Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Watershed Monitoring and Assessment Program

Integrated Monitoring Report
Executive Summary

Water Years 2020 – 2025 (October 2019 – September 2025)

Submitted in compliance with Provision C.8.h.v of NPDES Permit No. CAS612008,
Order No. R2-2022-0018

March 31, 2026

This report is submitted by the agencies participating in the

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

City of Campbell	City of Milpitas	City of Santa Clara
City of Cupertino	City of Monte Sereno	City of Saratoga
City of Los Altos	City of Mountain View	City of Sunnyvale
Town of Los Altos Hills	City of Palo Alto	County of Santa Clara
Town of Los Gatos	City of San José	Valley Water

Cover photo credits left to right: Landsat/Copernicus; Integral.; EOA, Inc.; EOA, Inc.

Prepared for:

Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP)

Prepared by:

EOA, Inc.
1410 Jackson St., Oakland, CA 94612

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Introduction and Background

This *Integrated Monitoring Report* (IMR) summarizes water quality monitoring conducted by the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP or Program) during Water Years (WYs) 2020–2025. The IMR was prepared on behalf of SCVURPPP's 15 member agencies to fulfill Municipal Regional Permit Provision C.8 reporting requirements and to evaluate the effectiveness of stormwater management actions, assess receiving water conditions, detect trends in water quality over time, identify appropriate management actions, and inform future monitoring program implementation.

SCVURPPP is one of five Bay Area countywide stormwater programs operating under a shared National Pollutant Discharge Elimination System (NPDES) permit, referred to as the Municipal Regional Permit (MRP), issued by the San Francisco Bay Regional Water Quality Control Board (Regional Water Board or SFBRWQCB). Monitoring addressed in this IMR was conducted under both the prior MRP (MRP 2.0) and current MRP (MRP 3.0, which became effective July 1, 2022) and reflects data collected since the previous IMR (SCVURPPP 2020), excluding Creek Status Monitoring.

Monitoring data were collected through a combination of countywide and regional efforts, in collaboration with the Bay Area Municipal Stormwater Collaborative (BAMSC) Regional Monitoring Coalition (RMC). In addition, SCVURPPP actively participates in the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP), which focuses on assessing Bay water quality and associated impacts. In compliance with Provisions C.8.c and C.8.f of the MRP, SCVURPPP provides financial contributions towards implementing the RMP.[1]

All data were collected and validated in accordance with approved monitoring plans and quality assurance project plans (QAPPs) and were submitted by SCVURPPP to the Regional Water Board on behalf of Santa Clara County Permittees in SWAMP-comparable formats pursuant to Provision C.8.h.ii of the MRP. These data may be obtained via the California Environmental Data Exchange Network (CEDEN).

This IMR consists of five Parts (A–E), addressing major MRP Provision C.8 monitoring elements, as well as the C.8 budget summary (Part E), as required by Provision C.8.h.v. The sections below summarize key findings and implications from each Part.

- Part A: Low Impact Development (LID) Effectiveness Monitoring
- Part B: Trash Monitoring
- Part C: Pesticides and Toxicity Monitoring
- Part D: Pollutants of Concern (POC) Monitoring
- Part E: Provision C.8 Budget Summary

In addition to summarizing monitoring activities, key findings, and data interpretations, each Part of this Integrated Monitoring Report includes recommendations intended to inform development of the next MRP (MRP 4.0). These recommendations are based on implementation experience under MRP 3.0 and are intended to improve the utility, efficiency, and clarity of future monitoring requirements. The Program anticipates that potential modifications to Provision C.8 monitoring requirements will be discussed through the Provision C.8 workgroup process, with participation

[1] See https://www.sfei.org/programs/sf-bay-regional-monitoring-program for details on the RMP.

by Permittees, the Regional Water Board, and other stakeholders to evaluate monitoring objectives, data utility, and program costs, and to identify opportunities to refine monitoring requirements in support of effective stormwater management and protection of beneficial uses.

Part A: Low Impact Development (LID) Effectiveness Monitoring

Part A of the IMR reports all LID Effectiveness monitoring activities conducted by SCVURPPP during WY 2023 through WY 2025 in compliance with Provision C.8.d. This represents the first multi-year, regional synthesis of LID monitoring data collected by SCVURPPP and other members of the BAMSC RMC.

Provision C.8.d requires Permittees to conduct LID monitoring to address two primary management questions: (1) the pollutant removal and hydrologic performance of LID facilities over time, and (2) the minimum levels of operations and maintenance (O&M) necessary to maintain effectiveness. In Santa Clara County, a minimum of 25 paired influent/effluent water quality sampling events must be conducted over the MRP3.0 permit term, with a minimum of three events annually beginning in WY 2024. Each sampling event must consist of paired flow- or time-weighted composite samples of the LID facility influent and effluent collected with automated samplers. Samples were analyzed for dissolved and total mercury, dissolved and total copper, dissolved and total zinc, hardness, pH, total suspended solids (TSS), total petroleum hydrocarbons (TPH), total polychlorinated biphenyls (PCBs), and 40 per- and polyfluoroalkyl substances (PFAS).

During WYs 2024 and 2025, SCVURPPP implemented stormwater and hydrologic monitoring at two bioretention facilities constructed as part of the Top Golf Public Green Street Project in the City of San José. Monitoring included continuous flow measurement, event-based flow-weighted composite sampling of influent and effluent, and, beginning in WY 2025, shallow groundwater monitoring to support water balance analyses. The monitoring design and methods evolved over the reporting period in response to initial field experience, conditional approval comments from Water Board staff, and input from the LID Technical Advisory Group (TAG), with a revised Monitoring Plan (SCVURPPP 2024) and Regional QAPP (BAMSC 2025) implemented starting in WY 2025.

A.1 Hydrologic and Water Quality Monitoring

Hydrologic monitoring demonstrated that Treatment Control Measure 6 (TCM6) bioretention facility provided measurable runoff volume reduction through a combination of storage, infiltration, and delayed discharge, with no overflow observed during monitored storm events. Water balance analyses conducted using continuous flow and groundwater data improved understanding of facility functioning and supported interpretation of pollutant load reductions. Figure A.1 presents cumulative water balance inputs and outputs of all monitored storms. Monitoring at the second facility (Treatment Control Measure 4) was constrained during WY 2024 and WY 2025 because effluent discharge was rarely observed, preventing collection of paired influent/effluent samples as required by Provision C.8.d. Although this condition suggests a high degree of infiltration, it limited the ability to evaluate treatment performance using MRP required metrics.

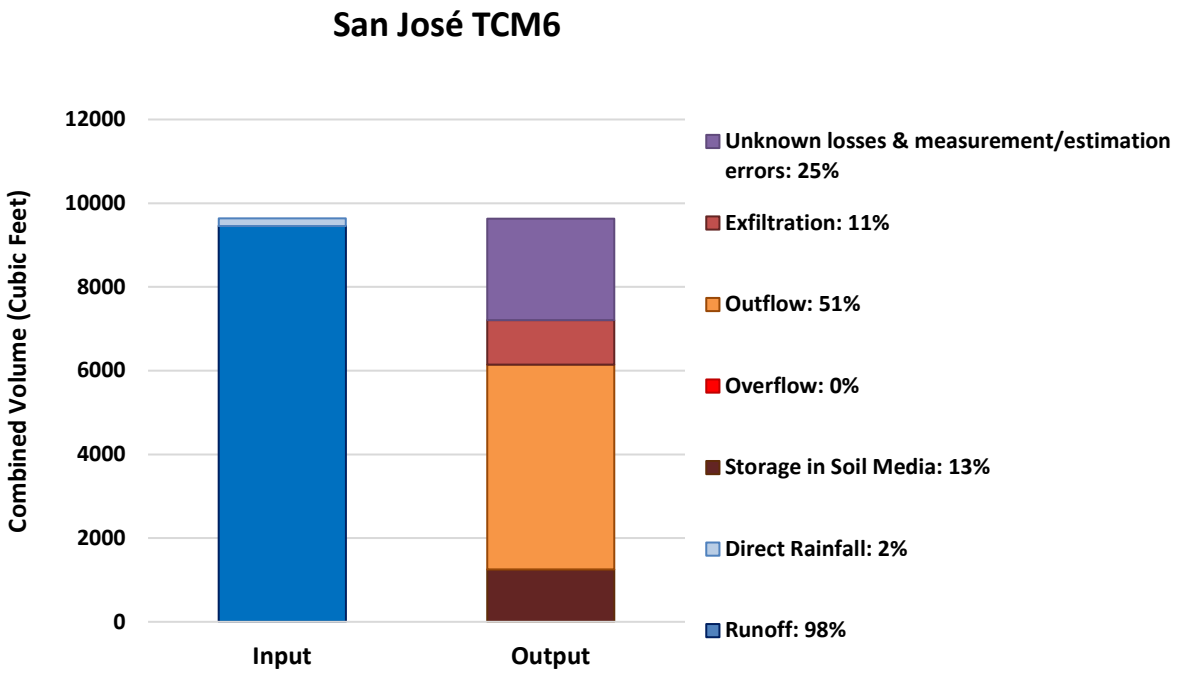

Figure A.1. Cumulative water balance for all monitored WY 2024 – WY 2025 storm events at the TCM6 bioretention facility in San José, CA.

Water quality monitoring results from TCM6 indicate that effluent concentrations and loads for sediment-associated pollutants (TSS; total copper, mercury, and zinc; and total PCBs), as well as TPH and dissolved zinc, were lower than corresponding influent values in each monitored storm event and cumulatively across the study period. Results for dissolved mercury, dissolved copper, and PFAS were more variable, with effluent concentrations sometimes exceeding influent concentrations in individual storm events. However, load-based analyses, which account for both changes in concentration and reductions in runoff volume, showed greater treatment effectiveness than concentration-only metrics, with cumulative load reductions exhibited for all constituents except PFAS. Similar results were observed regionwide. The importance of evaluating performance using load reductions, rather than concentration changes, is demonstrated in Figures A.2 and A.3, which compare both metrics for TSS and dissolved copper as surrogates for sediment-bound and dissolved constituents, respectively.

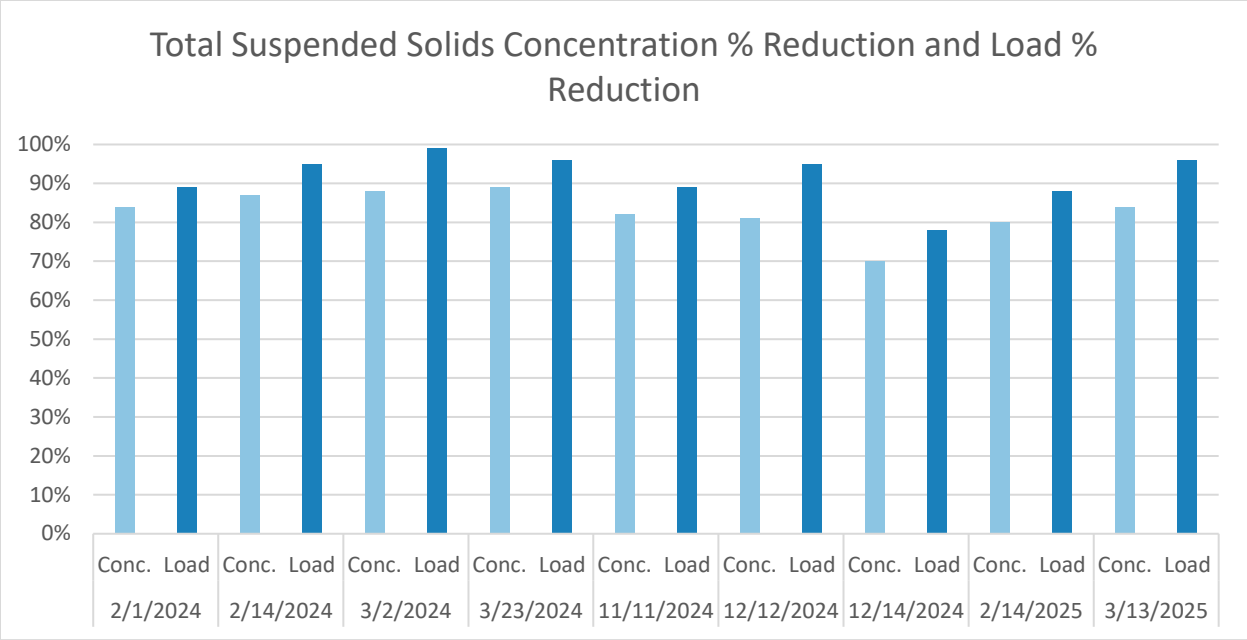

Figure A.2. TSS Concentration vs Load % Reductions per storm event (WYs 2024 - 2025) at the TCM6 bioretention facility in San José, CA.

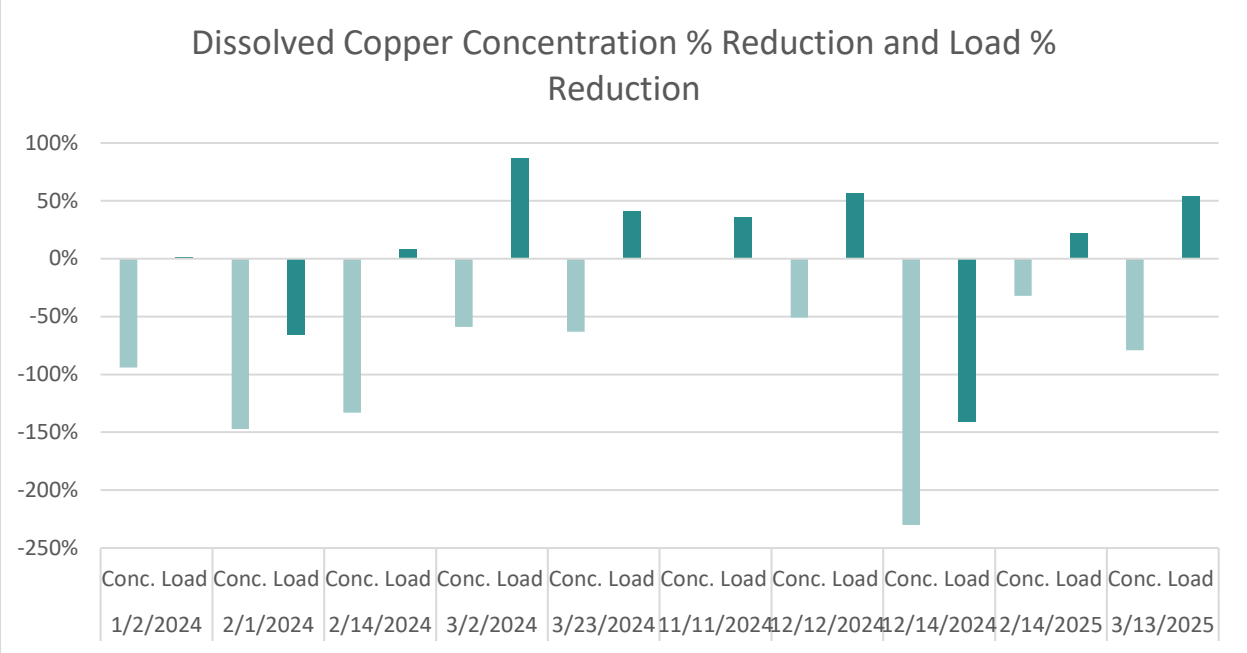

Figure A.3. Dissolved Copper Concentration vs Load % Reductions per storm event (WYs 2024 - 2025) at the TCM6 bioretention facility in San José, CA. Negative results indicate increases in pollutant concentration or load.

A.2 Maintenance Assessments

Maintenance assessments conducted throughout the monitoring period documented the condition of the facilities and maintenance activities performed. These data, in combination with regional LID monitoring results compiled by BAMSC, provide preliminary insights into how facility design and O&M practices may influence performance. Results are preliminary due to small sample sizes but no statistically significant relationship between maintenance frequency and hydrologic and water quality results were detected, indicating that existing maintenance schedules are sufficient to maintain LID performance in most instances. However, the act of monitoring itself requires structural and operational modifications at the monitored facilities, thereby limiting the ability to directly assess the effects of maintenance schedules using monitored facilities.

A.3 Recommendations for LID Monitoring During MRP 4.0

Overall, the WY 2023–2025 LID monitoring results demonstrate that implementation of Provision C.8.d is feasible but resource-intensive and operationally complex, reflecting the scope of field sampling, analytical requirements, and reporting obligations required by MRP 3.0 and expanded through the LID Monitoring Plan approval process. Based on two years of local and regional monitoring results, SCVURPPP and its BAMSC partners are using the findings summarized in the Integrated LID Monitoring Status Report to inform specific recommendations for MRP 4.0 intended to enhance the utility and efficiency of LID monitoring.

For MRP 4.0, SCVURPPP recommends retaining Management Question #1, which addresses pollutant removal and hydrologic performance of LID facilities. Management Question #2, which focuses on the relationship between O&M and LID performance, is recommended for elimination because it cannot be meaningfully evaluated at actively monitored facilities. Further, Management Question #2 is addressed on a larger scale through implementation of the Asset Management Plans and associated condition assessments required under Provision C.21. If elimination of Management Question #2 is not feasible, SCVURPPP recommends refining it to rely on Asset Management condition assessment data rather than LID effectiveness monitoring.

Additional recommendations include reducing minimum storm-event sampling requirements while extending LID monitoring into future permit terms to better support evaluation of long-term trends. The recommendations also propose focusing analytical efforts on constituents that meaningfully inform LID effectiveness by removing analytes such as TPH and PFAS that have limited interpretive value in the context of LID monitoring. Further proposed changes include modifying the role and frequency of TAG engagement and streamlining reporting to emphasize routine data submittal and periodic long-term synthesis rather than annual interpretation. Collectively, these recommendations are intended to support a more sustainable and effective LID monitoring framework under MRP 4.0 while continuing to address the core objectives of Provision C.8.

Part B: Trash Monitoring

Provision C.8.e directs Permittees to conduct trash monitoring at municipal separate storm sewer system (MS4) outfalls and in receiving waters, and prescribes specific monitoring station criteria, methods and frequencies that must be achieved to address the management and monitoring questions listed in MRP 3.0. Part B of the IMR contains two Trash Monitoring Progress Reports: Trash Outfall Monitoring (Part B1) and Trash Receiving Water Monitoring (Part B2).

The reports were prepared collaboratively by member Programs of BAMSC with partial funding for their development from the Watching Our Watersheds (WOW) Regional Trash Monitoring Project which is funded through the USEPA Water Quality Improvement Fund (WQIF). The reports describe Provision C.8.e Trash Monitoring requirements and how each BAMSC Program complied with the requirements including planning activities initiated in WY 2023 and monitoring conducted during WY 2024 and WY 2025.

B.1 Trash Technical Advisory Group

Both components of Provision C.8.e trash monitoring (i.e., outfall and receiving water monitoring) were informed by the Trash Monitoring Technical Advisory Group (Trash TAG), which was formed by BAMSC in WY 2023. The Trash TAG is comprised of impartial science advisors and Regional Water Board staff. Trash TAG meetings conducted during WY 2023 through WY 2025 provided guidance on monitoring plan development, review of initial monitoring results, and discussion of potential refinements to future monitoring approaches.

B.2 Trash Outfall Monitoring

A minimum of 11 MS4 outfalls regionwide, including three in Santa Clara County, must be monitored for trash discharge during a minimum of three wet weather events per year beginning October 1, 2023 (WY 2024). Trash outfall monitoring must be conducted with netting devices (or equivalent) attached to the end of outfall pipes or other equivalent locations that allow for capture of trash discharging through the MS4. Targeted outfalls must drain areas that are controlled to the low trash generation level (i.e., less than 5 gallons per acre per year) and must be representative with respect to the types of trash controls present across the region. Provision C.8.e.ii also requires direct measurement of flow at the monitoring station (to calculate loading) and collection of data on the type of material collected.

In Santa Clara County, SCVURPPP monitored three MS4 outfalls during WY 2024 and WY 2025 draining to San Francisquito Creek (SC-SFC), Stevens Creek (SC-STE), and Coyote Creek (SC-COY). Trash sampling at all three sites was conducted using an Oldcastle NetTech™ Gross Pollutant Trap system (trash net device) with 5 mm mesh size. Trash samples were successfully collected during targeted storm events at all three sites, although equipment malfunctions and vandalism limited sampling to two storm events at SC-STE and SC-COY during WY 2025. Event-based trash volumes normalized by drainage area were low at all Santa Clara County sites, and estimated annual trash loading rates were well below the low trash generation threshold of 5 gallons per acre per year. These results indicate that trash management actions implemented in the monitored catchments are generally effective at limiting trash discharges from the MS4.

Annual trash loading rates were calculated using event-based trash volumes combined with measured or modeled flow data and applied to all qualifying storm events during the wet

season. Trash collected during each monitoring event was characterized into 13 categories, with plastic materials comprising the majority of trash observed at all Santa Clara County sites.

Results from Santa Clara County were consistent with regionwide findings. Across all BAMSC outfall monitoring sites, the majority of event-based trash volumes were low, and estimated annual trash loading rates were below the low trash generation threshold. Collectively, the regional results provide additional confirmation that trash controls are performing as intended.

B.3 Trash Receiving Water Monitoring

Provision C.8.e of MRP 3.0 requires implementation of a pilot program to directly monitor trash in receiving waters that receive runoff primarily from MS4 outfalls draining areas controlled to the low trash generation level. Receiving water monitoring was initiated in WY 2025 following development and Regional Water Board approval of a Regional Trash Receiving Water Monitoring Plan and associated Quality Assurance Project Plan (QAPP). All receiving water monitoring was implemented regionally through the Watching Our Watersheds (WOW) project.

Regionwide, six receiving water sites were monitored during WY 2025, including two sites in Santa Clara County: Adobe Creek in the City of Palo Alto (SC-ADO) and Lower Penitencia Creek in the City of Milpitas (SC-LPA). Sites were selected to represent receiving waters downstream of MS4 drainage areas controlled to the low trash generation level and to avoid known direct trash inputs such as illegal dumping sites or encampments. Monitoring was conducted during wet weather events likely to mobilize trash through the MS4 system, with sampling timed to capture different portions of the storm hydrograph.

Trash was collected using a modified box trawl equipped with a 5-mm mesh net. Individual subsamples (aliquots) were collected over short deployment periods (generally 10 to 30 minutes) during storm events to evaluate when trash transport was most likely to occur (rising limb, peak, falling limb). Trash volumes were normalized by contributing drainage area, and annual trash loading rates were estimated using event-based measurements combined with flow data from nearby stream gages.

Results from WY 2025 indicate that trash volumes observed in receiving waters were generally low. Estimated annual trash loading rates at all monitored sites, including both Santa Clara County locations, were below the low trash generation threshold of 5 gallons per acre per year. Plastic materials comprised the majority of trash observed, consistent with outfall monitoring results.

While the data generated during WY 2025 are informative for advancing scientific understanding of trash transport in receiving waters and for testing the application of the Box Trawl method, the trash receiving water monitoring program does not directly address the primary Management Questions in the MRP, which focus on the effectiveness of trash management actions and whether low trash generation conditions are being achieved. Further, the pilot effort required substantial field effort and relied heavily on external grant funding.

B.4 Recommendations for Trash Monitoring in MRP 3.0 and MRP 4.0

During WY 2026, SCVURPPP will continue to comply with all aspects of MRP Provision C.8.e. This includes working with BAMSC to convene at least one Trash TAG meeting to support interpretation of results and discussion of potential refinements. SCVURPPP will also continue to conduct trash outfall monitoring and trash receiving water monitoring (via the WOW project),

with the goal of collecting trash samples during a minimum of three storm events at all sites over the course of the wet season, consistent with MRP 3.0 requirements.

Findings from WYs 2023 through 2025 indicate that trash outfall monitoring provides the most direct and useful information for confirming the performance of trash management actions. Event-based trash volumes and estimated annual trash loading rates were consistently low at monitored outfalls in Santa Clara County and regionwide, indicating that trash controls are generally effective. Based on these results, SCVURPPP recommends that trash outfall monitoring continue into MRP 4.0 as the primary monitoring tool, with refinements to improve efficiency and reduce costs, such as refining storm selection criteria, reducing or eliminating trash characterization, and increasing flexibility in monitoring requirements.

Given the limited incremental management value of trash receiving water monitoring relative to its cost and implementation effort, SCVURPPP does not recommend continuation of trash receiving water monitoring under MRP 4.0.

Part C: Pesticides and Toxicity Monitoring

Part C of the IMR presents all data collected in compliance with provision C.8.g (Pesticides and Toxicity Monitoring) during WY 2016 through WY 2025. Toxicity testing is used to assess the acute and chronic toxic effects of chemicals in water and sediment samples collected from receiving waters and allows for evaluation of the cumulative effect of multiple constituents. Because different test organisms are sensitive to different classes or combinations of chemicals, several types of organisms are used. Water samples are tested using five organisms and seven toxicity endpoints, while sediment samples are tested using two organisms. In addition, sediment and water are monitored for a variety of potential pollutants concurrent with toxicity testing to provide preliminary insight into the possible causes of toxicity, should it be observed. Provision C.8.g requires the collection of two dry season samples per year for water and sediment toxicity and sediment chemistry. An additional three wet-weather water samples, analyzed for toxicity and pesticides, are required once during the permit term if collected as part of a regional RMC effort.[2]

C.1 WY 2025 Results

In July 2025, dry season Pesticides and Toxicity monitoring was conducted at the same locations on Stevens and San Tomas Aquino Creeks that have been targeted since WY 2016.

- Water Toxicity. In the San Tomas Aquino Creek sample, statistically significant toxicity was observed for *Ceriodaphnia dubia* (reproduction), *Chironomus dilutus* (survival), and *Selenastrum capricornutum* (growth). The *C. dubia* reproduction test exhibited a Percent Effect of 56%, which triggered a follow-up sample. All other endpoints were below the follow-up threshold of 50%. The September 2025 sample was also significantly toxic to *C. dubia* (reproduction) with a Percent Effect of 20%.

  In the Stevens Creek sample, statistically significant toxicity was observed for *C. dubia* (reproduction), *Pimephales promelas* (growth), and *S. capricornutum* (growth). The S. capricornutum growth test exhibited a Percent Effect of 72%, which triggered a follow-

[2] In WY 2023, SCVURPPP satisfied MRP 3.0 wet weather monitoring requirements by collecting three wet weather water samples (Stevens Creek, San Tomas Aquino Creek, and Guadalupe River) as part of a regionally coordinated monitoring event. These data were reported in the WY 2023 UCMR.

up sample. All other endpoints were below the follow-up threshold of 50%. Toxicity to *S. capricornutum* was not observed in the September 2025 sample.

- Sediment Toxicity. In the San Tomas Aquino Creek sample, statistically significant toxicity was observed for both tests (*C. dilutus* survival and *Hyalella azteca* survival); however, neither test exceeded the follow-up threshold of 50% and no toxicity was observed in the Stevens Creek sediment sample.
- Sediment Chemistry. Pesticide concentrations in the WY 2025 dry season sediment samples were low, with no total organic carbon (TOC) normalized concentrations of individual pyrethroids found to be over one toxic unit (TU) equivalent. The sum of the TU equivalents calculated for pyrethroid pesticides was 0.57 for the San Tomas Creek sample and 0.28 for the Stevens Creek sample. Fipronil and its degradants were all below the method detection limit (MDL).

  As in many previous years, serpentine associated metals (chromium and nickel) concentrations were above the highly conservative Threshold Effect Concentrations (TECs) in both creek samples. In addition, copper concentrations were above the TEC in both creek samples, and zinc concentrations were above the TEC in the San Tomas Aquino Creek sample. Only nickel in the Stevens Creek sample was above the Probable Effect Concentration (PEC).[3]

In accordance with MRP requirements, a comprehensive QA/QC program was implemented by SCVURPPP covering all aspects of Pesticides and Toxicity monitoring was conducted during WY 2025. Overall, the results of the QA/QC review suggest that the majority of the data generated during WY 2025 were of sufficient quality for the purposes of this program. For the first time in SCVURPPP monitoring history, statistically significant toxicity to *S. capricornutum* was observed. Because similar anomalous results were reported by other RMC programs, the *S. capricornutum* results were flagged as “questionable data” by the QA officer.

C.2 WY 2016 through WY 2025 Data Summary

The results of pesticides and toxicity monitoring conducted in San Tomas Aquino and Stevens Creek during WY 2016 through WY 2025 were analyzed to identify temporal trends. Wet weather results from samples collected during WY 2018 and WY 2023 are also summarized. The data provide a reference to inform management decisions regarding water quality improvement in Santa Clara County watersheds and inform future monitoring recommendations.

- ***H. azteca.*** Toxicity to *H. azteca* (survival), a test organism known to be sensitive to pyrethroid pesticides, was observed was observed intermittently in dry-season sediment samples from San Tomas Aquino Creek in WY 2022, WY 2023, and WY 2025 (but never in Stevens Creek sediment samples). In all cases, Percent Effect values were below the MRP follow-up threshold of 50%. The cause of this toxicity remains uncertain, as the sum of pyrethroid toxic unit (TU) equivalents in corresponding sediment chemistry samples was generally below 1.0.

  In water, toxicity to *H. azteca* (survival), was observed in one dry-season sample (Stevens Creek in WY 2025), with a Percent Effect below 50%. Toxicity to *H. azteca* (survival) has also been observed in six of nine wet weather water samples collected throughout the Santa Clara Valley in WY 2018 and WY 2023.

[3] In compliance with MRP provision C.8.g.iv, metals and polyaromatic hydrocarbon (PAH) concentrations are compared to Probable and Threshold Effect Concentrations (PECs and TECs) as defined by MacDonald et al. (2000).

- ***C. dilutus.*** Of the 26 water samples analyzed (20 dry weather and 6 wet weather), six dry weather samples were significantly toxic to *C. dilutus*, a test organism known to be sensitive to neonicotinoids (e.g., imidacloprid) and fipronil; however, none of these samples had a Percent Effect greater than 50% (Table 3.3). In contrast, of the 23 dry weather sediment samples, seven (all from San Tomas Aquino Creek) were significantly toxic to *C. dilutus*, of which three had a Percent Effect greater than 50%.
- ***C. dubia****.* Of the 42 dry season samples where significant toxicity has been observed, 19 were water samples with *C. dubia* reproduction toxicity. *C. dubia* is a water flea that is sensitive to a broad range of aquatic contaminants. However, the specific cause of the chronic *C. dubia* toxicity in San Tomas Aquino Creek and Stevens Creek is unknown and not seemingly explained by the synoptic sediment chemistry results. It is possible that the chronic *C. dubia* toxicity observed in water samples are false positives resulting from inconsistencies in laboratory QA procedures. Statewide, there have been other reports of unexplained chronic *C. dubia* toxicity. The Southern California Coastal Water Research Project (SCCWRP) examined this issue and recommended guidance for laboratory best practices, accreditation, and training to reduce variability and inconsistency between lab processes (Brent et al. 2023).
- **Sediment Chemistry.** Between WY 2016 and WY 2025, no sediment samples in San Tomas Aquino or Stevens Creeks exhibited PEC quotients greater than 1.0 for analytes other than chromium and nickel, which are naturally elevated in local native soils. When chromium and nickel are excluded, a limited number of samples exhibited TEC quotients ≥ 1.0, primarily for zinc, copper, and polycyclic aromatic hydrocarbons (PAHs). These exceedances were infrequent, did not show a consistent increasing trend, and were generally not associated with concurrent sediment toxicity.
- **Context with Regional and Statewide Data.** Detection frequencies for bifenthrin and fipronil in Santa Clara County are comparable to those reported in California Department of Pesticide Regulation (DPR) Northern California urban monitoring studies. Observed *H. azteca* toxicity responses were also consistent with results from the SWAMP Stream Pollution Trends (SPoT) monitoring program in nearby watersheds, suggesting that observed conditions are not unique to the monitored creeks.

C.3 Recommendations for Pesticides and Toxicity Monitoring in MRP 3.0 and MRP 4.0

Pesticides & Toxicity monitoring conducted under provision C.8.g has generated a robust long-term dataset. In WY 2026 and through the MRP 3.0 permit term, SCVURPPP will continue to sample San Tomas Aquino and Stevens Creeks for dry weather Pesticides & Toxicity Monitoring requirements.

The Program also supports continuation of Pesticides & Toxicity monitoring into MRP 4.0. However, evaluation of monitoring results from WY 2016 through WY 2025 indicates that certain toxicity endpoints provide limited additional management insight relative to their cost. Specifically, the Program recommends removing *C. dubia* (reproduction), *P. promelas* (survival and growth), and *S. capricornutum* (growth) from the list of required toxicity tests under MRP 4.0. Collectively, these endpoints have demonstrated limited utility for informing management actions in Santa Clara County. Chronic *C. dubia* reproduction toxicity, while frequently observed, is subject to substantial interlaboratory variability and an elevated risk of false-positive results, reducing its interpretive value. Toxicity to *P. promelas* has been rarely observed and is typically associated with pathogen related mortality rather than ambient water quality

stressors. Toxicity to *S. capricornutum* has been observed only once during the Program's monitoring history and occurred concurrently across multiple regional programs, suggesting non-ambient causes. Eliminating these tests would result in meaningful cost savings while retaining a core set of toxicity endpoints (*C. dilutus*, *H. azteca*, and acute *C. dubia*) that continue to provide relevant information on sediment- and water-associated contaminants.

Part D: Pollutants of Concern Monitoring

Part D of the IMR presents Pollutants of Concern (POC) monitoring conducted pursuant to Provision C.8.f during WY 2020 through WY 2025. Monitoring addressed six Management Questions (MQs): source identification (MQ#1); contributions to Bay impairment (MQ#2); management action effectiveness (MQ#3); loads and status (MQ#4); trends (MQ#5); and compliance with Receiving Water Limitations (RWLs; MQ#6). Many of these MQs provide information to support implementation of Total Maximum Daily Load (TMDL) water quality restoration plans. Pollutants monitored include polychlorinated biphenyls (PCBs), mercury, copper, and emerging contaminants. Monitoring was conducted primarily through SCVURPPP-led sediment and stormwater sampling, with regional datasets from the RMP and the SWAMP SPoT monitoring program used, where appropriate, to provide context.

D.1 PCBs, Mercury, Copper, and Emerging Contaminants Monitoring (Management Questions 1 through 5)

Between WY 2020 and WY 2025, SCVURPPP collected sediment and stormwater samples to address Management Questions 1 through 5. Sampling focused on urban source areas, MS4 sediments, stormwater runoff, LID facility effluent, and downstream receiving waters.

Source identification sampling was conducted annually to identify and confirm areas with elevated PCBs and mercury concentrations. During WY 2025, 76 sediment samples were collected from streets, catch basins, manholes, and select on-site locations. Total PCBs concentrations ranged from 0.003 to 4.96 mg/kg dry weight, and total mercury ranged from 0.03 to 1.37 mg/kg dry weight. A small number of samples exceeded the Program's moderate and high source screening thresholds of, respectively, 0.2 and 1.0 mg/kg for PCBs and 0.3 and 1.0 mg/kg for mercury. Additional analysis of these data, along with prior data collected in these areas, will be presented in the Mercury and PCBs Control Measures Report, which will be submitted with the Program's Annual Report on September 30, 2026.

Stormwater sampling conducted to address Loads and Status and Trends included monitoring of treated effluent from the TCM6 bioretention facility, and stormwater from receiving waters and MS4 infrastructure. Total PCBs concentrations in LID effluent ranged from 0.17 to 0.41 ng/L, and total mercury ranged from 3.5 to 9.5 ng/L during WY 2025. Total PCBs concentrations in stormwater collected from MS4 infrastructure and receiving waters ranged from 0.3 to 54 ng/L and total mercury ranged from 2.1 to 44 ng/L during WY 2020 – WY 2025. Concentrations observed during WY 2020 – WY 2025 exhibited event-to-event variability typical of urban runoff but were generally within the range of historical data collected in the Santa Clara Valley. No clear upward trends in PCB or mercury concentrations were identified over the six-year period.

Copper monitoring conducted to address Loads and Status requirements did not indicate widespread or persistent exceedances of applicable WQOs under monitored conditions. Emerging contaminant monitoring requirements were met through direct financial contributions to the RMP's Emerging Contaminants Monitoring Strategy.

Overall, monitoring conducted between WY 2020 and WY 2025 met or exceeded the minimum MRP sample requirements for PCBs, mercury, copper, and emerging contaminants and provided sufficient data to address Management Questions 1 through 5.

D.2 Receiving Water Limitations Monitoring (Management Question 6)

Management Question 6 addresses compliance with applicable Receiving Water Limitations. RWL monitoring during the MRP 3.0 term was conducted on a regional basis under an approved monitoring plan (BAMSC 2023). In the Santa Clara Valley, receiving water sampling was conducted at Saratoga Creek during four wet season events and one dry season event.

Analytes included fecal indicator bacteria, nutrients, dissolved metals, total mercury, PCBs, polycyclic aromatic hydrocarbons (PAHs), and supporting field parameters. Results indicate that fecal indicator bacteria frequently exceeded applicable WQOs during wet weather conditions. In contrast, dissolved metals, total mercury, PCBs, and PAHs were generally within applicable objectives and consistent with historical variability for urban creeks in the region. A single exceedance of a hardness-based dissolved copper objective was observed during a wet season event.

The updated regional RWL assessment concludes that monitored sites are generally representative of urban receiving waters and that, aside from bacteria, most analytes were within the range of historical conditions. Continued evaluation of RWL monitoring design and analyte selection will be important in future permit terms to ensure that monitoring remains focused on constituents with reasonable potential to approach or exceed applicable objectives.

D.3 Recommendations for POC Monitoring under MRP 4.0

Based on monitoring conducted during WY 2020 through WY 2025, SCVURPPP recommends retaining the core POC monitoring framework in MRP 4.0, with refinements to improve efficiency and alignment with management objectives.

For Management Questions 1 through 5, continued emphasis on identifying and controlling localized PCBs and mercury source areas is appropriate. Data collected during WY 2020 through WY 2025 confirm that elevated concentrations are limited and site-specific rather than widespread. Providing flexibility in how samples are allocated among Management Questions would allow the Program to focus monitoring on higher-priority source areas and emerging implementation needs, where it provides the greatest management value.

For Management Question 6, continuation of a coordinated regional RWL monitoring program is recommended, with potential refinements to analyte lists and sampling frequency. Monitoring during WY 2023 through WY 2025 indicates that fecal indicator bacteria remain the parameter that is most consistently above objectives, while metals and legacy organic pollutants are rarely elevated under monitored conditions. Future RWL monitoring should prioritize constituents with a demonstrated likelihood of elevated levels and avoid duplication of information generated through other monitoring programs.

Overall, the WY 2020 through WY 2025 dataset indicates that PCB, mercury, and dissolved metal concentrations in sediment and stormwater remain within the range of historical variability, with localized source areas continuing to be the primary driver of elevated results. Continued focused source control, stormwater treatment implementation, and targeted monitoring will remain the most effective approach for supporting TMDL implementation and protecting beneficial uses in Santa Clara Valley receiving waters.

Part E: MRP Provision C.8 Budget Summary

Part E of the IMR provides a budget summary for Provision C.8 monitoring activities conducted by the Program on behalf of Santa Clara County Co-permittees. In accordance with the requirements of Provision C.8.h.v(4) of MRP 3.0, this report summarizes the approximate budget expended by the Program "for each monitoring requirement (for each year of the Permit term)" during Fiscal Years (FYs) 2019-20 through 2025-26, a seven-year period consistent with WY 2020 through WY 2026.

Over this period, the Program expended approximately $9.3 million to implement Provision C.8 monitoring requirements under MRP 2.0 and MRP 3.0. Monitoring costs increased substantially with the transition to MRP 3.0, reflecting the replacement of Creek Status Monitoring and Stressor/Source Identification (SSID) with new program elements, i.e., LID effectiveness monitoring and trash monitoring. As a result, monitoring now represents a larger share of overall Program expenditures, reducing the proportion of resources available for Program support of all other MRP provisions, including implementation of control measures that directly reduce pollutant impacts.

Budget distribution during a representative MRP 3.0 year (FY 2024-25) illustrates the relative cost of individual monitoring elements. LID monitoring accounted for approximately 23% of the total Provision C.8 budget, making it the most resource-intensive component. Trash monitoring represented approximately 22% of total costs, with a substantial portion supported by the EPA-funded Watching Our Watersheds (WOW) project. While grant funding helped offset some costs during MRP 3.0, these funding sources are not expected to be stable or available in future permit terms.

Table E-1 summarizes the results of a qualitative cost-benefit evaluation of Provision C.8 monitoring elements, comparing the relative cost of each program component with its ability to address management questions. This evaluation informed SCVURPPP's recommendations for water quality monitoring under MRP 4.0, which are summarized in Table E-1 and described in greater detail in IMR Parts A (LID Monitoring), B1 (Trash Outfall Monitoring), B2 (Trash Receiving Water Monitoring), C (Pesticides and Toxicity Monitoring), and D (Pollutants of Concern Monitoring).

Table E-1. Qualitative cost-benefit evaluation of MRP 3.0 Provision C.8 water quality monitoring.

MRP 3.0 Subprovision		Relative Costs of Implementing ($ - $$$$) [a]	Relative Benefit Towards Answering Core Management Questions (★-★★★★)	Evaluation Summary
C.8.a	Compliance Options	$$	★★★	This component includes participation in BAMSC MPC Subcommittee and RMC, monitoring program planning, management, and oversight. Coordination on a regional level is useful for both planning, information sharing and ensuring efficiency and thoroughness.
C.8.b	Data Management & QA/QC	$$	★★★★	Proper QA/QC is critical for ensuring the data collected are trustworthy and representative of actual conditions.
C.8.c	San Francisco Bay Estuary Receiving Water Monitoring (RMP)	$$$$	★★★	Contributions to the RMP have provided useful information on the status and trends of water quality in the Bay and provided supplemental information to help SCVURPPP continue to identify and refine PCBs and mercury source areas for management actions. Attempts to focus RMP-led monitoring on high priority issues remains an on-going challenge due to competing interests and information needs. Overall, the RMP provides useful information to track water quality conditions in the Bay and helps inform broad-scale management and policy directions based on science, but at a relatively high cost.
C.8.d	Low Impact Development (LID) Monitoring	$$$$	★★★	At 23% of the total monitoring budget in FY 24–25, LID monitoring is the most resource-intensive Provision C.8 element. LID monitoring useful information confirming the effectiveness of LID (e.g., bioretention) facilities for stormwater treatment (Management Question #1). However, site modifications required to support monitoring limit the Program's ability to evaluate minimum operations and maintenance needs (Management Question #2), which are more directly informed through MRP Provision C.21 (Asset Management). While interest in long-term performance trends at targeted facilities supports continued LID monitoring, the relatively high costs indicate that refinements to the monitoring approach and Management Questions are needed to improve cost-effectiveness under MRP 4.0.
C.8.e	Trash Outfall Monitoring	$$	★★★	At 10% of the total monitoring budget in FY 24-25, Trash Outfall Monitoring has provided regionally consistent data to address MRP 3.0 Management Questions related to the effectiveness of trash control measures in MS4 catchments controlled to low trash generation levels. Early results indicate generally low trash loading rates at monitored outfalls, supporting conclusions that existing trash management actions are largely effective. However, the monitoring approach is resource-intensive and subject to logistical constraints, including equipment failure, vandalism, and limited site suitability. Recommendations for MRP 4.0 include refining storm selection criteria, reducing or eliminating trash characterization, and increasing flexibility in monitoring requirements to improve cost-effectiveness.
C.8.e	Trash Receiving Water Monitoring	$$$	★	Trash receiving water (RW) monitoring was implemented as a regionwide pilot study under MRP 3.0 and is funded almost entirely through the WOW project grant. If funded by SCVURPPP, this monitoring would account for approximately 12% of the total monitoring budget. The program was designed to address Management Question #2 by evaluating whether trash discharges from areas controlled to low trash generation levels contribute to adverse receiving water impacts. While the first year of monitoring produced scientifically robust data and demonstrated trash loading rates below the low trash generation threshold, the results have limited utility for directly informing management decisions or distinguishing the effectiveness of individual trash control measures. Given the high resource demands, reliance on external (and unreliable) grant funding, and limited ability to meaningfully answer the Management Questions, the pilot has met its intended objectives and continuation of Trash RW monitoring under MRP 4.0 is not recommended.
C.8.f	Pollutants of Concern (POC) Monitoring	$$$	★★★	Monitoring conducted under provision C.8.f provides valuable data on potential sources of POCs, supporting prioritization of areas for ongoing source property identification and other PCBs and mercury controls. The Receiving Water Limitations (RWL) monitoring component provided a regionally consistent dataset for comparisons with applicable water quality standards, and direct contributions to the RMPs Emerging Contaminants (ECs) Strategy represent an efficient mechanism for addressing this complex suite of ECs. Although POC monitoring has relatively high costs, the data collected address multiple core management questions and informed management actions. The PCBs Special Studies EPA grant, while primarily supporting provision C.11/12 objectives, also contributed to meeting provision C.8.f minimum monitoring requirements during MRP 3.0; however, future availability of grant funding is uncertain. Accordingly, the Program recommends continuing POC monitoring under MRP 4.0 with targeted refinements to improve cost-effectiveness and emphasize source identification, regional coordination, and efficient use of third-party and regional monitoring programs.
C.8.g	Pesticides and Toxicity Monitoring	$	★★	There were relatively low costs expended by the Program for Pesticides and Toxicity Monitoring during MRP 3.0. Data collected via the statewide SPoT program provide important information on pesticide and toxicity trends in stream sediments and help supplement key data needs. While the relatively low costs are favorable, the moderate management benefits indicate that refinements are needed to improve the cost-effectiveness of monitoring under provision C.8.g in MRP 4.0. A statewide effort to develop an Urban Pesticide Coordinated Monitoring Program is currently underway, and the Program is actively participating in this process. For SCVURPPP, the goal is to stabilize costs for pesticides and toxicity monitoring, while enhancing coordination of data collection efforts statewide with the California Department of Pesticide Regulation (DPR) to fill critical information gaps that will improve the regulation of pesticides that effect stormwater quality.
NA	NPDES Surcharge - Surface Water Ambient Monitoring Program	$	★	From a local program perspective, the NPDES SWAMP surcharge represented a relatively small portion of the overall monitoring budget; however, the benefits to local stormwater programs and managers were not readily apparent.

[a] Qualitative cost categories were based on the relative percentage of total costs for each major monitoring component shown above. Cost categories were defined as: $ = <5%, $$ = 5 - 10%; $$$ = 10 - 15%; $$$$ = >15% based on FY 2024-25 budgets, which represent a representative year of MRP 3.0 monitoring (i.e., no major planning efforts, and no IMR development).

References

BAMSC (Bay Area Municipal Stormwater Collaborative). 2023. Receiving Water Limitations Assessment Report - Receiving Water Limitations Monitoring Plan. Submitted by Alameda Countywide Clean Water Program (ACCWP), Contra Costa Clean Water Program (CCCWP), Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP), San Mateo Countywide Water Pollution Prevention Program (SMCWPPP). March 14, 2023.

BAMSC. 2025. Quality Assurance Project Plan. Municipal Regional Stormwater Permit No. CAS612008. Order No. R2-2022-0018. Low Impact Development Monitoring. Prepared on behalf of Alameda Countywide Clean Water Program, Contra Costa Clean Water Program, San Mateo Countywide Water Pollution Prevention Program, Santa Clara Valley Urban Runoff Pollution Prevention Program, Solano Stormwater Alliance. Version 2.0. August 15, 2025.

Brent, R., Bailey, H., Norberg-King, T., Van der Vliet, L., and Bailer, A.J. 2023. *Ceriodaphnia dubia Quality Assurance Guidance Recommendations*. Technical Report 1341. Prepared by the Southern California Coastal Water Research Project (SCCWRP) for the State Water Resources Control Board (SWRCB) and the California Association of Sanitation Agencies (CASA). 54 p + appendices.

MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000. *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems*. Arch. Environ. Contam. Toxicol. 39, 20-31.

SCVURPPP (Santa Clara Valley Urban Runoff Pollution Prevention Program). 2020. Integrated Monitoring Report. Water Year 2014 through Water Year 2019. March 31, 2020.

SCVURPPP. 2024. Revised Low Impact Development (LID) Monitoring Plan for Santa Clara County During MRP 3.0. Prepared by EOA, Inc. October 31, 2024.

Part A: Low Impact Development (LID) Monitoring Status Report

Part B1: Trash Outfall Monitoring Progress Report

Part B2: Trash Receiving Water Monitoring Progress Report

Part C: Pesticides & Toxicity Monitoring Status Report

Part D: Pollutants of Concern Monitoring Report

Part E: MRP Provision C.8 Budget Summary