quality	G	G	G	G			G	G
Chlorpyrifos and pyrethroids	Water quality	G	G	G	G			G	G
Mercury (and methylmercury)	Water quality	G	G	G	G			G	G
DO & biological oxygen demand (BOD)	Water quality	G	G	G	G			G	G
Sediment toxicity	Sediment toxicity						Sed		

Notes:
1. Historic Monitoring Site
2. These sites will be monitored during dry weather only
3. These sites will be monitored during wet weather only
G = Grab
C = Composite
Sed = Sediment

The monitoring sites in Duck Creek include the following:

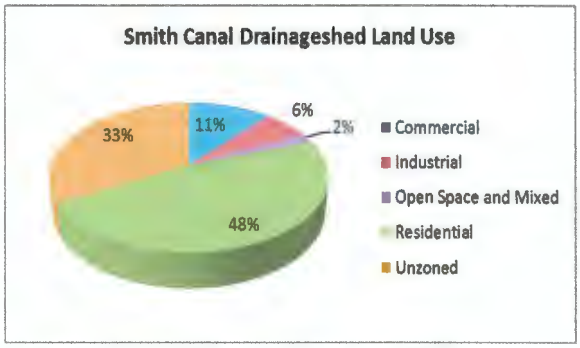
- DC-65RUS – Measures receiving water quality flowing into the SUA.
- DC-69 – Outfall with flow from an industrial area, on the eastern most reach of Duck Creek.
- DC-65[10] – Outfall with flow from a predominantly industrial area.
    - Paired with receiving water site DC-65R[11]. Both sites are historic water quality monitoring sites.
- DC-66 – Outfall with flow from a mixed-use area. Monitored in place of DC-65 during dry events, since flows from DC-65 are diverted to the sanitary sewer during most of the dry season.
    - Paired with receiving water site DC-66R.
- WK-64 – Outfall with flow from a mixed-use area.
    - Paired with receiving water site WK-64R.

[10] Monitored since 1992

[11] Monitored since 2002

Smith Canal

Smith Canal is a tidally influenced, shallow, east-west constructed freshwater slough that extends approximately 2.6 miles east from its confluence with the SJR to its upstream terminus at Yosemite Lake in central Stockton. The canal has an average depth of four to six feet (with a ten foot maximum depth at the mouth) and an approximate ebb to flood stage difference of up to four feet.



Smith Canal has a mixed-use watershed. Extensive DO monitoring was previously conducted in Smith Canal, and was reported in *Low Dissolved Oxygen Plan Final Report*, submitted on January 31, 2013. As such, DO monitoring is not a component of the monitoring approach for this water body. Sites that will be monitored are shown in **Figure 4** and listed in **Table 6**.

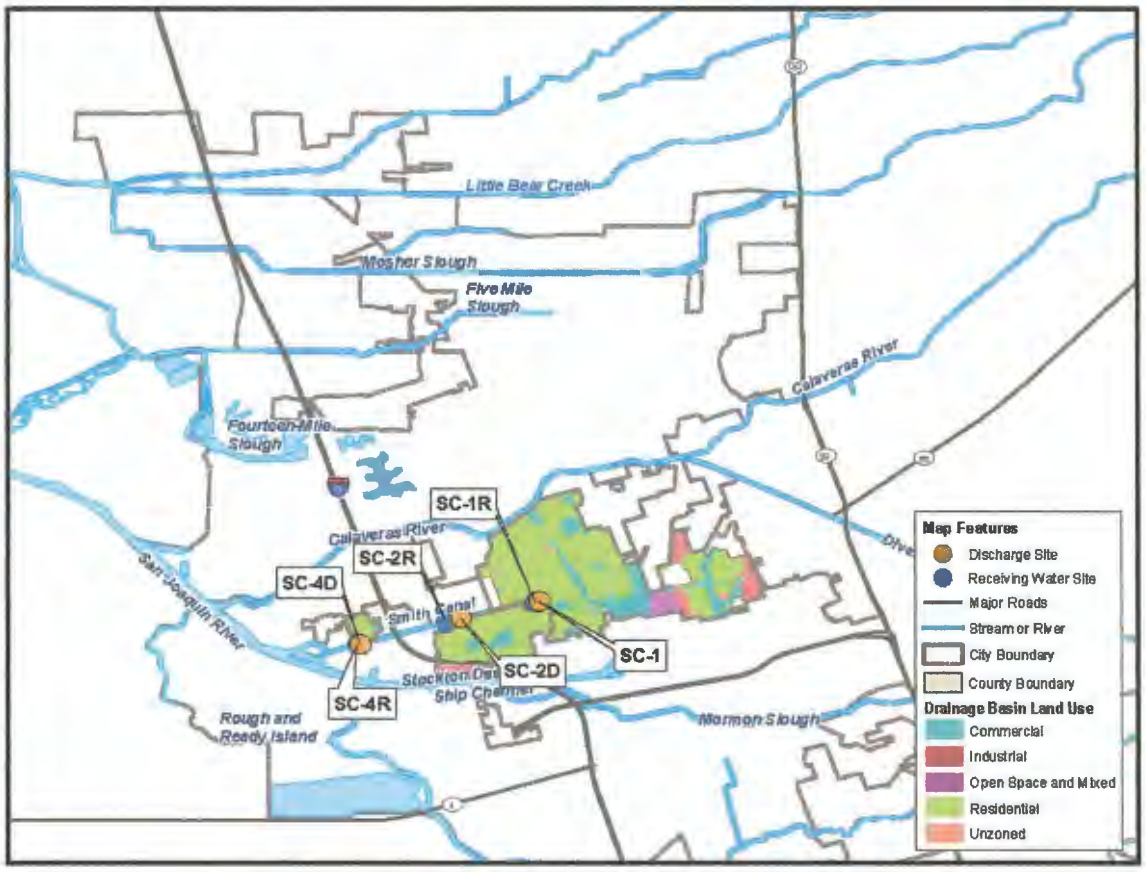


Figure 4. Smith Canal Monitoring Sites and Discharge Site Drainagesheds

Table 6. Smith Canal Monitoring Sites and Constituents Monitored

Constituents Monitored	Type of Monitoring	Sites Monitored					
		SC-1[1]	SC-1R[1]	SC-2D	SC-2R	SC-4D	SC-4R
Full suite of constituents (**Table 2**)	Water quality	C	G				
E. coli and fecal coliform	Water quality			G	G	G	G
Chlorpyrifos and pyrethroids	Water quality			G	G	G	G
Sediment toxicity	Sediment toxicity		Sed				

Notes:
1. Historic Monitoring Site
G = Grab
C = Composite
Sed = Sediment

The monitoring sites in Smith Canal include the following:

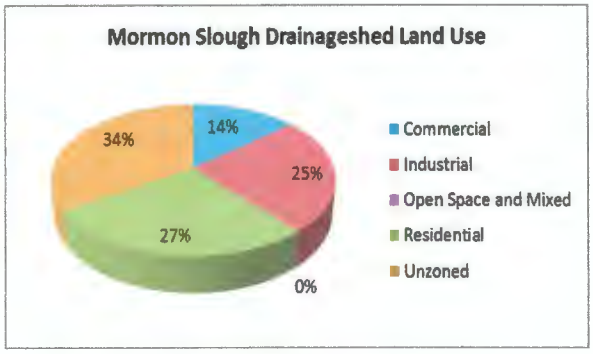
- SC-1[12] – Outfall in Yosemite Lake, representing the upstream portion of Smith Canal.
    - Paired with receiving water site SC-1R[13]. Both sites are historic water quality monitoring sites.
- SC-2D – Outfall midway along Smith Canal.
    - Paired with receiving water site SC-2R.
- SC-4D – Outfall at the western end of Smith Canal.
    - Paired with receiving water site SC-4R.

[12] Monitored since 2002

[13] Monitored since 2002

Mormon Slough

Mormon Slough has a mixed-use watershed with residential, commercial, and industrial land uses. It receives inputs from groundwater, tidal exchange, and urban runoff. Mormon Slough originally extended from its confluence with the Stockton Deep Water Ship Channel to the Calaveras River at the Bellota Weir. The Stockton Diversion Canal was built in 1910 to carry flows from Mormon Slough around the east side of the City and back to the Calaveras River. In 1969, the USACE modified Mormon Slough from its confluence with the Stockton Diversion upstream to the Bellota Weir to convey additional flood flows. Flow is not released downstream of the Bellota Weir except when flood releases are made from Hogan Dam or when stormwater flows into the river and channels. Consequently, stretches of Mormon Slough remain dry for days to months at a time during the winter and early spring. Overall, the slough is very shallow. Sites that will be monitored are shown in **Figure 5** and listed in **Table 7**.



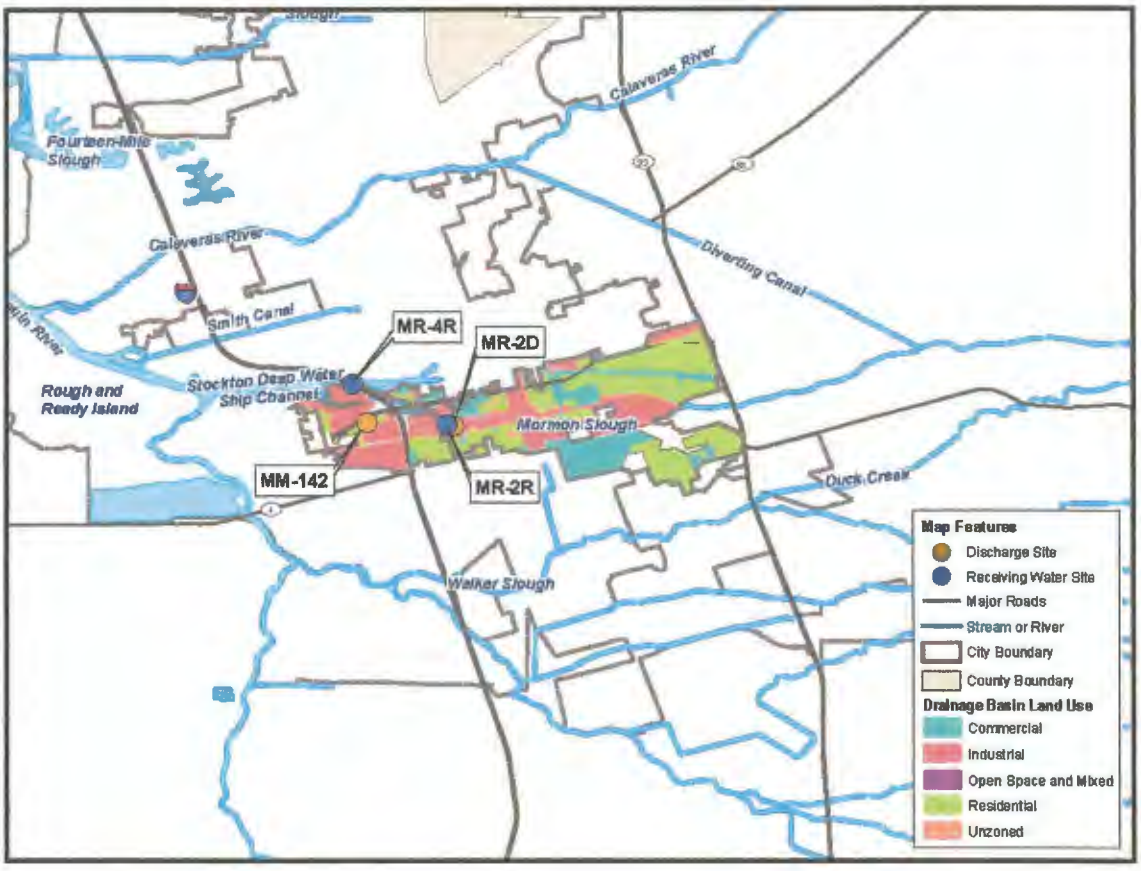


Figure 5. Mormon Slough Monitoring Sites and Discharge Sites Drainagesheds

Table 7. Mormon Slough Monitoring Sites and Constituents Monitored

Constituents Monitored	Type of Monitoring	Sites Monitored			
		MM-142	MR-2D	MR-2R	MR-4R
E. coli and fecal coliform	Water quality	G	G	G	G
DO & biological oxygen demand (BOD)	Water quality	G	G	G	S & G

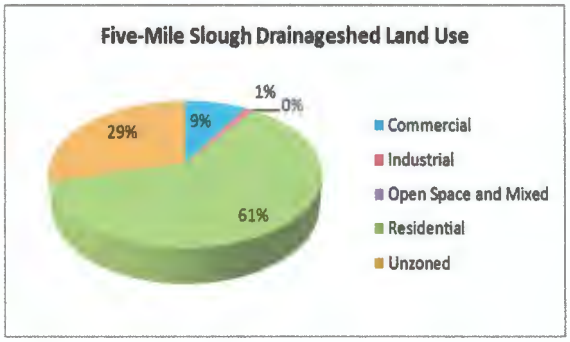
Notes:
G = Grab
S = Sonde

The monitoring sites in Mormon Slough include the following:

- MM-142 and MR-2D are the only pump stations on Mormon Slough. All other urban discharges are from gravity outfalls and are submerged.
- MR-2D – Outfall with flow from a mixed-use area.
    - Paired with receiving water site MR-2R.
- MR-4R - The farthest downstream location on Mormon Slough. A sonde can be deployed at this location for DO measurements.

Five-Mile Slough

Five-Mile Slough's watershed has primarily residential land use with some commercial land use. The waterbody meanders westward through residential areas, including the City's Swenson Park Golf Course, and unincorporated areas to Fourteen-Mile Slough, where a weir control tidal inflow from Fourteen-Mile Slough. During the summer, flow is reduced by diversion irrigation water from Five-Mile Slough to the park and golf course. It receives inputs from groundwater, tidal exchange, and urban runoff. West of I-5, the slough is estimated to be approximately ten feet deep. East of I-5 the slough is very shallow; water depth generally does not exceed four feet in the deepest portion of the waterbody. During the dry season, about one quarter of the easternmost channel is dry. Sites that will be monitored are shown in **Figure 6** and listed in **Table 8**.



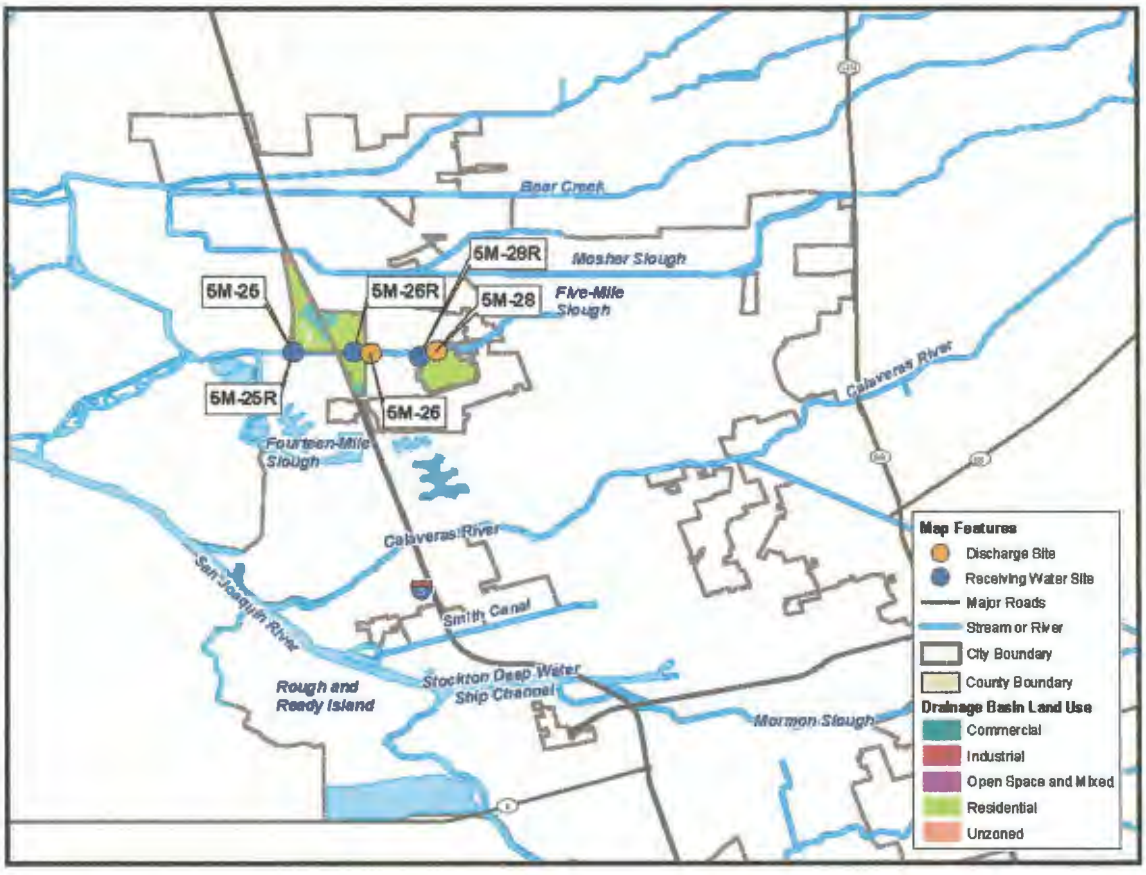


Figure 6. Five-Mile Slough Monitoring Sites and Discharge Site Drainagesheds

Table 8. Five-Mile Slough Monitoring Sites and Constituents Monitored

Constituents Monitored	Type of Monitoring	Sites Monitored					
		5M-28	5M-28R	5M-26	5M-26R	5M-25	5M-25R
E. coli and fecal coliform	Water quality	G	G	G	G	G	G
Chlorpyrifos and pyrethroids	Water quality	G	G	G	G	G	G
DO & biological oxygen demand (BOD)	Water quality	G	G	G	G	G	S & G

Notes:
G = Grab
S = Sonde

The monitoring sites in Five-Mile Slough include the following:

- 5M-28 – Outfall with flow from a predominantly residential area.
    - Paired with receiving water site 5M-28R.
- 5M-26 – Outfall with flow from a residential and commercial area.
    - Paired with receiving water site 5M-26R.
- 5M-25 – Outfall with flow from a mixed-use area.
    - Paired with receiving water site 5M-25R. A sonde can be deployed at 5M-25R for downstream DO measurements.

Rainwater/Atmospheric Deposition Monitoring

Rainwater/atmospheric deposition will be monitored for mercury (total mercury and total methylmercury) and pesticides (chlorpyrifos & pyrethroids) at three representative locations in the SUA, independent of the rotating waterbody/drainageshed monitoring. The locations are shown in **Figure 7.** These sites will be monitored during three rain events each year.

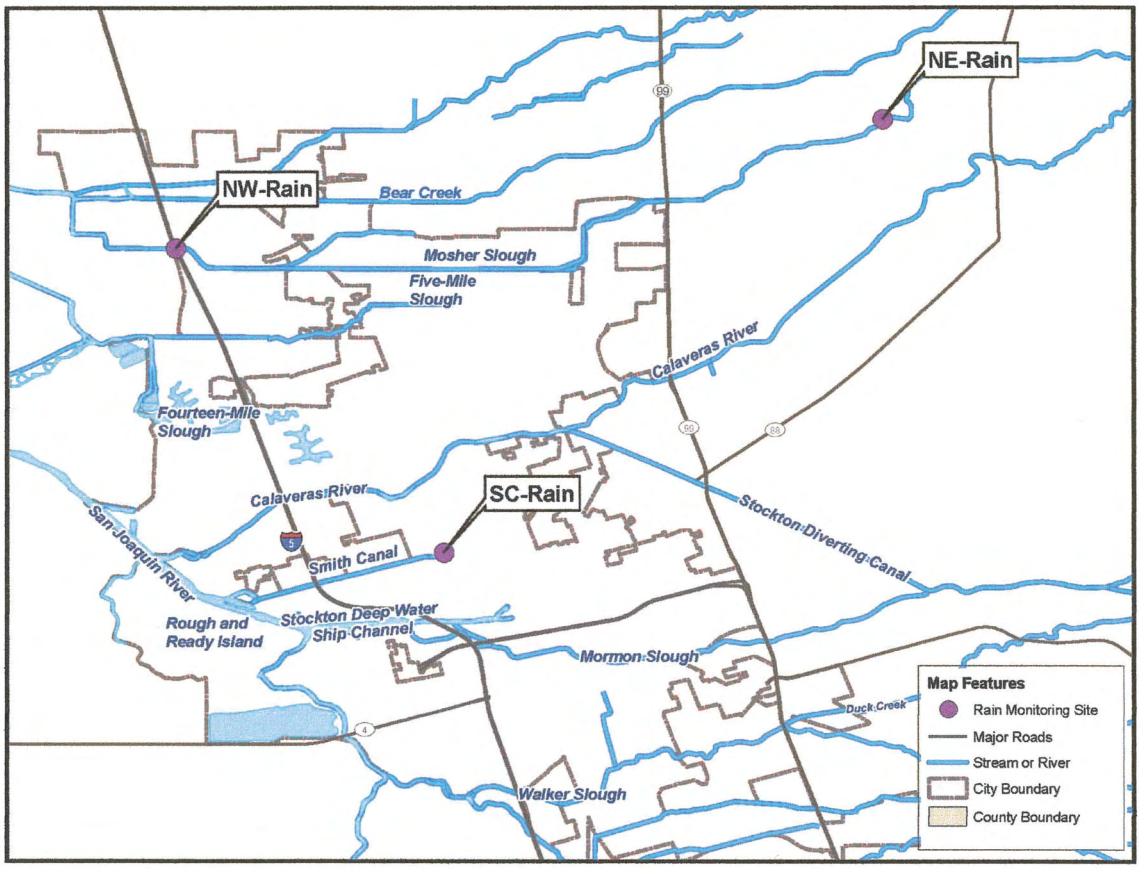


Figure 7. Rainwater/Atmospheric Deposition Monitoring Locations

The monitoring sites include the following:

- NW-Rain – Located along Mosher Slough in the Northwest corner of the SUA. This site has been historically monitored for the Pesticide Plan. The site is representative of atmospheric deposition generated within and outside of the SUA.
- NE-Rain – Located along Mosher Slough outside of the SUA, to the Northeast. This site has been historically monitored for the Pesticide Plan. The site is representative of atmospheric deposition generated outside of the SUA.
- SC-Rain – Located at the Legion Park Pump Station, in the center of the SUA. This site is representative of atmospheric deposition that is generated within the SUA.

CALIFORNIA
Water Boards

Central Valley Regional Water Quality Control Board

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

4 November 2015

Michael Snelling, Deputy Director
San Joaquin County
Department of Public Works
1810 E. Hazelton Avenue
Stockton, CA 95201

C. Mel Lytle, Ph. D., Director
City of Stockton
Department of Municipal Utilities
425 N. El Dorado Street
Stockton, CA 95202

APPROVAL TO ALLOW THE CITY OF STOCKTON AND COUNTY OF SAN JOAQUIN TO REDUCE LOCAL WATER QUALITY MONITORING AND PARTICIPATE IN THE DELTA REGIONAL MONITORING PROGRAM

Thank you for submitting your 10 June 2015 letter to the Central Valley Regional Water Quality Control Board (Central Valley Water Board) proposing 1) an alternative monitoring plan for the City of Stockton (City) and the County of San Joaquin (County), and 2) reductions in water quality monitoring in order to participate in the Delta Regional Monitoring Program (Delta RMP). Monitoring reductions are allowed by Order R5-2015-0024 (NPDES CAS083470) for Storm Water Discharges from Municipal Separate Storm Sewer Systems (MS4 Permit). On 4 November 2015, I approved the Alternative Monitoring Plan for the City and County.

I approve the proposed reductions in water quality monitoring according to Tables 1 and 2 (attached) in order for the City and County to participate in the Delta RMP. This approval does not reduce other monitoring requirements outside of Section III of the MS4 Permit's monitoring and reporting program.

The City and County estimates that their combined annual contribution of $58,200 to the Delta RMP is reasonably equivalent to the costs the agencies would have incurred absent the monitoring reductions. While this letter approves reductions in water quality monitoring for participation in the Delta RMP, the Delta RMP Steering Committee ultimately will determine a process for defining adequate participation in the Delta RMP. The $58,200 annual contribution is the minimum contribution to the Delta RMP in exchange for the reduced individual monitoring.

The reduced monitoring may begin in November 2015 on the condition that the City and County provide the fiscal year 2015-16 contribution to the Delta RMP by **15 January 2016**.

The City and County shall continue to adequately participate in the Delta RMP to maintain the reduced monitoring as described in Table 1 and 2. If adequate participation is not maintained, the Central Valley Water Board will require that the City and County reinstate the monitoring required by the Alternative Monitoring Plan.

If you have any questions about the Delta RMP or this approval, please contact Selina Cole at (916) 464-4683 or selina.cole@waterboards.ca.gov. If you have questions about NPDES CAS083470 monitoring requirements, please contact Elizabeth Lee at (916) 464-4787 or elizabeth.lee@waterboards.ca.gov.

Original Signed by Adam Laputz for

Pamela C. Creedon
Executive Officer

cc: Electronic copy only-
RMP Steering Committee
Karen Ashby, Larry Walker Associates, Inc.
Ba Than, City of Stockton
Brandon Nakagawa, San Joaquin County

Table 1: Approved Monitoring Reductions for Participation in the Delta RMP - Urban Discharge

MRP Section	Monitoring Locations		Alternative Monitoring Plan[1]			Approved Monitoring Reductions for Delta RMP Participation
			Constituents	Monitoring Type	Monitoring Frequency	Monitoring Frequency
III.C (Urban Discharge)	Calaveras River	CR-46	Table 1 of the MRP	Flow weighted & Grab	3 wet & 4 dry 2x every 6 years	3 wet & 4 dry 1x every 6 years
		CR-39	*E. coli*, fecal coliform, chlorpyrifos, pyrethroids, mercury, methylmercury, DO, and BOD	Grab	3 wet & 4 dry 2x every 6 years	
		CR-41				
		CR-42				
	Duck Creek	DC-65/ DC-66	Table 1 of the MRP	Flow weighted & Grab	3 wet & 4 dry 2x every 6 years	3 wet & 4 dry 1x every 6 years
		DC-69	*E. coli*, fecal coliform, chlorpyrifos, pyrethroids, mercury, methylmercury, DO, and BOD	Grab	3 wet & 4 dry 2x every 6 years	
		WK-64				
	Mosher Slough	MS-14	Table 1 of the MRP	Flow weighted & Grab	3 wet & 4 dry 2x every 6 years	3 wet & 4 dry 1x every 6 years
		MS-2D	*E. coli*, fecal coliform, chlorpyrifos, pyrethroids, mercury, and methylmercury	Grab	3 wet & 4 dry 2x every 6 years	
		MS-4D				
		MS-13				
	Smith Canal	SC-1	Table 1 of the MRP	Flow weighted & Grab	3 wet & 4 dry 2x every 6 years	3 wet & 4 dry 1x every 6 years
		SC-2D	*E. coli*, fecal coliform, chlorpyrifos, and pyrethroids	Grab	3 wet & 4 dry 2x every 6 years	
		SC-4D				
	Mormon Slough	MM-142	*E. coli*, fecal coliform, DO, and BOD	Grab	3 wet & 4 dry 2x every 6 years	3 wet & 4 dry 1x every 6 years
		MR-2D				
	Five-Mile Slough	5M-25	*E. coli*, fecal coliform, chlorpyrifos, pyrethroids, DO, and BOD			3 wet & 4 dry 1x every 6 years
		5M-26				
		5M-28				

[1]Additional details describing the monitoring locations, constituents, and sampling requirements are included in the Central Valley Water Board 4 November 2015 approval letter for the City of Stockton and County of San Joaquin's Alternative Monitoring Plan.

Table 2: Approved Monitoring Reductions for Participation in the Delta RMP - Receiving Water & Water Column and Sediment Toxicity

MRP Section	Monitoring Locations		Alternative Monitoring Plan[1]			Approved Monitoring Reductions for Delta RMP Participation
			Constituents	Monitoring Type	Monitoring Frequency	Monitoring Frequency
III.D (Receiving Water)	Calaveras River	CR-46RUS/ CR-1R (Upstream)	*E. coli*, fecal coliform, chlorpyrifos, pyrethroids, mercury, methylmercury, DO, and BOD	Grab	3 wet & 4 dry 2x every 6 years	3 wet & 4 dry 1x every 6 years
		CR-46R (Downstream)	Table 1 of the MRP			
		CR-39R (Downstream)	*E. coli*, fecal coliform, chlorpyrifos, pyrethroids, mercury, methylmercury, DO, and BOD			
		CR-41R (Downstream)				
	Duck Creek	DC-65R/ DC-66R (Downstream)	Table 1 of the MRP	Grab	3 wet & 4 dry 2x every 6 years	3 wet & 4 dry 1x every 6 years
		DC-65RUS (Upstream)	E. coli, fecal coliform, chlorpyrifos, pyrethroids, mercury, methylmercury, DO, and BO			
		WK-64R (Downstream)				
	Mosher Slough	MS-14RUS (Upstream)	*E. coli*, fecal coliform, chlorpyrifos, pyrethroids, mercury, methylmercury	Grab	3 wet & 4 dry 2x every 6 years	3 wet & 4 dry 1x every 6 years
		MS-14R (Downstream)	Table 1 of the MRP			
		NW-Rain	Total mercury and total methylmercury, chlorpyrifos, diazinon, and pyrethroids	-	3 wet, annually	No reductions
		NE-Rain	Total mercury and total methylmercury, chlorpyrifos, diazinon and pyrethroids			
		MS-2R (Downstream)	*E. coli*, fecal coliform, chlorpyrifos, pyrethroids, mercury, and methylmercury	Grab	3 wet & 4 dry 2x every 6 years	3 wet & 4 dry 1x every 6 years
	Smith Canal	SC-1R (Downstream)	Table 1 of the MRP	Grab	3 wet & 4 dry 2x every 6 years	3 wet & 4 dry 1x every 6 years
		SC-2R (Downstream)	*E. coli*, fecal coliform, chlorpyrifos, and pyrethroids			
		SC-4R (Downstream)				

MRP Section	Monitoring Locations		Alternative Monitoring Plan[1]			Approved Monitoring Reductions for Delta RMP Participation
			Constituents	Monitoring Type	Monitoring Frequency	Monitoring Frequency
III.D (Receiving Water)	Smith Canal	SC-Rain	Total mercury and total methylmercury, chlorpyrifos, and pyrethroids	-	3 wet, annually	No reduction
	Mormon Slough	MR-2R	*E. coli*, fecal coliform, DO, and BOD	Grab	3 wet & 4 dry 2x every 6 years	3 wet & 4 dry 1x every 6 years
		MR-4R				
	Five-Mile Slough	5M-25R	*E. coli*, fecal coliform, chlorpyrifos, pyrethroids, DO, and BOD	Grab	3 wet & 4 dry 2x every 6 years	3 wet & 4 dry 1x every 6 years
		5M-26R				
		5M-28R				
III.E (Water Column Toxicity)	Calaveras River	CR-46R (Downstream)	Water Column Toxicity	Grab	1 wet & 1 dry 2x every 6 years	1 wet & 1 dry 1x every 6 years
	Duck Creek	DC-65R/ DC-66R (Downstream)				
	Mosher Slough	MS-14R (Downstream)				
	Smith Canal	SC-1R (Downstream)				
III.G (Sediment Toxicity)	Calaveras River	CR-46R	Sediment Toxicity	-	1 wet & 2 dry 2x every 6 years	1 wet & 2 dry 1x every 6 years
	Duck Creek	WK-64R				
	Mosher Slough	MS-14R				
	Smith Canal	SC-5R				

[1]Additional details describing the monitoring locations, constituents, and sampling requirements are included in the Central Valley Water Board 4 November 2015 approval letter for the City of Stockton and County of San Joaquin's Alternative Monitoring Plan.

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Sacramento-San Joaquin Delta Regional Monitoring Program Annual Report For MS4 Reporting

Fiscal Year 2022-2023

September 25, 2023

Prepared By:

MLJ ENVIRONMENTAL

TABLE OF CONTENTS

LIST OF TABLES

FISCAL YEAR 2022-2023 MONITORING PROJECTS

MERCURY

The information collected as part of the Delta RMP mercury monitoring sector is critical to implementing the Delta MeHg Total Maximum Daily Load (TMDL), providing calibration and validation data for a Department of Water Resources (DWR) mercury model, and informing other management and regulatory decisions related to water quality improvement and ecosystem restoration in the Delta. This monitoring has provided essential evidence for regulators implementing the TMDL and contributes to ongoing analytical work by DWR. The DWR model was used to guide regulations and operational decisions related to farming, flood control, and wetland management. Central Valley Water Board staff used these data to inform the 2020 Delta Mercury Control program including Phase 2 potential modifications and options.

Annual sport fish sampling started in August 2016 and has been ongoing. The indicator of primary interest is total mercury in muscle fillet of 350-mm largemouth bass (or similar predator species). Total mercury is a close surrogate for the element's more toxic form, MeHg. The locations of the trend sites for black bass collection represent different subareas of the Delta and are co-located with the water monitoring sites. Sport fish monitoring occurred in August 2021 at seven core locations and five restoration locations. Water sampling was conducted during four events (August 2021, March 2022, April 2022, and August 2022) at seven sites that align with sport fish monitoring sites. Indicators of primary interest are concentrations of methylmercury and total mercury in water. Important ancillary parameters include chlorophyll-a, dissolved organic carbon (DOC), suspended sediment concentrations, total suspended solids (TSS), and volatile suspended solids (VSS).

Additional mercury monitoring of fish and water took place in August and September 2022. This monitoring was added as an amendment to the Delta RMP QAPP (v7.1) on July 7, 2022, based on a recommendation from the Steering Committee on March 21, 2022, to include one additional fish and water monitoring event prior to pausing monitoring as part of the long-term planning process.

It was agreed during the December 14, 2021 Delta RMP Steering Committee meeting that mercury monitoring should go into a long-term planning stage after fiscal year 2021-2022 (FY 21-22). Though the mercury monitoring was previously conducted on a fiscal year basis to coincide with the budget cycle, the overarching study design was done in a way to connect the spring water collections to a fall fish monitoring event. Therefore, it was suggested that a single additional fish and water monitoring event be conducted in the fall of 2022 as part of the FY 21-22 monitoring. At the March 21, 2022 meeting, the Steering Committee recommended an additional fall monitoring event be added to the FY 21-22 version of Delta Regional Monitoring Program (Delta RMP) Quality Assurance Project Plan (QAPP) (version 7.0) as part of year seven of the mercury monitoring project evaluating

mercury cycling in Delta water and update of methylmercury (MeHg) into fish.

The rationale for the additional fall event included:

1. Completing the water dataset for 2022 (able to compare spring to fall mercury concentrations)
2. Completing the paired water:fish data set for 2022 (able to compare spring mercury concentrations to the fall fish mercury concentrations)
3. Evaluating the effect of this unusual water year
4. Value in annual sampling for evaluation drivers of interannual trends, especially with the potential for a lagged response
5. Further establishing bass baselines at restoration stations.

The monitoring occurred under a contract between Moss Landing Marine Laboratories (MLML) and the State Board using Surface Water Ambient Monitoring Program (SWAMP) funds which were allocated to the Central Valley Regional Water Quality Control Board.

Mercury Monitoring Summary

1. **Subregional trends in bass** – Annual monitoring of methylmercury in black bass ("black bass" includes largemouth, smallmouth, and spotted bass) continued at seven stations (distributed among the TMDL subregions). The black bass fish monitoring will firmly establish baseline concentrations and interannual variation in support of monitoring of long-term trends as a critical performance measure for the TMDL. Fish collection for FY 22-23 occurred in September 2022. During the September 2022 event, fish tissue was collected at four of the seven sites. No fish were collected at Cache Slough at Liberty Island Mouth or Sacramento River at Mallard Island/Sherman Island because of restrictions to the fish collection permit where electrofishing was not allowed. Hook and line fishing at this site in the previous year was not productive and the decision was made to drop the sites for fish collection. Fish were not collected at San Joaquin River at Vernalis/Airport because the low water made it impossible to launch an electrofishing boat and unsafe for field crew to use a smaller Jon boat with portable electrofishing unit.
2. **Subregional trends in water** – Monitoring of MeHg in water at seven stations occurred during one sampling event in August 2022. These data will extend the time series information with a low-cost approach for time periods that are representative of conditions in high-flow (March and April) and low-flow (August) regimes and that link to concentrations in prey fish and black bass. These data may also be valuable in verifying trends and patterns predicted by numerical models of methylmercury transport and cycling being developed for the Delta and Yolo Bypass by DWR. These models may allow testing of various land and water management scenarios.
3. **Restoration monitoring** – Annual monitoring of methylmercury in black bass and was scheduled to occur at four stations for black bass located near habitat restoration projects. This element was added in FY 19-20. The original details of the

design for the restoration monitoring (five station locations, mix of black bass and prey fish stations) had been determined with input from restoration managers and Delta RMP Technical Advisory Committee members. However, prey fish monitoring was not included since FY 21-22 mercury monitoring due to Delta smelt concerns and sensitive habitat permit restrictions. For FY 22-23, samplers were again required to do hook and line sampling for one of the black bass restoration monitoring sites (Yolo Flyway). There was a second site (Lookout Slough) where electrofishing was not permitted. Hook and line fishing was not successful at this site the previous year. As a result, there was a decision not to sample for bass at Lookout Slough.

Fish and water monitoring for mercury is on pause while the Delta RMP focusing on long-term planning.

Mercury Monitoring Data and Reporting

There are three years of mercury data with no written report associated with the data. At the December 15, 2022 SC meeting, a Mercury Subgroup was created to provide a recommendation to the SC regarding a mercury report that will be written by San Francisco Estuary Institute – Aquatic Sciences Center (SFEI-ASC) under contract with Surface Water Ambient Monitoring Program (SWAMP) funds. The Mercury Subgroup provided suggestions on what should be included in a mercury report. The suggestions were presented at the April 10, 2023 Steering Committee which focused on the main audience of the report, report objectives, years of data to include, management questions to address, as well as report deliverables including any specific tasks (e.g. presentations). The goal is to have the Mercury Interpretive Report completed in FY 23-24.

NUTRIENT STUDIES

Sacramento River Nutrient Change Study (SRiNCS)

Sampling for the Sacramento River Nutrient Change Study (SRiNCS) Phase 1: Effluent Valve Replacement Hold was conducted in September 2019. This study was a collaborative effort between Regional San, Applied Marine Sciences, United States Geological Study (USGS), and San Francisco State University. This study tracked the effects of changes in nutrient loading resulting from a short-term wastewater hold at the Sacramento River Wastewater Treatment Plant (SRWTP). In the summer of 2019, scheduled wastewater effluent holds occurred during the Effluent Valve Replacement (EVR) project, part of the EchoWater upgrade at the SRWTP. During an EVR hold, no treated effluent entered the Sacramento River for a period of up to 48 hours. Based on prior USGS research, this was expected to create a parcel of effluent-free river water over six miles long in the Sacramento River. The impacts of short-term changes in nutrient loading were tracked in parcels of water with and without effluent during movement downstream in the Sacramento River and nearby channels.

The project consisted of a one week-long river sampling campaign, field measurements,

laboratory analyses, numeric modeling, and reporting. The project used multiple methods, including boat-mounted, high frequency monitoring of nutrients and fluorescence; discrete sampling for analyses of water quality, phytoplankton and zooplankton abundances, clam biomass, and phytoplankton carbon uptake (to determine growth rates). Data and hydrodynamic modeling were used to evaluate the response of phytoplankton to a range of nutrient loads and forms, as well as factors of light, turbidity, water residence time, and grazing by zooplankton and clams. A modeling report by RMA (standalone deliverable for the SRiNCS project) was distributed to the Delta RMP Nutrients Subcommittee for review in 2020. A draft report of the SRiNCS project was provided to the Nutrient TAC on March 28, 2022. After initial TAC review concluded on June 17, 2022, the report underwent an internal USGS review. The report was brought back to the Nutrient TAC on May 11, 2023 where it was recommended by the TAC for approval. The Steering Committee voted by email to recommend the SRiNCS report (voting ended July 16, 2023) and the report was approved by the DRMP Executive Committee on July 27, 2023.

The final report is available via the Delta RMP website (https://deltarmp.org/Documents/Sacramento_River_Nutrient_Change_Study.pdf).

Microcystis Study

Cyanobacteria harmful algal blooms (CHABs) are a rising ecological issue in the Delta. Some locations are more prone to CHABs, but it is unclear where CHABs originate. The Source Tracking of Cyanobacteria Blooms in the Sacramento-San Joaquin Delta (also referred to as the Microcystis Study) is focused on the knowledge gap of understanding where blooms of the common CHAB genus, *Microcystis*, originate in the Delta. The project's primary hypothesis is that there are specific areas, where flows and tidal velocity are low, that contain high concentrations of benthic resting cells (*Microcystis* cells that overwinter at the sediment surface). These benthic resting cells ultimately recruit to the water column, grow into blooms at sites of overwintering, and are transported elsewhere in the Delta. It is also hypothesized that areas where CHABs are frequently observed and have higher flows and tidal velocities have relatively low-to-no benthic resting populations due to physical export from the system. This project was approved by the Delta RMP in August 2020 and was funded using Supplemental Environmental Project (SEP) funds obtained by the Regional Board as a result of enforcement actions.

The project began in November 2020. Water samples were collected during four events at 8 sites and sediment was collected during four events at 7-8 sites depending on the event. During November 2020, there were issues collecting samples from the Clifton Forebay and San Joaquin River at Vernalis location. See **Table 1** for a list of sample dates.

Table 1. Microcystis study sampling dates.

Event	Day 1	Day 2	Day 3	Day 4	Water	Sed	Sampling Notes
End of CHAB season	11/10/20	11/18/20	11/19/20	12/4/20	---	X	7 sites; Unable to collect at Clifton Forebay and Vernalis.
Very beginning of CHAB season	4/28/21	4/30/21	5/5/21	5/6/21	---	X	8 sites; unable to collect at Vernalis
CHAB season (1)	6/4/21	6/7/21	6/9/21	---	X	X	8 sites
CHAB season (2)	6/29/21	6/30/21	7/2/21	---	X	X	8 sites
CHAB season (3)	7/14/21	7/15/21	---	---	X	---	8 sites
CHAB season (4)	8/4/21	8/6/21	---	---	X	---	8 sites

Molecular tools were used to analyze the samples including qPCR to quantify Microcystis and metagenomic sequencing of c-phycocyanin genes specific to cyanobacteria to develop unique genetic signatures or "fingerprints" of Microcystis assemblages in water and sediment samples. Microcystis source-tracking will be accomplished by comparing local sediment and water column abundances and strain profiles with adjacent sites across temporally relevant distances. Each molecular fingerprint indicates the proportions of different strains of Microcystis in sediment and water and changes in proportions of strains over time and space. Abundances of Microcystis resting cells and genetic characteristics of Microcystis in the water column and sediment were used to test hypothesis about bloom origins. This work may ultimately be useful for identifying locations for implementation of focused CHAB management measures. Additional (non-Delta RMP) funding was secured to do a Phase II of the project. Sampling was conducted in November 2021 and April 2022 for Phase II.

Dr. Ellen Preece, project lead, presented on the results from the study at the September 22, 2021, Delta RMP TAC. The Phase I final report was submitted to the Regional Board and the Delta RMP on December 31, 2021. The report was reviewed by the Nutrient TAC on February 25, 2022. The Nutrient TAC preferred to wait until Phase II is complete before recommending the final report to be made available on the website. It is anticipated the final publication including findings from Phase II will be ready by the end of FY 23-24.

USGS/DWR Cyanobacteria Study

The Delta RMP agreed to contribute funds to the following USGS / DWR monitoring effort, "Cyanotoxin Monitoring in the Delta: Leveraging existing USGS and DWR field efforts to identify cyanotoxin occurrence, duration and drivers" which included additional funds for the deployment of an additional instrument that monitors phytoplankton taxonomy

continuously (bbe Fluoroprobe) at the Middle River station.

The study originally proposed to collect cyanotoxin data year-round (fall 2020 to fall 2021) from four stations in the Delta to enhance existing monitoring programs for flow, nutrients, water quality and phytoplankton, including harmful algal blooms (HABs). Monitoring at two additional stations was funded by internal USGS funds. Due to COVID-19 restrictions, sampling did not begin until March 2021. The Delta RMP agreed to continue contributing funds in 2022 for an additional 12 months from March 2022 until March 2023 for monitoring at the Middle River location (MDM) outlined in an amendment to the FY 21-22 Workplan (approved by the BOD on January 24, 2022). Monitoring at the other five sites will continue with Proposition 1 funding. Data are available through the USGS tableau site which includes visualizations of spatial and temporal trends.

The monitoring at MDM project includes measuring the presence of cyanotoxins with Solid Phase Adsorption Toxin Tracking (SPATT) samplers and with discrete whole water sample collection. The MDM station measures flow and is equipped with YSI EXOs (water temperature, specific conductance, turbidity, pH, dissolved oxygen, chlorophyll-a/BGA), a SUNA nitrate analyzer, and a bbe Fluoroprobe.

The data will help identify linkages between environmental drivers (nutrients, flow, temperature) on HAB formation and cyanotoxin production, and can be used by managers and modelers to inform the design of future monitoring programs and to develop predictive models. Findings will be presented at local conferences (e.g., Bay Delta, IEP) and presented to the Delta RMP upon request. USGS is developing a status and trend report that describes the approach and methods, summarizes any issues or lessons learned that occurred during data collection, provides tabular and/or graphical summaries of the spatial and temporal patterns in the data, evaluates the data quality, and relates study findings to the Delta RMP management questions. The report will also include comparison between the whole water and SPATT data and between the LCMS-MS and ELISA data. The final data report is expected in FY 23-24.

Long Term Planning

The Delta RMP has been conducting long-term planning for nutrients which includes Harmful Algal Blooms (HABs). A Nutrient Symposium was held on September 27, 2022. The Symposium had the following goals:

1. Informing upcoming Delta RMP long-term nutrient planning efforts,
2. Informing Delta RMP stakeholders on recent nutrient activities in the Delta including an assessment of data gaps and an evaluation of management questions, and
3. Improving understanding of management activities associated with water quality problems identified in the Delta Nutrient Research Plan.

The Nutrient TAC developed a Nutrient Symposium report out with the key takeaways from the symposium. The report out included a summary of Delta RMP funded research

(what do we know?), data gaps (what do we need to know about nutrients in the Delta?), and next steps (what can we get in the next 3-5 years from the research, special studies, and/or modeling?). As part of the summary of next steps, a table of 19 study questions was created associating Core Management and Assessment questions to more specific study questions with research methods and information gained. The Steering Committee discussed the key takeaways from Nutrient Symposium on November 30, 2022 with follow-up discussion on December 15, 2022. Based on the feedback from the Steering Committee regarding priorities, the Nutrient TAC narrowed down the 19 potential study questions into two study plan questions. A third study plan question was added based on continued discussion at the Joint Steering Committee and Nutrient TAC meeting held on March 16, 2023.

The Nutrient Study Plan questions revolve around three priority focus areas: 1) management of nutrient concentrations, 2) understanding the ecological effects of nutrient reductions, and 3) status and trends of harmful cyanobacteria blooms with a primary question under each priority area. The primary questions have been adjusted based on feedback from the Steering Committee and are associated with options for research methods and tied to information gained. The specifics associated with each focus area are still being developed as part of the multi-year Nutrient Study Plan development process; the language associated with the research method and information gained for each focus area may be adjusted during this process.

Focus Area 1: Capability to Predict Nutrient Concentrations

Primary Question: Following a reduction in nutrient loading from different point and non-point sources, what ranges of nutrient concentrations are expected to occur throughout the Delta, and how might they be affected by climate change, wetland restorations, and water management and routing?

Research Method: Use a hydrodynamic biogeochemical model to estimate N and P concentrations (and their ratios) in different regions of the Delta under multiple nutrient management scenarios. Evaluate how differing river discharges (precipitation and reservoir releases), and water management operations (export pumping, Delta Cross Channel Gate closures, and Suisun Marsh Salinity Control Gates tidal closures), might affect nutrient concentrations (N and P, and their ratios) throughout different regions of the Delta. Create maps of predicted ranges in nutrient concentrations under reduced nutrient loading from river inflows and potentially internal sources.

Information Gained: Modeling the level of nutrient reduction that could be achieved by reducing nutrient loading from river tributaries would help identify the minimum feasible nutrient concentrations in the Delta and quantify the effort required to establish and maintain low nutrient concentrations.

Reductions in nutrient loading from different sources would have differing effects throughout the Delta, due to hydrodynamics and biogeochemical processes. Therefore, it is helpful to model how reductions in nutrient loading from particular sources, or a

combination of sources, could affect nutrient concentrations in specific regions of interest (such as regions where Harmful Algal Blooms (HABs) are common). It is also important to understand how changes in water operations can change water flows and possibly the distribution of nutrient concentrations and biogeochemical processing.

Focus Area 2: Understanding the Ecological Effects of Nutrient Reductions

Primary Question: What are the thresholds for nutrients (N and P and their ratios) that can limit HAB biomass and cyanotoxin accumulation to safe levels, limit the abundance and distribution of nuisance macrophytes, and support robust growth of desirable phytoplankton and macrophytes throughout the Delta?

Research Method: Many research options could inform this question.
Perform a literature review of previous research investigating reductions of nitrogen, phosphate, and the N:P ratio in controlling the growth, biomass, and distribution of harmful cyanobacteria, nuisance aquatic plants, and beneficial phytoplankton. What phytoplankton and aquatic plant species inhabit other estuaries following significant nutrient reductions? At low nutrient concentrations, would phytoplankton and aquatic plant growth be affected differently by water temperature, turbidity, water depth, tidal flows, stratification, nutrient cycling, and invertebrate grazing?

Testing nutrient thresholds for cyanobacteria, phytoplankton, taste and odor, and aquatic plant growth and biomass in replicated mesocosms. Methods to reduce initial nutrient concentrations might include diluting Delta surface water with low nutrient (filtered) water and adding back nutrients and major ions to experimental concentrations, creating laboratory culture water at specific nutrient concentrations, or allowing biological nutrient drawdown to occur before starting experiments to test low nutrient loading. Many important factors need to be controlled and potentially used as variables in mesocosm experiments, such as initial nutrient concentrations, nutrient loading rates, light levels, temperature, water mixing, sediment volume and properties, DO, pH, salinity, POC, starting species composition and biomass (pelagic, epiphytic, and periphytic phytoplankton and cyanobacteria and aquatic plants), species and biomass of invertebrate grazers, river conditions occurring prior to sample collection, experimental duration, and sampling frequency.

Trends in growth and biomass of phytoplankton, cyanobacteria, and aquatic plant communities can be monitored along nutrient gradients in the Delta that decline to low levels, such as those occurring in terminal sloughs. Monitoring studies should collect data on factors affecting phytoplankton growth, such as water velocity and mixing, water depth and light, turbidity, salinity, pH, DO, invertebrate grazing pressure, aquatic weed control programs, connectivity to other waterways, and local nutrient inputs (groundwater and island discharge).

Information Gained: Nutrient concentrations in most major Delta channels were replete during past studies, so ecological responses to low nutrient concentrations in the Delta are

not well understood. The reduction of concentration and loading rate of nutrients necessary to prevent cyanobacteria and aquatic plants from growing to harmful concentrations in the Delta has not been determined. Correlations between HABs and nutrient concentrations are of limited use because cyanobacteria populations may persist by recycling nutrients when concentrations are low and HABs do not form in all regions of the Delta where nutrient concentrations are high, likely due to suppression by other physical or biological factors. A literature review would be informative but should be focused on the outcomes of nutrient reduction programs in other estuaries, as lakes and rivers that are naturally oligotrophic are unlikely to represent the processes occurring in managed and highly urbanized estuary systems.

Mesocosm experiments that control nutrient concentrations and other physical factors can be useful in evaluating phytoplankton and aquatic plant growth and other ecological interactions at low nutrient concentrations. These experiments can be initiated with water samples collected from the Delta to help identify species that are competitively dominant at low nutrient concentrations (N, P, or their ratios). Mesocosms can also be used to estimate the biomass of desirable phytoplankton produced at low nutrient concentrations and/or other scenarios that may not currently occur.

Some terminal channels in the Delta have been shown to have gradients in nutrient concentrations, with low concentrations present at their distal ends. Monitoring phytoplankton species occurring at different nutrient concentrations within these sloughs may help identify species expected to occur elsewhere at reduced nutrient loads. However, due to the lack of tidal flows through the distal end of these habitats, they might be dominated by phytoplankton that inhabit lentic (non-flowing) waters, which would not represent the majority of the Delta.

Focus Area 3: Status and Trends of Harmful Cyanobacteria Blooms

Primary Question: How are the characteristics of harmful cyanobacteria blooms and cyanotoxins in the Delta changing (e.g., species, magnitude, geographic extent, and timing) and what factors contribute to these changes?

Research Method: Monitor cyanobacteria blooms and toxins by collaborating with or augmenting other data collection efforts or funding future Supplemental Environmental Project (SEP) studies. Leveraging Delta RMP funds by collaborating with other efforts is important to expand the scope of information that will be gained. Likely methods include collecting water and/or passive sampler media for analyses of cyanotoxins. Other analytes (water samples) could include chlorophyll-a, phytoplankton community composition, and genetic analyses for cyanotoxin production potential. Ideally, factors potentially affecting HAB blooms should be measured concurrently during sample collection or obtained in parallel, such as water temperature, salinity, depth, light availability, turbidity, water column mixing and flows, dissolved oxygen, pH, and nutrient concentrations.

Information Gained: Data to better understand changes in cyanobacteria status and risks in the Delta. There is no comprehensive monitoring of cyanotoxins currently in place in the

Delta. The Delta RMP has effectively contributed to HABs science by adding funding or sites to studies led by others (e.g., passive sampler media deployment by USGS).

The Nutrient TAC is working to develop a Multi-year Nutrient Study Plan by the end of 2023.

PESTICIDES AND TOXICITY MULTI-YEAR STUDY

Water Year 2023 (WY 2023, Oct 1, 2022 – Sept 30, 2023) was Year 3 of a multi-year Current Use Pesticides (CUP) study design focused on monitoring of pesticides and toxicity in the Sacramento-San Joaquin Delta. The multi-year CUP study design includes a rotating basin monitoring design with monitoring at two fixed sites which began in October 2018. The study design originally included a 4-year monitoring program covering six Delta sub-regions after which an interpretive report will inform adaptive management and improve future monitoring. Due to various delays in monitoring, the 4-year monitoring design will take six years to complete and is planned to be completed in September 2024.

The Delta RMP drafted a new QAPP for Year 3 and Year 4 to meet the new Resolution requirements and utilize the DRMP QAPP template. The CUP QAPP was submitted on June 1, 2022, and comments from Regional Board were received on June 24 and July 5, 2022. A revised version of the CUP QAPP (v1.1) was submitted on August 15, 2022, to address comments received from the Regional Board and State Water Board Quality Assurance Officer (QAO). A temporary conditional approval was granted on October 13, 2022, to allow data collection for the project and required approval of a revised QAPP by November 18, 2022 in order for data collection to continue past that date. A second revision of the CUP QAPP (v1.2) was submitted on October 25, 2022. A response was provided to the DRMP on November 18, 2022 indicating that the revised CUP QAPP did not address all of the concerns; therefore, monitoring was halted. After meeting with Regional and State Water Board staff, revised language was submitted and the QAPP was approved on December 22, 2022. The final version of the CUP QAPP (v1.3) was submitted for signatures on January 13, 2023. All signatures were received on March 13, 2023.

Four of the six monitoring events for Year 3 (WY 2023) took place during FY 22-23. The remaining two events took place in FY 23-24. Samples collected in WY 2023 were analyzed for a suite of 178 pesticides by the USGS Organic Chemistry Research Laboratory (OCRL). Compounds include fungicides, herbicides, insecticides, and their degradation products. In addition, crews measure field parameters (water temperature, pH, conductivity, dissolved oxygen, turbidity), and document conditions at the field site. Babcock analyzes samples for copper and ancillary parameters (total nitrogen, total particulate carbon, particulate organic carbon, and dissolved organic carbon).

Pacific EcoRisk tests water samples for toxicity to a suite of test organisms based on current Environmental Protection Agency (EPA) and SWAMP methods:

- *Ceriodaphnia dubia*, a daphnid or water flea (survival, reproduction) – sensitive to

organophosphate pesticides
- *Hyalella azteca*¸ an aquatic invertebrate (survival) – sensitive to pyrethroids
- *Selenastrum capricornutum* (also known as *Raphidocelis subcapitata*), a single-celled algae (growth) – sensitive to herbicides
- *Chironomus dilutes*, midge larvae (formerly *Chironomus tentans*) – sensitive to fipronil and more sensitive in chronic exposures to imidacloprid than *C. dubia*.
- *Pimephales promelas* (growth, survival) – chronic and acute effects on whole organism growth and survival

A Toxicity Identification Evaluation (TIE) Advisory Committee (previously a TIE Subcommittee) is tasked with the responsibility of rapidly deciding, on a case-by-case basis, whether and how to allocate resources to conduct TIEs for samples exceeding a toxicity threshold (≥50% reduction in organism response relative to the lab control) and whether to conduct any follow-up analyses (e.g., additional TIE treatments, supporting analytical chemistry) with a sample where results may not clearly indicate a pesticide or class of contaminants causing toxicity. There was one sample with a TIE performed during the WY 2023 during Event 2.

The data from WY 2023 will be evaluated in a CUP Data Report in 2024 after all final data have been received. Data will be made available on the California Environmental Data Exchange Network (CEDEN) within 6 months from the final sampling event of WY 2023.

CONTAMINANTS OF EMERGING CONCERN

During FY 20-21, the Delta RMP initiated the July 2018 Central Valley Pilot Study for Monitoring Constituents of Emerging Concern (CECs) Work Plan. Sample collection for CEC Year 1 began in September 2020. All Year 1 data were transferred to CEDEN on November 19, 2021.

Year 2 monitoring began in August 2021 and was completed in June 2022. Monitoring consisted of water samples (9 sites), sediment samples (3 sites), fish (4 sites), and clams (6 sites). Monitoring occurred in October 2021 (storm event), January 2022 (first flush event), March 2022 (storm event), April 2022 (dry event) and June (dry event).

All Year 2 data were received by August 19, 2022, and were provided to the Regional Board and CEC TAC. The draft CEC Year 2 Data Report was provided to the TAC on October 11, 2022, for discussion at the October 18, 2022 TAC meeting. The second draft was provided on October 24, 2022. On November 17, 2022, the TAC met and recommended the CEC Year 2 Data Report to the Steering Committee and approved transfer of the data to the CEDEN. The Year 2 CEC data were available on CEDEN as of December 5, 2022. The Steering Committee recommended the report for approval by the BOD on December 15, 2022, and the BOD approved the report on December 19, 2022.

During FY 22-23, the CEC Year 3 Study design was reviewed and recommended for

approval by the CEC TAC. The first draft of the CEC Year 3 study design was provided to the CEC TAC on November 22, 2022 for discussion at the December 12, 2022 TAC meeting. A second draft was provided on January 5, 2023 for review at the January 23, 2023 TAC meeting. At the January 23, 2023 TAC meeting, the CEC TAC recommended to the CEC Year 3 Study design. The Year 3 Study design was reviewed by the Steering Committee at the February 16, 2023 and April 10, 2023 Steering Committee meetings. Steering Committee edits were integrated into the study design included in the FY 23-24 Monitoring Workplan submitted to the Regional Board on May 1, 2023. The Executive Committee approved the CEC Year 3 Study design as part of the FY 23-24 Monitoring Workplan on April 24, 2023, and was submitted on May 1, 2023. Comments on the FY 23-24 Monitoring Workplan were received from Regional Board on July 3, 2023, and a revised Monitoring Workplan was submitted on September 8, 2023.

A QAPP for the Year 3 CEC study plan was developed and submitted on May 1, 2023 (CEC QAPP v3.0). The CEC QAPP was recommended by the CEC TAC on April 21, 2023. The Executive Committee approved the QAPP on April 24, 2023, and the document was submitted May 1, 2023. Comments from Regional and State Water Boards were received by June 15, 2023. A revised CEC QAPP (CEC QAPP v3.1) was submitted on July 15, 2023. A planning scouting trip in August led to an adjustment of some monitoring site locations. Those changes as well as additional comments from the water boards were incorporated and resubmitted as CEC QAPP v3.2. A third resubmittal (CEC QAPP v3.3) was submitted for signatures the week of September 11th. It is anticipated that Year 3 sampling will occur in September and October 2023.

DELTA RMP WATER QUALITY MONITORING DATA

Delta RMP CEDEN project names and codes are listed in **Table 2**. Final monitoring data will be publicly available in CEDEN after being recommended for approval by the relevant Delta RMP TAC. Provisional data are made available to regulatory staff prior to finalization and synching with CEDEN. Please note that the toxicity and copper data are grouped with the pesticide data and use the same project code. Pesticide data are also available in the USGS National Water Information System (NWIS).

For more information on Delta RMP studies, including final reports, please visit: https://deltarmp.org/.

Table 2. Publicly available datasets on CEDEN under the Program Code Delta RMP.

Parent Project Name	Parent Project Code	Project Name	Project Code	Agency	Sample Period	Status
Delta RMP – Current Use Pesticides [1]	DRMP_CUP	2022 Delta RMP Current Use Pesticides	22DRMP5CUP	USGS	10/1/2022 – 9/30/2023	Data are being reviewed and loaded into the CV RDC and will be uploaded to CEDEN after final review.
		2020 Delta RMP Current Use Pesticides	20DRMP5CUP	USGS	10/1/2020 – 9/30/2021	Available on CEDEN.
		2019 Delta RMP Current Use Pesticides	19DRMP5CUP	USGS	10/1/2019 – 9/30/2020	Available on CEDEN.
		2018 Delta RMP Current Use Pesticides	18DRMP5CUP	USGS	10/1/2018 – 9/30/2019	Available on CEDEN.
		2016 Delta RMP Current Use Pesticides	16DRMP5CUP	USGS	7/1/2016 – 6/30/2017	Available on CEDEN.
		2015 Delta RMP Current Use Pesticides	15DRMP5CUP	USGS	7/1/2015 – 6/30/2016	Available on CEDEN.
Delta RMP - Constituents of Emerging Concern	DRMP_CEC	2023 Delta RMP Constituents of Emerging Concern	23DRMP5CEC	MLJ	7/1/2023 – 6/30/2024	Data will be reviewed and loaded into the CV RDC and will be uploaded to CEDEN after final review.

Parent Project Name	Parent Project Code	Project Name	Project Code	Agency	Sample Period	Status
		2021 Delta RMP Constituents of Emerging Concern	21DRMP5CEC	MLJ	7/1/2021 – 6/30/2022	Available on CEDEN.
		2020 Delta RMP Constituents of Emerging Concern	20DRMP5CEC	SFEI	7/1/2020 – 6/30/2021	Available on CEDEN.
Delta RMP - Mercury	DRMP_Hg	2022 Delta RMP Mercury	22DRMP5Hg	MPSL-DFW	8/22/2022-6/30/2023	Available on CEDEN. [2]
		2022 Delta RMP Wetland Restoration Fish Mercury	21DRMP5Rest	MPSL-DFW	8/22/2022-6/30/2023	Available on CEDEN. [2]
		2021 Delta RMP Mercury	21DRMP5Hg	MPSL-DFW	7/1/2021 – 6/30/2022	Available on CEDEN. [2]
		2021 Delta RMP Wetland Restoration Fish Mercury	21DRMP5Rest	MPSL-DFW	7/1/2021 – 6/30/2022	Available on CEDEN. [2]
		2020 Delta RMP Mercury	20DRMP5Hg	MPSL-DFW	7/1/2020 – 6/30/2021	Available on CEDEN.
		2019 Delta RMP Mercury	19DRMP5Hg	MPSL-DFW	7/1/2019 – 6/30/2020	Available on CEDEN.
		2018 Delta RMP Mercury	18DRMP5Hg	MPSL-DFW	7/1/2018 – 6/30/2019	Available on CEDEN.
		2017 Delta RMP Mercury	17DRMP5Hg	MPSL-DFW	7/1/2017 – 6/30/2018	Available on CEDEN.

Parent Project Name	Parent Project Code	Project Name	Project Code	Agency	Sample Period	Status
		2016 Delta RMP Mercury	16DRMP5Hg	MPSL-DFW	7/1/2016 – 6/30/2017	Available on CEDEN.
Delta RMP - Pathogens	DRMP_PAT	2016 Delta RMP Pathogens	16DRMP5PAT	SFEI	4/1/2016 – 3/31/2017	Available on CEDEN.
		2015 Delta RMP Pathogens	15DRMP5PAT	SFEI	4/1/2015 – 3/31/2016	Available on CEDEN.

[1] The Current Use Pesticides Parent Project Code includes data for pesticides, aquatic toxicity, copper, and ancillary parameters.
[2] State Board staff are working to resolve a technical issue with CEDEN and data are expected to be available in October 2023.
USGS= United States Geological Survey
MLJ= MLJ Environmental
SFEI= San Francisco Estuary Institute
MPSL-DFW= Marine Pollution Studies Laboratory- Department of Fish and Wildlife

DELTA RMP PARTICIPANTS

Delta RMP is an innovate collaboration of regulatory agencies, resources agencies, permittees, scientists, and interested parties. The list of Delta RMP participants is included in **Table 3** (does not include regulatory agencies).

Table 3. List of DRMP Participants for FY 22-23 (not including regulatory agencies).

GROUP	PARTICIPANT
Agriculture	East San Joaquin Water Quality Coalition
Agriculture	Sacramento Valley Water Quality Coalition
Agriculture	San Joaquin County and Delta Water Quality Coalition
Agriculture	Westside San Joaquin River Watershed Coalition
Dredgers	Port of Stockton
Dredgers	Port of West Sacramento
Dredgers	Sacramento Yacht Club
Flood control and habitat restoration	California Department of Water Resources
POTW	City of Brentwood
POTW	City of Davis Wastewater Treatment Facility
POTW	City of Lodi White Slough Wastewater Treatment Facility
POTW	City of Manteca Wastewater Quality Control Facility
POTW	City of Rio Vista, Beach Wastewater Treatment Facility
POTW	City of Rio Vista, Northwest Wastewater Treatment Facility
POTW	City of Sacramento Department of Utilities
POTW	City of Stockton, Regional Wastewater Control Facility
POTW	City of Tracy, Wastewater Treatment Facility
POTW	City of Vacaville
POTW	City of Woodland Wastewater Treatment Facility
POTW	Ironhouse Sanitary District
POTW	Mountain House Community Services District
POTW	Sacramento Regional County Sanitation District
POTW	Town of Discovery Bay
Stormwater	CalTrans
Stormwater	City of Ceres
Stormwater	City of Davis
Stormwater	City of Hughson
Stormwater	City of Lathrop
Stormwater	City of Lodi

GROUP	PARTICIPANT
Stormwater	City of Manteca
Stormwater	City of Modesto Utilities Department
Stormwater	City of Oakdale
Stormwater	City of Patterson
Stormwater	City of Rio Vista Public Works Department
Stormwater	City of Ripon
Stormwater	City of Riverbank
Stormwater	City of Rocklin Public Services Department
Stormwater	City of Stockton & San Joaquin County
Stormwater	City of Tracy
Stormwater	City of Turlock
Stormwater	City of Vacaville
Stormwater	City of West Sacramento
Stormwater	City of Woodland
Stormwater	Colusa County
Stormwater	County of El Dorado
Stormwater	Sacramento County Department of Water Resources
Stormwater	San Joaquin County Public Works Department
Stormwater	Stanislaus County Department of Public Works
Stormwater	Sutter County Development Services Department, Public Works
Stormwater	Yolo County Planning and Public Works Department
Stormwater	Yuba County Public Works Department

APPENDIX E

Pyrethroid Management Plan Annual Progress Report

Pyrethroid Management Plan Annual Progress Report

1. INTRODUCTION

On June 8, 2017, the Central Valley Regional Water Quality Control Board (Regional Water Board) adopted Resolution R5-2017-0057, the Basin Plan Amendment (BPA) for the Control of Pyrethroid Pesticide Discharges.[1] The BPA was subsequently approved by the State Water Resources Control Board on July 10, 2018 and the Office of Administrative Law (OAL) on February 19, 2019. The United States Environmental Protection Agency (USEPA) approved the Pyrethroid Total Maximum Daily Loads (TMDLs) for the nine urban creeks in Sacramento and Roseville on April 22, 2019. With these approvals, the TMDLs and BPA became fully approved and effective.

The City of Stockton (City) [Phase I area] and County of San Joaquin (County) [Phase I and Phase II area] are regulated under the Region-wide Permit[2] and are subject to the Pyrethroid BPA conditional prohibition. A joint Management Plan was developed and submitted by the City and the County in October 2022; it was revised in response to Regional Water Board comments and received approval on August 9, 2023. The City and the County currently implement stormwater programs with several components that address pesticide management and reduction. The Management Plan builds on these efforts so that it leverages the currently implemented activities, while comprehensively addressing the requirements of the BPA.

The BPA requires that the annual progress report document the management practices that have been implemented, evaluate pyrethroid concentrations with respect to the pyrethroid triggers, and identify effective actions to be taken in the future. Accordingly, the City and the County are submitting this progress report in conjunction with the annual report submittal for the Region-wide Permit, due October 1 each year.

2. MANAGEMENT PRACTICES IMPLEMENTED

The Management Plan includes a set of management practices that, taken as a whole, may reasonably be expected to effectively reduce pyrethroid levels in the municipal stormwater discharges. The management practices identified in Section 6c of the BPA were considered for inclusion within the Management Plan. A summary of activities implemented during the reporting period is provided herein.

a. Education and Outreach Activities

The Management Plan includes a range of education and outreach activities for the general public that encourage management practices that minimize pesticide runoff. Both the City and the County have built on the existing stormwater program activities to implement outreach through multiple mechanisms during the past fiscal year, as summarized in **Table 1**.

[1] Resolution R5-2017-0057, approved by OAL on February 19, 2019. Additional information is available on the Regional Water Board website.

[2] Order No. R5-2016-0040-002 issued to City of Stockton; Order No. R5-2016-0040-003 issued to County of San Joaquin.

Table 1. Education and Outreach Activities Implemented During the Fiscal Year

Management Plan Component	Specific Activity Implemented	Summary of Reporting Period Implementation
Education and Outreach Activities		
Resident Outreach	Website – Pesticide-specific outreach for residents is provided on the stormwater website, including a range of information on pesticides and gardening, disposing of pesticides, hiring pest control and landscape professionals, and landscape design and irrigation management to reduce pesticide runoff.	Provided outreach to residents on program website. Topics include tips for waterway pollution prevention, pesticide management recommendations, landscaping and yard maintenance, and household hazardous waste disposal. The websites are available at the following links: • City of Stockton • San Joaquin County
	Our Water – Our World (OWOW)	See **Point-of-Purchase Outreach**
Point-of-Purchase Outreach	OWOW – Contract with an OWOW IPM Advocate to implement the program.	IPM Advocate provided OWOW outreach materials and literature at the Home Depot at 3818 E Hammer Lane, Stockton, CA 95212 and the Home Depot at 2960 Reynolds Ranch Pkwy, Lodi, CA 95240 (**Attachment A**).
Outreach Regarding Pest Control and Landscape Professionals	Website – Outreach is provided on the stormwater website to residents and businesses to help them ensure that whoever is hired utilizes IPM and has the required licenses, registration, certificate, and insurance.	Provided outreach to residents and businesses on its website. Topics covered include Integrated Pest Management, impacts of pyrethroids on waterways, and identifying eco-friendly pest control and landscape professionals. The websites are available at the following links: • City of Stockton • County of San Joaquin
Outreach for Landscape and Irrigation Practices	Website – Outreach is provided on the stormwater website to residents and businesses regarding landscape design and irrigation practices.	Provided outreach to residents and businesses on its website. Topics covered included water conservation, irrigation best practices, and water capture and reuse garden features. The websites are available at the following links: • City of Stockton • County of San Joaquin

Management Plan Component	Specific Activity Implemented	Summary of Reporting Period Implementation
Education and Outreach Activities		
	OWOW – Contract with an OWOW IPM Advocate to implement the program.	IPM Advocate talked directly with potential customers at the Home Depot at 3818 E Hammer Lane, Stockton. Topics covered included landscape management recommendations, including irrigation practices optimized for plant health and minimal runoff (**Attachment A**).

b. Pesticide Pollution Prevention Activities

The Management Plan includes a range of pollution prevention activities that reduce reliance on pesticides that adversely impact water quality. The City and the County have built on the existing stormwater program activities to implement the required pollution prevention BMPs during the past fiscal year, as summarized in **Table 2**.

Table 2. Pesticide Pollution Prevention Activities Implemented During the Fiscal Year

Management Plan Component	Specific Activity Implemented	Summary of Reporting Period Implementation
Pesticide Pollution Prevention Activities		
Practices to Reduce Pesticide Use	Pesticide-Related Policies and Procedures – Implement pesticide-related policies and procedures to reduce reliance on pyrethroids and other pesticides that threaten water quality.	Implementing pesticide-related policies and procedures, including agency-specific Integrated Pest Management (IPM) Policies, Standard Operating Procedures (SOPs) for Application of Pesticides and Herbicides, and Contract Language for Applicators of Pesticides and Herbicides.
	Staff Training – Staff are trained on pesticide-related policies and procedures.	In 2023-2024, staff will be trained on pesticide-related policies and procedures.
Implementation of Integrated Pest Management Policies and Practices	Integrated Pest Management (IPM) Policy – Adopted and implemented an IPM Policy.	Adopted and are implementing agency-specific Integrated Pest Management (IPM) Policies on City- and County-owned/ operated sites and rights-of-way. IPM Policies were approved by the Regional Water Board on August 9, 2023.
Participation in Pesticide Regulatory Processes	California Stormwater Quality Association (CASQA) – Member of and participates in CASQA.	CASQA conducts a number of activities that assist in tracking and reporting on the USEPA and DPR pesticide evaluation and registration activities. CASQA provided a report on their activities during the reporting period in the *2023 CASQA Pesticide Annual Report and Effectiveness Assessment*.

3. EVALUATION OF PYRETHROID CONCENTRATIONS

The BPA requires that the annual progress report evaluates pyrethroid concentrations with respect to the pyrethroid triggers.

As discussed in Section 4.4.2 of the *City of Stockton and County of San Joaquin Municipal Stormwater Program 2022-2023 Annual Report*, the City and County conducted Baseline Monitoring during 2021-2022 at the Calaveras River. Baseline Monitoring results revealed an exceedance of a pyrethroid prohibition trigger, identified on October 22, 2021. As required by the 13267 Order, the City and County developed and submitted a Pyrethroid Monitoring Plan to the Regional Water Board within one year from the date of the exceedance. A joint Management Plan was developed and submitted by the City and the County in October 2022; it was revised in response to Regional Water Board comments and received approval on August 9, 2023.

Pyrethroids analyses did not occur during the 2022-2023 outfall and receiving water monitoring program. Samples from Calaveras River locations will be analyzed during the 2024-2025 reporting period.

4. ADAPTIVE MANAGEMENT

The BPA requires that the annual progress report identify effective actions be taken in the future. As stated in the Management Plan, this information will be identified through the adaptive management process. As a part of the reporting process, and on approximately a five-year timeframe, the City and the County will qualitatively evaluate the effectiveness of the Management Plan, as well as the experience that staff has had in implementing the Management Plan, to identify potential modifications and refine the Management Plan approach, as needed. It is anticipated that the earliest Annual Progress Report with this assessment will be submitted for the 2026-2027 reporting period.

The Management Plan may be reviewed and revised in the future based on the following:

- Analysis of trend monitoring results (5-10 year period of record);
- Completion of the Urban Pesticide Amendments (UPAs)[3] expected to formalize proactive regulation of pesticides by the DPR and identify cost-effective activities that can be implemented or supported by the regulated entities; and
- Identification of changes to improve the effectiveness of specific Management Plan activities, based on its experience in implementing the stormwater program and the specific activities.

[3] https://www.waterboards.ca.gov/water_issues/programs/stormwater/storms/obj6_proj6a.shtml

ATTACHMENT

Attachments for the 2022-2023 Pyrethroid Management Plan Annual Progress Report

Attachment A: Our Water Our World – Final Report for Stockton, California. Integrated Pest Management Advocate Activities for the Period 10/8/2022 to 6/30/2023

Attachment B: Our Water Our World – Final Report for Lodi, California. Integrated Pest Management Advocate Activities for the Period 9/2/2022 to 6/30/2023

ATTACHMENT A

Our Water Our World – Final Report for Stockton, California. Integrated Pest Management Advocate Activities for the Period 10/8/2022 to 6/30/2023

Our Water Our World
Final Report for Stockton California
Integrated Pest Management Advocate Activities
For the Period 10/8/2022 to 6/30/2023
Julie Barbour Consultant
Integrated Pest Management Advocate

Summary:

128 members of the public and 42 store employees were directly interacted with over the reporting period. IPM and OWOW information was highlighted, and made available for people to consult. Full details for all outreach modes are within this report.

For the public, the most popular topics were all aspects of lawn care, choosing and using fertilizers, and adjusting irrigation. When these questions are answered, people have healthier soils and plants, and they can drastically reduce the need for pesticides. Showing how to choose, use and dispose of less toxic pesticides is a part of every interaction.

For employees, the monthly mentoring topics were greatly appreciated. It is impossible to know every disease and insect for the whole year, but it is easy to know what is likely to happen this month. Reviewing what products they have and how to choose and use them is critical.

Equally important is prevention. Talking with employees about exclusion materials, caulk, paint, mulch, soils, irrigation and more. Bringing the whole store into the tools available for keeping yards, gardens and homes safe, while protecting the water.

A great benefit to employees this year was stressing Spanish resources. OWOW in Spanish, and IPM in Spanish Notas Breves en español (Spanish Quick Tips) --UC IPM (ucanr.edu).

Background:

Our Water, Our World Mission:
The purpose of the Our Water Our World (OWOW) program is to raise awareness of the connection between pesticide use and water quality by providing information to retailers and consumers at the point-of-purchase about Integrated Pest Management (IPM) and less-toxic alternatives that do not cause water quality problems.

Our Water, Our World History:
OWOW started as a pilot project in 1998, in just a handful of stores, initiated by the Contra Costa County Sanitation District, the City of Palo Alto Regional Water Quality Control Plant, and the Marin Countywide Stormwater Pollution Prevention Program.

The program quickly grew and was administered by the former Bay Area Stormwater Management Agencies Association from 1999 – 2021. During that time, over 130 agencies in 16 counties implemented the program, working in approximately 239 stores.

Starting in January 2022, the program was transferred to California Stormwater Quality Association (CASQA) https://www.casqa.org/ , with the goal of providing statewide access to this important and successful outreach program.

Statutory Background:
The National Pollutant Discharge Elimination System (NPDES) is a permitting program that addresses water pollution by regulating point sources that discharge pollutants to waters in the United States. https://www.epa.gov/npdes/about-npdes#overview

Ground Water Runoff Impacts:
Runoff from homes is a significant concern to water safety and conservation. Pesticides runoff along with the water and enter the larger water systems, where it collects and stays available as an active pesticide and harms unintended populations. Pesticides are not removed in water treatment plants, and are able to persist for years and miles in both soil and water when used improperly.

Ground Water – Retail Pesticide Nexus
Retailers and customers have access to significant amounts and types of pesticides. With information, both retail and customers have a better understanding of how to use a pesticide, if any is deemed necessary, to target the pest without unintended and far-reaching consequences far beyond the boundaries of their own front yard. The OWOW outreach is a component of the jurisdiction's pyrethroid management plan.

Integrated Pest Management:

Role of the University of California (UC) with the IPM Advocate:
All information, training, and materials provided by the IPM Advocate are based upon information published by UC. The IPM Advocate does not create new information. What the IPM Advocate does is extract relevant pest management information particular to a specific situation within a certain location and time and provide it the public or retail establishments. This extraction and synthesis is critical, and requires a deep understanding of the material, both of UC material and the pesticide active ingredients and labels.

Raising Public Awareness of IPM

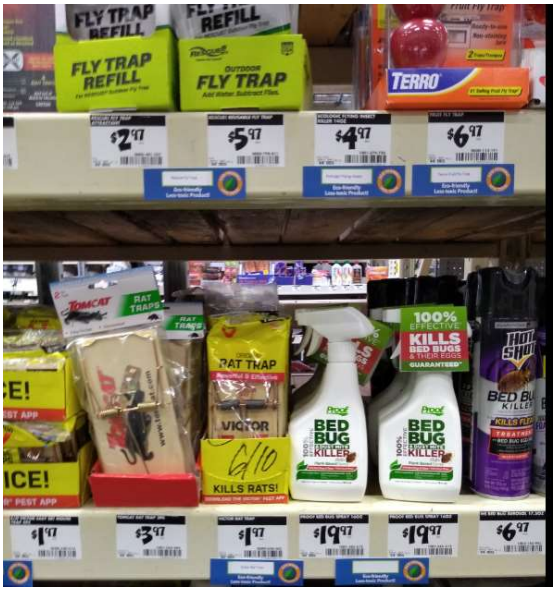
Providing IPM and OWOW services and information relies on education of alternatives to pesticides, the proper use and disposal of pesticides, and assistance with the proper use, timing and dosage of pesticides.

Embedded within IPM and OWOW is a why a pest might need attention and how one can make their yard less hospitable to that pest. This includes but is not limited to: How to properly water, prune, fertilize and place plants for optimum health. For soils, there is compost, mulch, and avoiding pesticides that harm soil health by harming beneficial insects that live in that soil. Relieve the stress that is allowing a plant to be harmed by unhealthy numbers of insects or disease. If that is not enough, choosing the right pesticide that is the least toxic to other organisms and the water. And then review the instructions for optimum results the first time so additional pesticides, even less toxic pesticides, are needed less often, if at all.

Outreach Modes:

Outreach Activities at Retail Stores:

Store Set Up:



Least Toxic Shelf Tags

Least Toxic Shelf Tags:
Least toxic shelf tags are tags placed near gardening products on store shelves. They identify those products which are have minimal environmental impact. This can include products such as rodent controls that have corn gluten and sodium as the active ingredient, as opposed to the more traditional warfarin or Brodifacoum, which also kills wildlife and pets. Other examples include organic fertilizers, and non-chemical traps, hormones, and beneficial insects in lieu of pyrethroids. These tags are set up once a year, reset once a year, and updated as necessary during regularly scheduled visits to stores.

Literature Racks and QR Code Displays:
A display of OWOW fact sheets and/or QR code links to OWOW is available in each retail location near the gardening products. These address a number of common gardening situations and least toxic

OWOW QR Code Display

OWOW Literature Rack

approaches. All these OWOW links may be found at Our Water Our World. The rack has 21 available shelves, and the QR codes has 20 links.

In addition the literature rack has OWOW banners prominently placed on it and has card-sized slots to hold booklets which explain the significance of least toxic shelf tags and the least toxic approach. The literature rack is refilled during regularly scheduled store visits.

Stores Serviced Under This Contract

Store Name	Location	Has Literature Rack	Has QR Codes	Has Shelf Tags
Home Depot	3818 E Hammer Ln, Stockton, CA 95212	Y	Y	Y

Regularly Scheduled Store Visits:
Regularly scheduled visits to retail outlets is an integral feature of the IPM program. During these visits, the IPM Advocate interacts with store staff to assure they are aware of the IPM resources available to them (including the least toxic shelf tags, literature rack, and relevant websites). During these visits the IPM Advocate also educates the store staff with regard to pests that are currently most prevalent and best practices to ameliorate issues relating to those pests. During these visits the IPM Advocate also models appropriate customer interaction for the staff. This involves approaching a customer, asking what condition they are attempting to correct with their planned purchase, clarifying what non-chemical approaches should be tried first, then, if necessary, helping them to select an appropriate product that is effective and least toxic. Finally, during the store visits, shelf tags and literature racks or QR codes displays are maintained.

Mentoring Employee at Home Depot

Store Visit Summary

Total Store Visits	Total Employees Mentored	Total Customers Interacted With
10	**38**	**69**

Formal In Store Public Outreach Events:

These outreach events are typically held in each store once a year and last approximately four hours. They are designed to accomplish the maximum level of general public education by targeting members of the public while they are in store. The IPM Advocate sets up a table and display with fact sheets and information they share with the public. Education takes the form of customers approaching the table with topics and questions and the Advocate approaching customers who are considering purchase of a gardening chemical. Information relating to IPM, specific pesticide use, general pesticide issues, and waterway conditions are commonly discussed with the customers. It is also common for store employees to approach the IPM Advocate during these events with specific questions.

OWOW Table at Home Depot

Store Outreach Summary

Total Store Outreach Events	Total Employees Interacted with	Total Customers Interacted With
1	4	14

Formal OWOW Training for Store Employees:

Annual training for store employees is optimally performed at the store in a conference room. The training normally takes four hours. Some stores schedule employees for training, including paying employees who are otherwise not scheduled to work to attend the training. Other stores require the IMP Advocate to locate employees and provide training in the store aisles. The training is tailored to individual stores. In addition to the topics covered under "Raising Public Awareness" above, this training also address specific gardening chemicals in that store, methods of interacting with customers to steer them towards least toxic alternatives, and availability of the IPM Advocate as a resource. Employees are provided the IPM Advocate's cell phone number and email address for future questions. A folder is provided to store employees that contains insect identification guides, pesticide use guidelines and links to obtain more information and continuing education on pest management and Household Hazardous Waste disposal locations etc. Employees are also encouraged to subscribe to the

quarterly UC IPM newsletter for retail nurseries and garden centers on invasive and seasonal pests and their control.

Employee Training Summary

Total Employee Training Events	Total Employees Trained
1	4

Outreach Outside Stores:

General Public Outreach Events:

These are events sponsored by the jurisdiction, usually with a natural science (including environmental issues) focus in a family friendly environment The IPM Advocate sets up a table and display with fact sheets and information they share with the public. The focus is on general IPM concepts and the harm caused by improper use of pesticides. Information relating to IPM, specific pesticide use, general pesticide issues, and waterway conditions are commonly discussed with these events.

OWOW Table at Stockton Makers Market

Public Outreach Summary

Total Outreach Events	Total Members of the Public Directly Interacted With
2	41

ATTACHMENT B

Our Water Our World – Final Report for Lodi, California. Integrated Pest Management Advocate Activities for the Period 9/2/2022 to 6/30/2023

Our Water Our World
Final Report for Lodi California
Integrated Pest Management Advocate Activities
For the Period 9/2/2022 to 6/30/2023
Julie Barbour Consultant
Integrated Pest Management Advocate

Summary:

110 members of the public and 39 store employees were directly interacted with over the reporting period. IPM and OWOW information was highlighted, and made available for people to consult. Full details for all outreach modes are within this report.

For the public, the most popular topics were all aspects of lawn care, choosing and using fertilizers, and adjusting irrigation. When these questions are answered, people have healthier soils and plants, and they can drastically reduce the need for pesticides. Showing how to choose, use and dispose of less toxic pesticides is a part of every interaction.

For employees, the monthly mentoring topics were greatly appreciated. It is impossible to know every disease and insect for the whole year, but it is easy to know what is likely to happen this month. Reviewing what products they have and how to choose and use them is critical.

Equally important is prevention. Talking with employees about exclusion materials, caulk, paint, mulch, soils, irrigation and more. Bringing the whole store into the tools available for keeping yards, gardens and homes safe, while protecting the water.

A great benefit to employees this year was stressing Spanish resources. OWOW in Spanish, and IPM in Spanish Notas Breves en español (Spanish Quick Tips) --UC IPM (ucanr.edu).

Background:

Our Water, Our World Mission:
The purpose of the Our Water Our World (OWOW) program is to raise awareness of the connection between pesticide use and water quality by providing information to retailers and consumers at the point-of-purchase about Integrated Pest Management (IPM) and less-toxic alternatives that do not cause water quality problems.

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The program quickly grew and was administered by the former Bay Area Stormwater Management Agencies Association from 1999 – 2021. During that time, over 130 agencies in 16 counties implemented the program, working in approximately 239 stores.

Starting in January 2022, the program was transferred to California Stormwater Quality Association (CASQA) https://www.casqa.org/ , with the goal of providing statewide access to this important and successful outreach program.

Statutory Background:
The National Pollutant Discharge Elimination System (NPDES) is a permitting program that addresses water pollution by regulating point sources that discharge pollutants to waters in the United States. https://www.epa.gov/npdes/about-npdes#overview

Ground Water Runoff Impacts:
Runoff from homes is a significant concern to water safety and conservation. Pesticides runoff along with the water and enter the larger water systems, where it collects and stays available as an active pesticide and harms unintended populations. Pesticides are not removed in water treatment plants, and are able to persist for years and miles in both soil and water when used improperly.

Ground Water – Retail Pesticide Nexus
Retailers and customers have access to significant amounts and types of pesticides. With information, both retail and customers have a better understanding of how to use a pesticide, if any is deemed necessary, to target the pest without unintended and far-reaching consequences far beyond the boundaries of their own front yard. The OWOW outreach is a component of the jurisdiction's pyrethroid management plan.

Integrated Pest Management:

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Raising Public Awareness of IPM

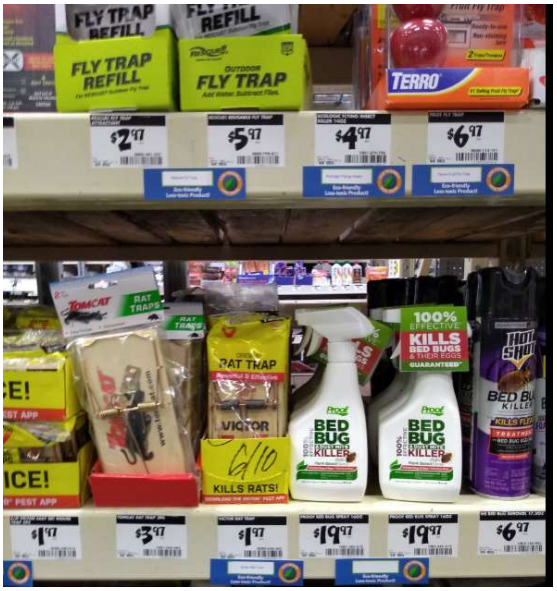
Providing IPM and OWOW services and information relies on education of alternatives to pesticides, the proper use and disposal of pesticides, and assistance with the proper use, timing and dosage of pesticides.

Embedded within IPM and OWOW is a why a pest might need attention and how one can make their yard less hospitable to that pest. This includes but is not limited to: How to properly water, prune, fertilize and place plants for optimum health. For soils, there is compost, mulch, and avoiding pesticides that harm soil health by harming beneficial insects that live in that soil. Relieve the stress that is allowing a plant to be harmed by unhealthy numbers of insects or disease. If that is not enough, choosing the right pesticide that is the least toxic to other organisms and the water. And then review the instructions for optimum results the first time so additional pesticides, even less toxic pesticides, are needed less often, if at all.

Outreach Modes:

Outreach Activities at Retail Stores:

Store Set Up:

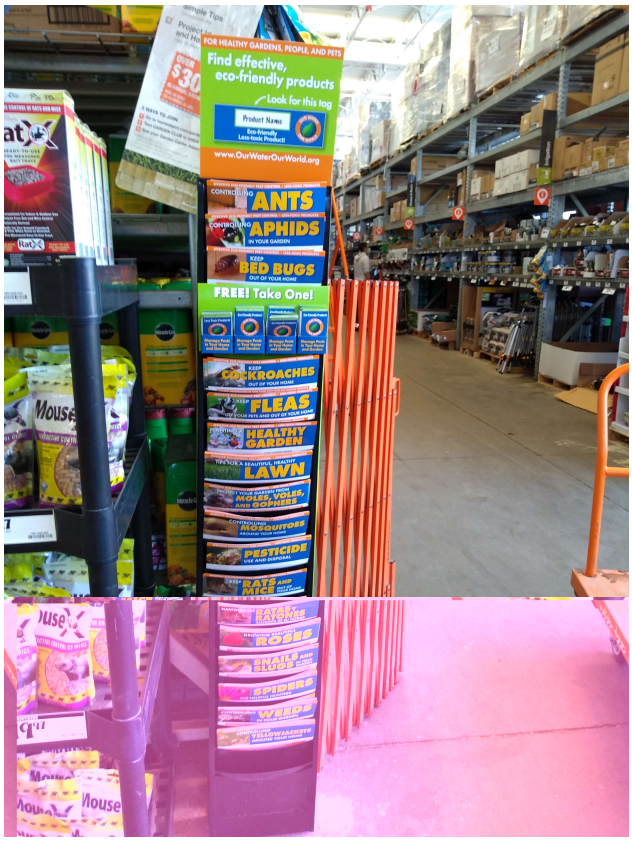


Least Toxic Shelf Tags

Least Toxic Shelf Tags:
Least toxic shelf tags are tags placed near gardening products on store shelves. They identify those products which are have minimal environmental impact. This can include products such as rodent controls that have corn gluten and sodium as the active ingredient, as opposed to the more traditional warfarin or Brodifacoum, which also kills wildlife and pets. Other examples include organic fertilizers, and non-chemical traps, hormones, and beneficial insects in lieu of pyrethroids. These tags are set up once a year, reset once a year, and updated as necessary during regularly scheduled visits to stores.

Literature Racks and QR Code Displays:
A display of OWOW fact sheets is placed in each retail location near the gardening products. These sheets address a number of common gardening situations and least toxic approaches. All these sheets can be found at Our Water Our World. This display can be a literature rack or QR codes with links to the OWOW fact

OWOW QR Code Display



OWOW Literature Rack

sheets The rack has 21 available shelves which are filled with OWOW fact sheets. In addition the literature rack has OWOW banners prominently placed on it and has card-sized slots to hold booklets which explain the significance of least toxic shelf tags and the least toxic approach. The literature rack is refilled during regularly scheduled store visits.

Stores Serviced Under This Contract

Store Name	Location	Has Literature Rack	Has QR Codes	Has Shelf Tags
Home Depot	2960 Reynolds Ranch Pkwy, Lodi, CA 95240	Y	Y	Y

Regularly Scheduled Store Visits:

Regularly scheduled visits to retail outlets is an integral feature of the IPM program. During these visits, the IPM Advocate interacts with store staff to assure they are aware of the IPM resources available to them (including the least toxic shelf tags, literature rack, and relevant websites). During these visits the IPM Advocate also educates the store staff with regard to pests that are currently most prevalent and best practices to ameliorate issues relating to those pests. During these visits the IPM Advocate also models appropriate customer interaction for the staff. This involves approaching a customer, asking what condition they are attempting to correct with their planned purchase, clarifying what non-chemical approaches should be tried first, then, if necessary, helping them to select an appropriate product that is effective and least toxic. Finally, during the store visits, shelf tags and literature racks or QR codes displays are maintained.

Mentoring Employee at Home Depot

Store Visit Summary

Total Store Visits	Total Employees Mentored	Total Customers Interacted With
10	**34**	**62**

Formal In Store Public Outreach Events:

These outreach events are typically held in each store once a year and last approximately four hours. They are designed to accomplish the maximum level of general public education by targeting members of the public while they are in store. The IPM Advocate sets up a table and display with fact sheets and information they share with the public. Education takes the form of customers approaching the table with topics and questions and the Advocate approaching customers who are considering purchase of a gardening chemical. Information relating to IPM, specific pesticide use, general pesticide issues, and waterway conditions are commonly discussed with the customers. It is also common for store employees to approach the IPM Advocate during these events with specific questions.

OWOW Table at Home Depot

Store Outreach Summary

Total Store Outreach Events	Total Employees Interacted with	Total Customers Interacted With
1	0	16

Formal OWOW Training for Store Employees:

Annual training for store employees is optimally performed at the store in a conference room. The training normally takes four hours. Some stores schedule employees for training, including paying employees who are otherwise not scheduled to work to attend the training. Other stores require the IMP Advocate to locate employees and provide training in the store aisles. The training is tailored to individual stores. In addition to the topics covered under "Raising Public Awareness" above, this training also address specific gardening chemicals in that store, methods of interacting with customers to steer them towards least toxic alternatives, and

Training for Home Depot Employees

availability of the IPM Advocate as a resource. Employees are provided the IPM Advocate's cell phone number and email address for future questions. A folder is provided to store employees that contains insect identification guides, pesticide use guidelines and links to obtain more information and continuing education on pest management and Household Hazardous Waste disposal locations etc. Employees are also encouraged to subscribe to the quarterly UC IPM newsletter for retail nurseries and garden centers on invasive and seasonal pests and their control.

Employee Training Summary

Total Employee Training Events	Total Employees Trained
1	5

Outreach Outside Stores:

<u>General Public Outreach Events:</u>
These are events sponsored by the jurisdiction, usually with a natural science (including environmental issues) focus in a family friendly environment The IPM Advocate sets up a table and display with fact sheets and information they share with the public. The focus is on general IPM concepts and the harm caused by improper use of pesticides. Information relating to IPM, specific pesticide use, general pesticide issues, and waterway conditions are commonly discussed with these events.

OWOW Table at Lodi Farmers Market

Public Outreach Summary

Total Outreach Events	Total Members of the Public Directly Interacted With
1	16

OWOW Literature:
Lodi uses thirteen of the OWOW fact sheets. The specific fact sheets and the numbers distributed to the public are in the table below. Overall 683 fact sheets were distributed, either through the in-store literature rack or direct distribution at public events.

The decision about whether or not to order more can be made closer to the open ordering time.

Fact Sheets	Total Used
Ants	70
Aphids	62
Mosquitoes	45
Yellowjackets	50
Roses	40
Cockroaches	50
Moles-Voles,-Gophers	40
Rats and Mice	50
Pesticide Use-Disposal	56
Healthy Garden	60
Snails- Slugs	70
Pesticide Use-Disposal (in Spanish)	50
Finding a Pest Control Company	40